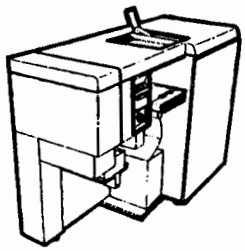
CE PREVENTIVE MAINTENANCE CHECKLIST

(part number 02682-90938 Mar 85)



Serial No. _____

Date _____

Rotation Count _____

CE _____

Run Self Test

Display Errorlogs - **PM 1**
- ☐ DCS Messages (619 ENTER)
- ☐ Failure Messages (651 ENTER)

(Checks from the rear of the printer.)

☐ Elevator Drive Belt Tension - **PM 2**

☐ Lubricate Leadscrew - **PM 2**

☐ Replace Preheater Filter - **PM 3**
(P/N 02682-00389)

Vacuum System Checks (701 ENTER) - **PM 4**
- ☐ Vacuum Bag Input _____
- ☐ Separator/Sensor Hose _____
- ☐ Preheater Valve _____

☐ Clean the Power Supply Filter - **PM 5**

☐ Clean the Cardcage Filter - **PM 5**

Fan/Blower Operation (776 ENTER) - **PM 6**
- ☐ PAMM Blower
- ☐ PAMM Fans (2)
- ☐ Fuser Fan
- ☐ Cardcage Fans (2)
- ☐ DC Power Supplies Fans (2)

(Disconnect the Drum Heater Connector)

☐ Retraction Solenoid Inspection - **PM 7**
(752 ENTER RUN)

☐ ESM Solenoid Inspection - **PM 8**

☐ ESM Coupling Shaft - **PM 9**

☐ Start Tension (270 ENTER) - **PM 10**

☐ Run Tension (272 ENTER) - **PM 10**

☐ Tension Motor Speed Check - **PM 11**

☐ Tension Motor Belt Inspection - **PM 11**

☐ Tension System Pulleys - **PM 11**

☐ AC Line Voltage Checks - **PM 12**
(1196 ENTER)

DC Power Supply Voltages - **PM 13**
- ☐ +12 Vdc
- ☐ -12 Vdc
- ☐ +5 Vdc
- ☐ +28 Vdc

(Checks from the front of the printer)

☐ Replace Vacuum Bag (02682-00305) - **PM 14**

☐ Inspect Vacuum Door Seals - **PM 15**

☐ Replace PAMM Filter (02682-00388) - **PM 16**

(Set MAIN Breaker OFF)

☐ Inspect Fuser Endblocks - **PM 17**

☐ Inspect Fuser Bulb - **PM 18**

☐ Inspect Preheater - **PM 19**

(Set MAIN Breaker ON)

Output Tractors Inspection - **PM 20**
- ☐ Grit Wheels
- ☐ Pinwheels (pins)
- ☐ Hinged Gates
- ☐ Stripper Fingers
- ☐ Tensile Strip

☐ Output Static Tensile Strip - **PM 21**

☐ Flapper Box Fingers Inspection - **PM 22**

☐ Paper Sensor Inspection - **PM 23**

Chainbox Inspection - **PM 24**
- ☐ Guides and Rails
- ☐ Drive Sprockets
- ☐ Chains

☐ Lubricate Chains (use Vactra No. 2) - **PM 25**

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Input Tractor Inspection - **PM 26**
- ☐ Locking Levers
- ☐ Belts and Pins
- ☐ Paper Out Sensor

(Enable the High Voltage System (676 Enter) and Open the Front Door. Remove the ESM Assembly, Developer Assembly, Corona Assemblies, and Drum.)

Toner Hopper Maintenance - **PM 28**
- ☐ Lubricate Geartrain
- ☐ Verify shaft Hopper Low switch action

Developer Top Seal Inspection - **PM 29**
- ☐ Roller Wear
- ☐ Top Seal Spring Tension
- ☐ Mylar Seal Wear

☐ Lubricate Developer Drive Gears - **PM 30**
(use Moly-Cote G)

☐ Verify Magnet Angle Polarity - **PM 31**

☐ Clean EP Purge Filter - **PM 32**

☐ Inspect ESM Assembly Coupling - **PM 33**

Inspect ESM Assembly - **PM 34**
- ☐ Overall Inspection
- ☐ Clean Sensor
- ☐ Verify Door Tension

☐ Inspect Erase/Overall Illumination Lamps - **PM 35**

☐ Verify Drum-Roll-Spacing - **PM 36**

☐ Inspect/Lubricate Drum Drive Gears - **PM 37**
(Use Moly-Cote G)

(Remove the EP Closeout Panel)

☐ Clean the Densitometer - **PM38**

☐ Densitometer Offset Adjustment - **PM 39**
(644, ENTER, RUN)

☐ Clean the EP Area - **PM 40**

☐ Clean the EL Strip - **PM 41**

Retraction Brush Maintenance - **PM 42**
- ☐ Resistance Check (6 to 52 Kohms)
- ☐ Inspect for Wear
- ☐ Inspect Ground Wire

☐ Retraction Blade Adjustment - **PM 43**
(752, ENTER, RUN, HALT)

Corona Rail Inspection - **PM 44**
- ☐ Primary
- ☐ Simultaneous
- ☐ Transfer

☐ Primary Corona Rail Resistance - **PM 45**
(less than 7 MegOhms)

☐ Primary Corona Screen Inspection - **PM 46**

☐ Simultaneous Corona Grid Inspection - **PM 47**

Corona Assembly Inspection - **PM 48**
- ☐ Cleanliness
- ☐ Loose Wires
- ☐ Endball Resistence (100 Kohms)
- ☐ Endcaps

High Voltage Cable Inspection - **PM 49**
- ☐ Simultaneous
- ☐ Primary
- ☐ Transfer

Cleaner Station Maintenance - **PM 50**
- ☐ Input Connector Seal
- ☐ Assembly Wiper Blade Seal

(Install the Drum, Electrostatic Monitor, Developer Assembly, and Corona Assemblies.)

(Leave front door open.)

☐ Developer Bias Check - **PM 51**
(736, ENTER, RUN - 302 Vdc +/- 10 Vdc)

☐ Cleaner Blade Tension Check - **PM 52**
(1000 grams tension)

(Reconnect the Drum Heater)
(Close the printer front door)

Self Test - **PM 53**
- ☐ Clean Drum Routine
(326, ENTER, 1, ENTER, 1 ENTER, RUN, 1225)

☐ Densitometer Gain Adjustment
(326, ENTER, 500, ENTER, 1 ENTER, RUN)

(Reinstall EP closeout panel)

- ☐ First Order Beam (90 Counts +/- 10)
- ☐ ESM Voltage and Door Voltage (+/- 2)
- ☐ Primary Corona (190 +/- 10)
- ☐ Simultaneous Corona (80 +/- 10)
- ☐ Dark Potentials (within +/- 10)
- ☐ Light Potentials (within +/- 10)
- ☐ Overall Print Quality Check
- ☐ Fusing Check

(Two Million Rotation PM)

☐ Vacuum Blower Belt Tension - **PM 54**
(Deflection 6mm)

☐ Vacuum Hose Inspection - **PM 55**

☐ PAMM Blower Vane Cleaning - **PM 56**

☐ PAMM Blower Hose Inspection - **PM 56**

☐ Developer Doctor Blade Adjustment - **PM 57**

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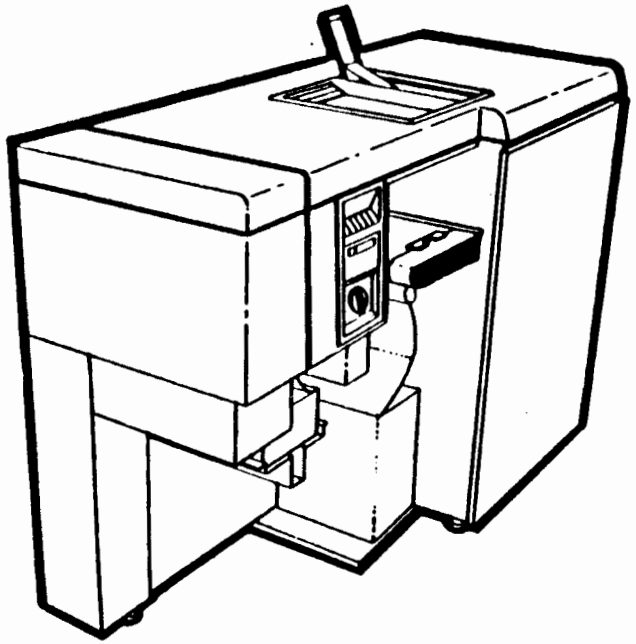
NEW PM PROCEDURE

RANGE WITH VDP= 100K TO 150K ROTATIONS, WITHOUT VDP= 150K TO 200K ROTATIONS

PM 1	PM 2	PM 3	PM 4	PM 5	PM 6
DEVELOPER	DEVELOPER DRUM	DEVELOPER FILTERS	DEVELOPER DRUM	DEVELOPER	DEVELOPER DRUM MAJOR PM 1.2 MILLION

PM 7	PM 8	PM 9	PM 10	PM 11	PM 12
DEVELOPER	DEVELOPER DRUM	DEVELOPER FILTERS	DEVELOPER DRUM	DEVELOPER	DEVELOPER DRUM MAJOR PM 2.4 MILLION

2680A
PREVENTIVE MAINTENANCE SERVICE GUIDE



P/N 02682-90937

MAR 85

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MISCELLANEOUS PARTS LISTING

TION

0A Preventive Maintenance Service Guide is to be used anion document to the HP 2680A Service Manual. As such ie only provides a brief overview of the preventive nce routines. Refer to your Service Manual for detailed .ions of the preventive maintenance procedures.

HP 2680A Maintenance Philosophy

Preventive maintenance of the HP 2680A printer is divided into three classifications:

Operator Maintenance
Qualified Operator Maintenance
Customer Engineer PM

This document lists the Customer Engineer preventive maintenance duties. The following is a brief explanation of the two levels of Operator preventive maintenance:

Operator Maintenance

1. General cleaning
2. Corona cleaning
3. Disposal bottle replacement
4. Adding carrier
5. Adding toner
6. Splicing paper
7. Adjusting the vacuum valve
8. Clearing paper jams
9. Paper Tension (start and run)

Qualified Operator Maintenance

1. All Operator Maintenance
2. Drum replacement
3. Cleaner Blade replacement
4. Cleaner Blade tension
5. Developer Mixture changing
6. Magnet Angle alignment
7. New Drum routine
8. Dark Target setting
9. Erase and Illumination lamp replacement

Customers may choose to restring their corona assemblies to expedite printer operation, rather than to wait for an HP customer engineer to arrive on the site.

Maintenance Strategy

The standard maintenance agreement requires that duties of the Qualified Operator be performed by the customer. The customer is required to purchase all consumable items (i.e., drum, developer mixture, lamps, etc ...). If the customer does not wish to perform the Qualified Operator maintenance duties, he may purchase the "U2X" (for standard density printing) or the "U3X" (for variable density printing) maintenance options. When a customer purchases these maintenance options the PM consumable items are provided under the maintenance agreement.

Maintenance Pricing

Maintenance pricing is derived from the following formula:

Maintenance Price = Base Monthly Maintenance Cost + Usage Uplift + Maintenance Class U2X or U3X + Coverage Premium

The following intervals are used for determining the Usage Uplift (U0X), and Maintenance Class (U2X or U3X), costs.

Intervals in drum rotations				
	U21	U31	N/C	less than 125K/month
	U22	U32	U02	125k - 200K/month
	U23	U33	U03	201K - 275K/month
	U24	U34	U04	276K - 350K/month
	U25	U35	U05	351K - 500K/month
	U26	U36	U06	501K - 650K/month
	U27	U37	U07	651K - 800K/month

Use the above formula to tailoring the maintenance agreement to the needs of the customer. Refer to the following documents when evaluating your customers maintenance contract:

2680A Laser Printing System Support Plan (9/82)
2680A Service Manual (02682-90904 - 3/83)
2680A Operator's Handbook (02682-90912 - 11/82)
2680A Supplemental Support Plan for VPD (4-84)
2680A Support Update 3/82 - 2680A Service Pricing
2680A Support Update 8/84 - 2680A Customer PM
2680A Support Update 2/84 - 2680A Predictive Maintenance
2680A Service Note #2

PARTS and TOOLS REQUIRED

The following parts/tools are required for the 500K Interval Preventive Maintenance Routines:

PARTS

Preheater Filter	-	P/N 02682-00389
PAMM Filter	-	P/N 02682-00388
Vacuum Bag	-	P/N 02682-00305

TOOLS

Drum/Roll Spacing (DRS)	-	P/N 02682-60424
Retraction Blade	-	P/N 02682-20458
Vacuum Gauge	-	P/N 0101-0527
Wiper Blade/Drum Tension	-	P/N 8750-0058
Magnet Angle Alignment	-	P/N 02682-60606
Vactra No. 2 Lubricant	-	P/N 02682-60549
Moly-cote G Lubricant	-	P/N 6040-0521

An extensive list of HP 2680A parts and their associated part numbers are located in the back of this guide. It should be noted that all part numbers followed by an asterisk (*) have exchange part number which is listed on the last page of this guide.

PREVENTIVE MAINTENANCE PROCEDURES

The Customer Engineer Preventive Maintenance routines are divided into two intervals: those to be preformed every 500K drum rotations, and those to be performed every two million rotations. When performing the PM procedures, perform each procedure thoroughly. The procedures should be performed SEQUENTIALLY. Do NOT skip any of the procedures or jump around in the routines. Alway perform a printer Self Test prior to and following the preventive maintenance routines.

Most mechanical equipment failures give a visually or audio indication of their presence long before the actual failure occurs. Use your eyes, ears, and nose to become fully aware of your printer's operational condition. Always take your time, to try to PREDICT any potential failure. If any abnormal or unusual printer symptoms are indicated, thoroughly analyze the printer to determine the cause of the symptom.

PRIOR TO PERFORMING THE PREVENTIVE MAINTENANCE ROUTINES RUN SELF TEST

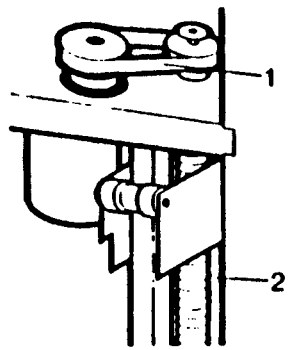
PM 1 ERROR LOG DISPLAYS

Initiate service tool command 619 (Dump DCS Memory Error Log) and record any DCS memory errors. Initiate service tool command 651 (Display Failure Message Log) record any error which may be stored in the errorlog. Service tool command 652 clears the errorlog.

PM 2 ELEVATOR LEADSCREW and DRIVE BELT

Inspect the elevator drive belt for correct tension. Examine the belt for cracks, splits, or fraying. Inspect the leadscrew; clean if necessary. Apply a few drops of oil (P/N 02682-60549 Vactra No. 2) to the leadscrew.

Figure 1. Elevator Leadscrew and Drive Belt

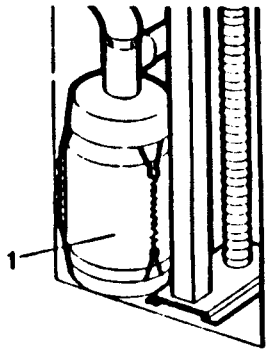


1. Check Belt Tension
2. Lightly Oil

PM 3 PREHEATER FILTER REPLACEMENT

Replace the preheater filter (P/N 02682-00389). For future reference, record the date and drum rotation count on the filter label.

Figure 2. Preheater Filter

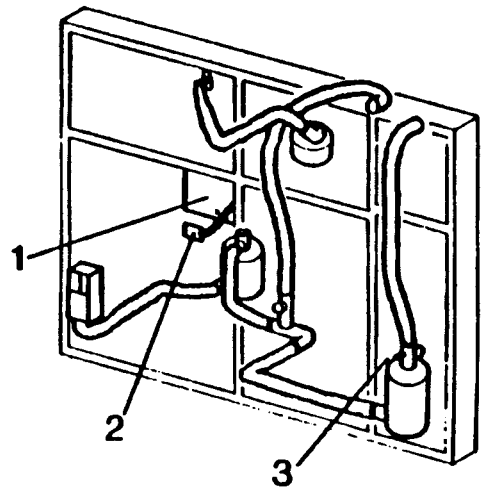


1. Replace Filter, Record Date and Rotation Count

PM 4 VACUUM SYSTEM CHECKS

Enable the Vacuum Motor (Device On Command 701) and measure the vacuum levels at the points indicated in the diagram below.

Figure 3. Vacuum Indication Testpoints

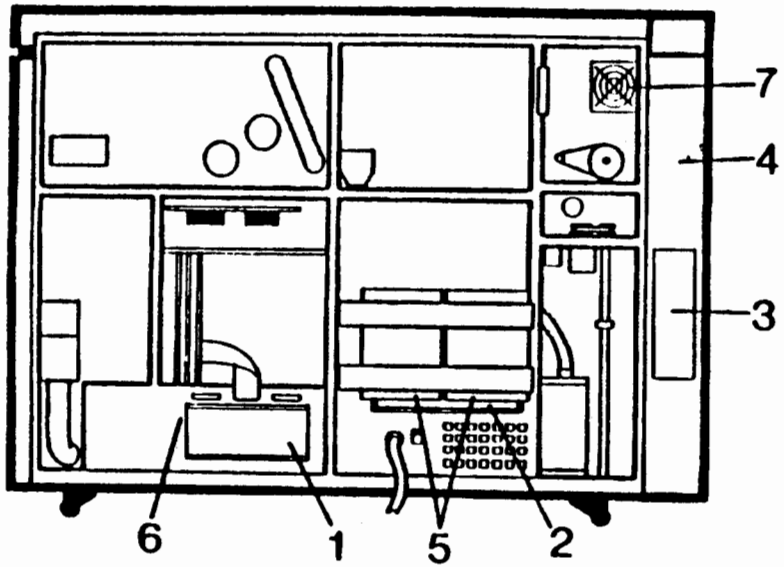


1. Vacuum Bag Input · 22-25 inches/H20
2. Separator/Sensor Hose · 18-22 inches/H20
3. Preheater Valve · 9 inches/H20 (bonded position)

PM ILTER MAINTENANCE

Cle.. the Cardcage and DC Power Supplies Filters. Replace the filters if excessively dirty or damaged.

Figure 4. Filter an Fan Locations



1. Clean Cardcage Filter
2. Clean Power Supply Filter
3. Verify PAMM Blower Operation
4. Verify PAMM Fans operation (above the Flapper Box on door)
5. Verify Power Supply Fans Operation
6. Verify Cardcage Fans Operation
7. Verify Fuser Fan Operation

PM 6 FAN/BLOWER OPERATIONAL CHECK

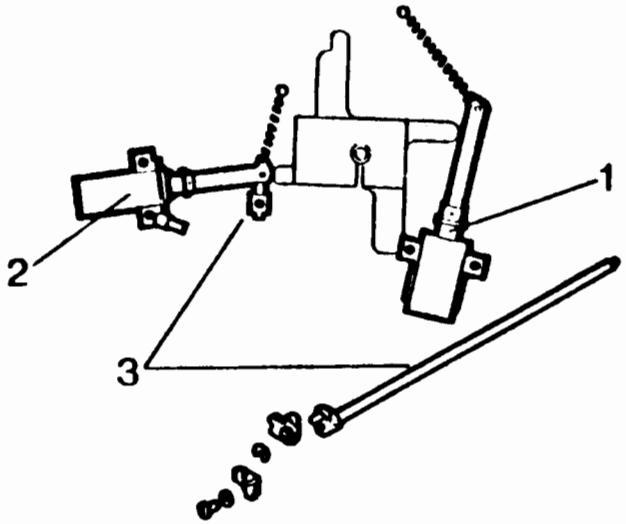
Initiate device on command 776 and verify the operation of the two PAMM fans, Fuser fan, and PAMM Blower. Note that the DC Power Supplies and Cardcage fans should be ON when the printer's front ON/OFF switch and rear Main Breaker are ON.

Disconnect the Drum Heater Connector.

PM 7 RETRACTION SOLENOID CHECKs

Inspect the retraction solenoid; check solenoid for loose linkage, bent or weak springs, or excessive wear on the green coating of the solenoid plunger body. The plunger should move freely without binding. Initiate device on command 752 ENTER RUN to engage the solenoid. The distance between the plunger shaft should be not greater than 3mm. If greater, replace solenoid.

Figure 5. ESM and Retraction Solenoids



1. Inspect Retraction Solenoid (gap no greater than 3mm).
2. Remove and Inspect ESM Solenoid
3. Remove and Clean ESM Solenoid Coupling Shaft

PM 8 ELECTROSTATIC MONITOR (ESM) SOLENOID

Remove the ESM solenoid. Inspect solenoid for excessive wear on green coating of the plunger body; replace if necessary. Clean plunger shaft with alcohol. Do NOT replace solenoid until instructed to do so.

PM 9 ELECTROSTATIC MONITOR COUPLING SHAFT

With the ESM solenoid removed, disconnect the coupling shaft tension spring and retaining finger; pull the shaft out from the rear of the printer. Clean the shaft with alcohol. If the shaft is excessively worn, replace the shaft. Do NOT reinstall the ESM shaft and solenoid until instructed to do so (procedure PM 33).

PM 10 TENSION MOTOR SPEED CHECK

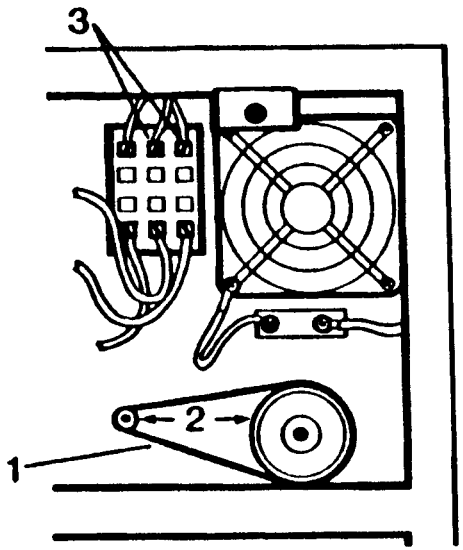
Initiate display command 270 (Display Start Tension) and verify the start tension is set to 14. Initiate display command 272 (Display Run Tension) and verify the Run Tension is set to 10.

While sing on the PAPER FORWARD key, measure the voltage at at the .ENSION MOTOR SPEED testpoint on the Control PCA. The voltage should be approximately -3.5 volts, record the measured voltage. Remove the paper from the printer, and initiate Device On command 792 (Tension Motor) to enable the motor for continuous operation. With no paper in the printer and the tension motor running, adjust the Tension Motor Speed Potentiometer to a voltage level of 1.1 times the voltage level recorded earlier (when paper was installed in the printer).

PM 11 TENSION MOTOR BELT

Examine the Tension Motor Belt for cracks, splits, or fraying. Verify that the belt is not loose. Verify that the tension motor pulleys are in good condition (no teeth missing) and that the pulleys are securely mounted to their drive shafts.

Figure 6. AC Contractor and Tension Belt



1. Check Belt tension
2. Check Pulleys
3. Measure 240 Vac (Orange and Violet wires)

PM 12 LINE VOLTAGE CHECKS

Remove the protective shield from the AC Contactor. Initiate Display Command 1196 (continuous Line Voltage Display). Using a voltmeter, measure the voltage across pins 2 and 3 of the contactor. If the displayed value does not match the measured value, adjust the Line Voltage Adjustment potentiometer on the AC Power PCA until the values are equal. Replace all covers after verification.

PM 13 DC POWER SUPPLY VOLTAGES

Measure the following dc voltage levels at the following locations:

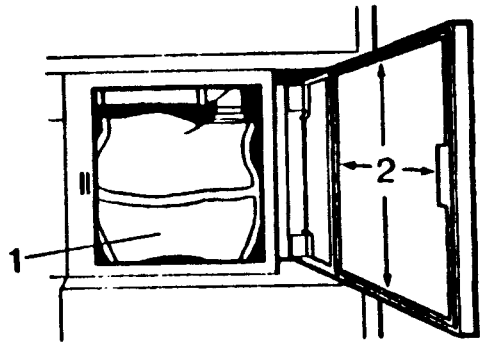
+12 Vdc +/- .1 at TP 16 on the Control PCA
-12 Vdc +/- .1 at TP14 on the Control PCA
+5 Vdc +/- .01 at TP22 on the Control PCA
+28 Vdc +/- .05 at TP6 on the Power Distribution PCA

If the measured voltages are not within their specified tolerance perform the DC Voltage Adjustments procedures in Section IV of the Service Manual.

PM 14 VACUUM BAG

Replace the vacuum bag (P/N 02682-60607). Ensure that the new vacuum bag is firmly seated to the input connector.

Figure 7. Vacuum Chamber



1. Replace Vacuum Bag
2. Check Seals

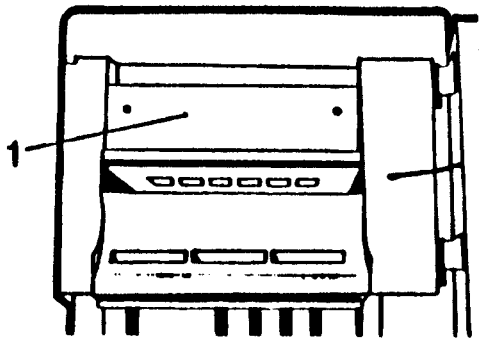
PM 15 VACUUM CHAMBER DOOR SEALS

At the front of the printer, inspect the vacuum chamber door seals. Look for any signs of vacuum leakage. Ensure the door provides a good seal to the chamber (tightly closes). Replace any damaged seals.

PM PAMM FILTER

Remove the PAMM Filter (P/N 02682-00388). For future reference, record the date and drum rotation count on the filter label.

Figure 8. PAMM Door

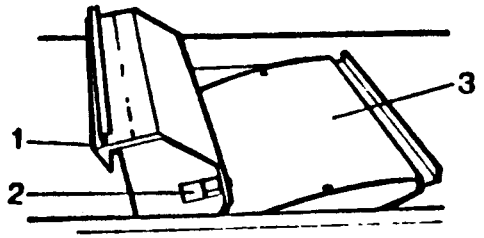


1. Replace PAMM Filter

PM 17 FUSER ENDBLOCKS

Ensure the printer's rear MAIN Breaker is set to the OFF position. Remove the fusing system cover (four screws) and lift the fusing system to the service position. Inspect the fuser end blocks for damage (pits),signs of arcing, or corrosion. Verify that the endblocks are resilient enough to securely hold the fuser bulb in position. If the endblocks show signs of heat damage or are excessively loose, replace endblocks.

Figure 9. Preheater and Fuser Assemblies



1. Inspect Fuser Bulb
2. Inspect Endblocks
3. Inspect Preheater

PM 18 FUSER BULB INSPECTION

Examine the fuser bulb for signs of gray/black tint on the glass or for any silver deposits within the bulb. Replace the bulb if any defect is detected. Observe if the bulb is dirty (toner or paper dust). Clean with alcohol if necessary.

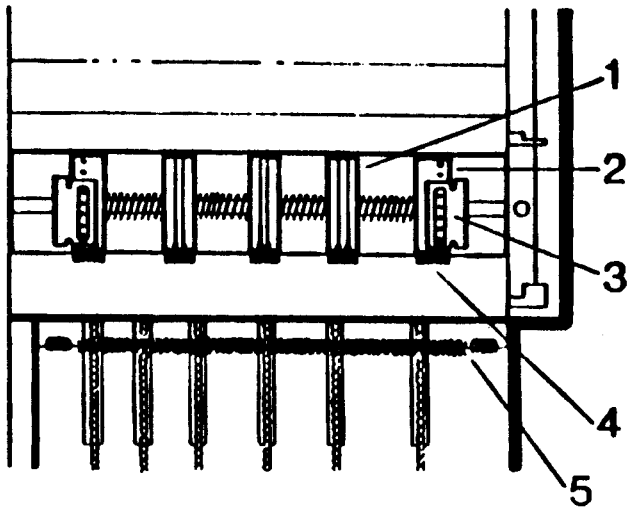
PM 19 PREHEATER INSPECTION

With the fusing system cover removed, remove the two screws which secure the preheater cover and fold open the cover. Examine the preheater surface for built up deposits of toner and/or paper dust; clean if necessary. Take care not to damage the surface of the preheater. Reinstall the fuser system cover.

PM 20 OUTPUT TRACTOR INSPECTION

Open the printer Paper Output door. Inspect the output tractors for toner build-up and excessive wear on the feed pins. Inspect the friction wheels (gritted wheels) and stripper fingers for excessive wear. Verify that the wheels rotate freely on the drive shaft. Replace all defective components.

Figure 10. Output Tractors

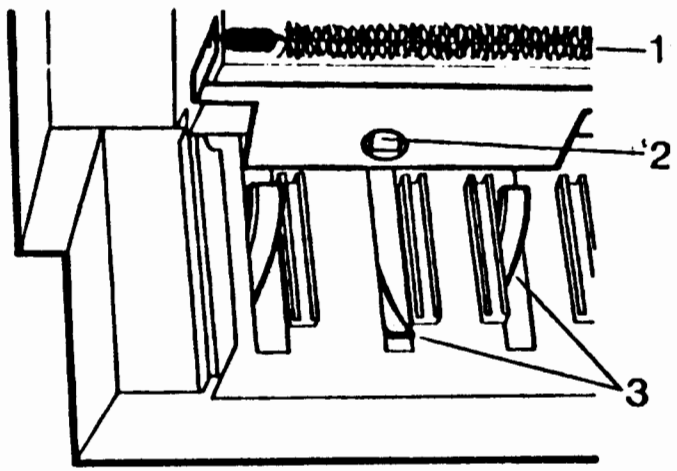


1. Inspect Grit Wheels
2. Inspect Pinwheels (pins)
3. Inspect Hinged Gates
4. Inspect Stripper Fingers
5. Inspect Tensile Strip

PM OUTPUT STATIC TENSILE INSPECTION

Inspect the two Output Static Tensile strips for damage. Replace if necessary.

Figure 11. Flapper Box



1. Inspect Tensile Strip
2. Clean Misfold Sensor
3. Inspect Flapper Fingers

PM 22 FLAPPER BOX INSPECTION

Inspect the six flapper box fingers for damage or excessive wear. Replace all defective fingers.

PM 23 PAPER SENSOR INSPECTION

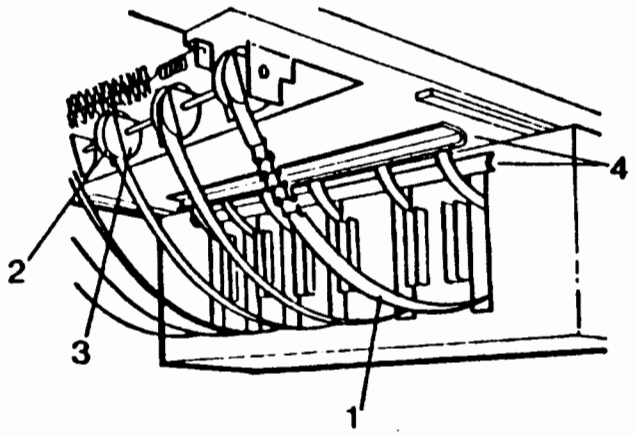
Wipe the paper sensors (Paper Out Sensor and Paper Misfold Sensor) with a non-abrasive cloth.

PM 24 CHAINBOX INSPECTION

Inspect the following items in the chain box assembly:

Plastic Guides - replace if grooves are greater than 1·2mm deep
Drive Sprockets - replace if excessively worn
Chains - replace if bent or excessively worn

Figure 12. Chain Box



1. Inspect and Lubricate the Chains
2. Inspect the Sprockets
3. Inspect the Chain Strippers
4. Inspect the Guides and Rails

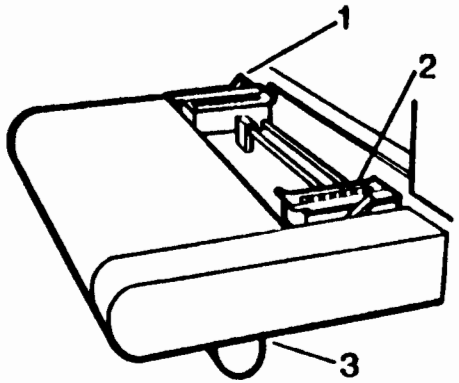
PM 25 CHAIN LUBRICATION

Apply a few drops of oil (P/N 02682-60549 - Vactra No 2) to a cloth and then lubricate the chain box paper chains while they are rotating. Apply lubricant to the non-paper surface of the chains (inner edge).

PM INPUT TRACTOR INSPECTION

Examine the input tractors for excessive wear or damage. Observe if the pins are damaged or if the belts are cracking. Verify that the rear tractor is securely held in position when the locking lever is in the locked position (i.e., the tractor does not move along its guide when locked).

Figure 13. Input Tractors



1. Inspect Locking Levers
2. Inspect Belts and Pins
3. Inspect Paper Out Sensor

PM 27 PAPER OUT SENSOR VERIFICATION

Verify that when paper is moved away from the sensor, the "Out of Paper" message is displayed.

For PM procedures 28 through 51 perform the following:

a. With power restored to the printer initiate Service Tool Command 676 (Enable High Voltage System) and open the printer front door.

b. Remove all EP printer components (Corona assemblies, Developer, Drum, and Electrostatic Monitor).

Do not reinstall the EP components until instructed.

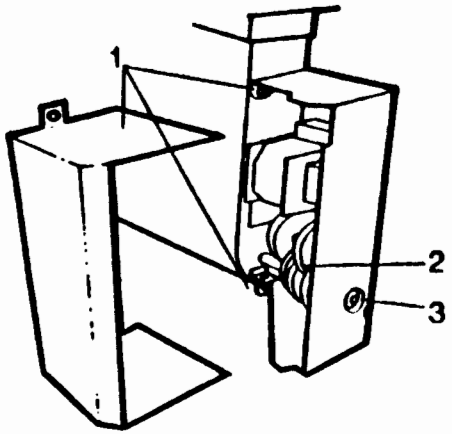
Do not power-down the printer.

Do not close the printer's front door.

PM 28 TONER HOPPER MAINTENANCE

Disconnect the toner hopper cable and remove the toner hopper from its hinges. Remove the two screws which secure the toner hopper cover. Lubricate the toner hopper gear train with Vactra No 2 (P/N 02682-60549). Inspect the toner hopper housing for any signs of toner leakage. Examine the drive gears for gear damage. Verify that the toner hopper plunger shaft is not binding by pushing on the hopper reset switch and observing if the toner hopper low switch is enabled.

Figure 14. Toner Hopper

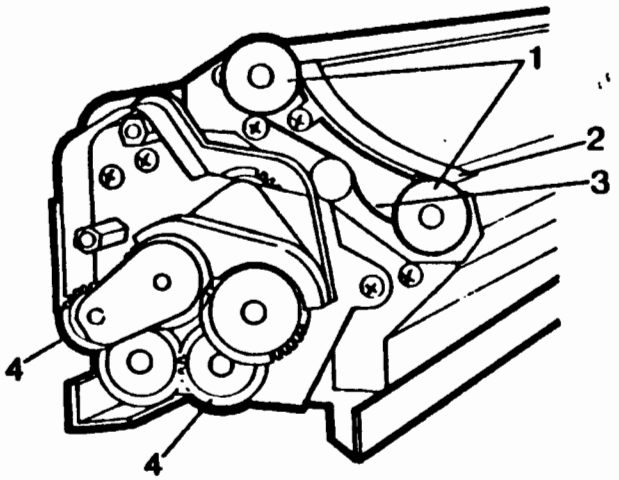


1. Remove Screws and Cover
2. Lubricate Geartrain
3. Verify Shaft and Switch Action

PM DEVELOPER TOP SEAL INSPECTION

Remove the developer assembly from the printer and remove the developer top seal from the developer assembly. Examine the top seal rollers, observe if they are cracked, crowned, or damaged. Observe if the seals have been leaking or are damaged. Observe if the top seal support spring is resilient enough hold the top seal tightly against the drum.

Figure 15. Developer Drive Gears and Top Seal



1. Inspect Top Seal Roller Wear
2. Inspect the Top Seal for wear and damage
3. Verify Spring Tension
4. Inspect for wear; Lubricate Gears

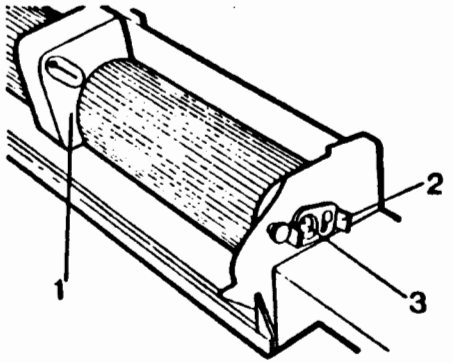
PM 30 DEVELOPER DRIVE GEAR INSPECTION

Visually inspect the developer drive gears for excessive wear, rust, or damage. Clean gears if abnormally dirty. Lubricate gears with a light coat of Moly-Cote G (P/N 6040-0521).

PM 31 DEVELOPER MAGNET ANGLE POLARIT

On the developer assembly, clear a portion of developer mixture off the developer roll large enough so that the magnet angle alignment tool may be mounted on the roll. Verify the magnet angle is correct. Verify that the polarity of the magnet angle is correct (the notch on the end of the developer roll MUST pointing up towards the drum).

Figure 16. Developer Roll (Magnet Angle Alignment)

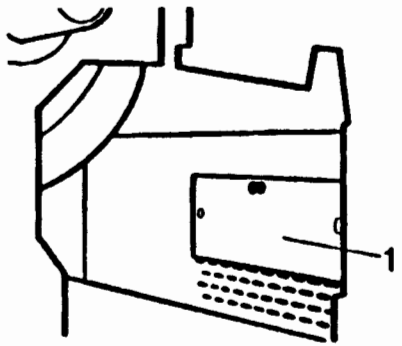


1. Verify the Magnet Angle
2. Magnet Angle Adjustment Plate
3. Magnet Roll Polarity Notch

PM 32 EP PURGE FILTER MAINTENANCE

Remove the EP Purge Filter and clean. If filter is excessively dirty, replace filter.

Figure 17. EP Purge Filter



1. Remove plate and Clean the EP Filter

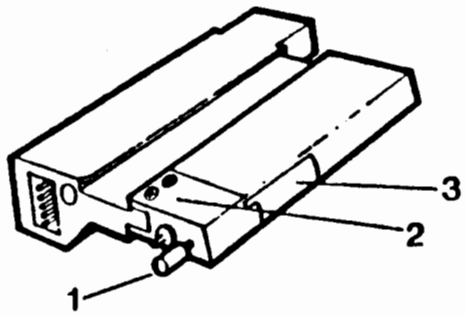
PM ELECTROSTATIC MONITOR COUPLING

Inspect the Electrostatic Monitor's Door coupling mechanism for excessive wear and cracks. Clean with alcohol if necessary. Reinstall the coupling shaft. Verify the shaft is correctly aligned so that it will mate with the ESM assembly.

CAUTION

Monitor pins are sensitive to damage from electrostatic discharge. Use protective measures when handling this assembly.

Figure 18. Electrostatic Monitor Assembly



1. Inspect ESM Coupling
2. Remove ESM Door
3. Clean Sensor

PM 34 ELECTROSTATIC MONITOR MAINTENANCE

Inspect the Electrostatic Monitor assembly for damage. Remove the one screw on the bottom of the assembly and the two screws on the top of the assembly to access the monitor door and probe. Clean the ESM door thoroughly with alcohol. Reassembly the assembly. Verify that the spring tension of the door is sufficient enough to close the door. Install the assembly prior PM 51. When installing, ensure that the shaft is correctly aligned to mate with the assembly.

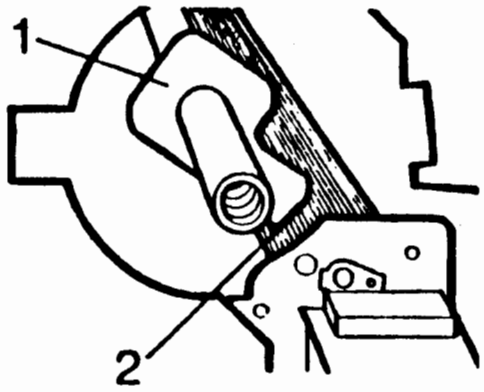
PM 35 ERASE/OVERALL ILLUMINATION LAMP

Remove the Overall Illumination and Erase Lamp assemblies. Visually inspect the assembly lamps for gray or black deposits. Clean the assemblies of any toner contamination. Replace bulbs if necessary.

PM 36 DRUM-TO-ROLL SPACING

Clear a small portion of the developer mixture off the developer roll; large enough so that the Drum-to-Roll gap may be measured. Adjust the spacing if necessary. Clean the drum shaft. Warning: the drum shaft may be hot.

Figure 19. Drum Roll Spacing (Endbell removed for clarity)

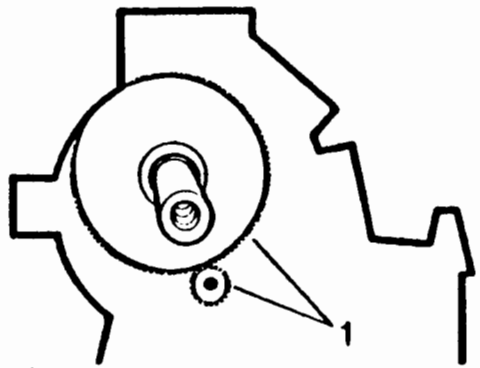


1. DRS Spacing Tool
2. Measure gap; Adjust if necessary

PM 37 DRUM DRIVE GEAR MAINTENANCE

Inspect the drum drive gears for wear and damage. Lubricate the gear faces with Molycote G (P/N 6040-0521). Remove any excess lubricant from the gears with a cloth. A symptom of worn drum drive gears is indicated by the irregularity, in height, of similar print characters. Examine the Self Test printout to determine if this is occurring. Replace both gears if damage is detected.

Figure 20. Drum Drive Gears

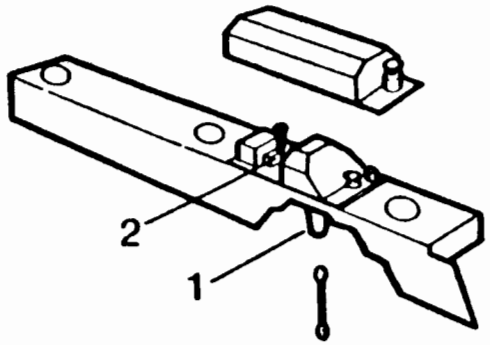


1. Inspect, Clean and Lubricate

PM DENSITOMETER MAINTENANCE

To access the Densitometer assembly, remove the printer EP interior closeout panel (this panel is located to the right of the review window). Clean the interior of the densitometer cone with a DRY cotton swab. Do not fully reinstall the cover at this time.

Figure 21. Densitometer Assembly

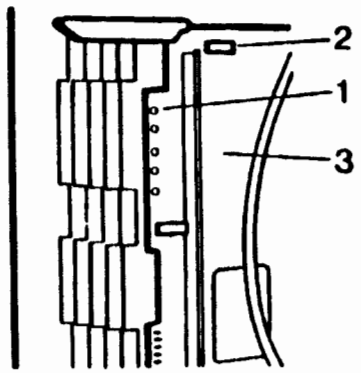


1. Clean Lens
2. Gain Adjust Potentiometer

PM 39 DENSITOMETER OFFSET ADJUSTMENT

Set the interior closeout panel in position; do not fasten. Close the printer top cover and paper input door; leave the printer front door slightly ajar (do not fully close). Initiate service tool command 644 (Set Densitometer to High Gain). While monitoring the voltage at TP5 "DMO" testpoint on the Monitor PCA adjust the Density Offset Adjustment potentiometer for 0.00 Vdc +/-.02 volts. Do not secure closeout panel until after PM 53.

Figure 22. Densitometer Offset Adjustment



1. TP5/DMO testpoint
2. Offset Adjustment Potentiometer
3. Monitor PCA

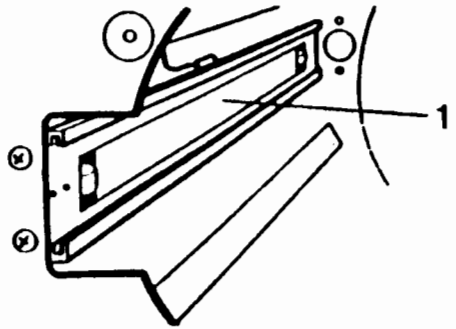
PM 40 EP AREA MAINTENANCE

Visually inspect and clean any paper dust, toner, or carrier debris from the EP cavity area of the printer. If necessary remove the developer tray from the EP frame for cleaning. Inspect the developer drive gear for damage. Clean gear if dirty.

PM 41 EL STRIP MAINTENANCE

Thoroughly clean the EL Strip with a cloth; use alcohol if necessary.

Figure 23. EL Strip

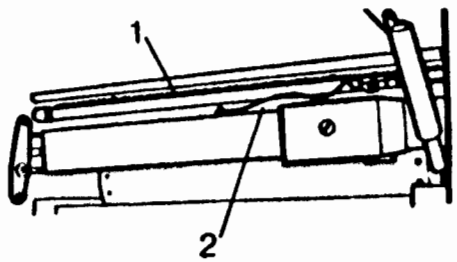


1. Clean EL Strip

PM 42 RETRACTION BRUSH RESISTANCE CHECK

Examine the retraction brush for excessive wear and damage. Observe if the ground wire is in good condition (not frayed or open). Using an ohm meter, measure the resistance of the brush to FRAME ground. The resistance should measure between 6 Kohms to 50 Kohms anywhere along the brush to ground. If the brush is damaged or a resistance "open" is found, replace the brush.

Figure 24. Retraction Brush Assembly



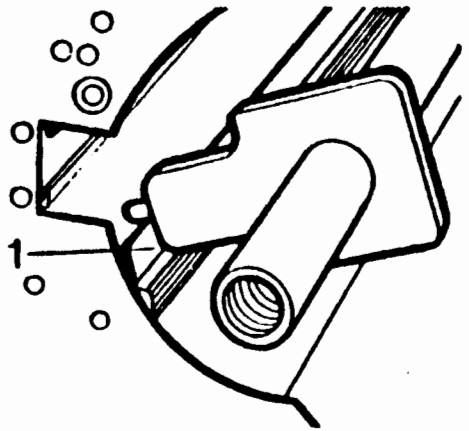
1. Check Brush Resistance to Ground
2. Inspect wire for damage

PM ETRACTION BLADE ADJUSTMENT

Visually inspect the retraction assembly for wear and damage. Using the retraction blade adjustment tool (P/N 02682-20458) perform the adjustment procedure.

Helpful Hints: Enable the retraction solenoid (752, ENTER, RUN, HALT. For convenience you may turn on the Erase and the Overall Illuminations Lamps (722 ENTER, 745 ENTER, RUN). Install the retraction blade adjustment tool, drum end bell, and verify the adjustment.

Figure 25. Retraction Blade Adjustment



1. Verify Blade Adjustment

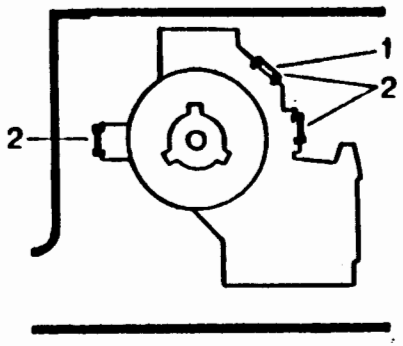
PM 44 CORONA(s) RAIL INSPECTION

Visually inspect the three corona rails for excess wear and damage. Note if any metal filing are detected. Replace damaged rails if necessary. If new corona rails are not readily available, the Primary and Simultaneous Corona rails can be turned end-for-end.

PM 45 PRIMARY CORONA RAIL RESISTANCE CHECK

Visually inspect the corona mounting rail. Disconnect J3 (Developer Bias Connector) from the High Voltage Power Supply PCA. Using an ohmmeter measure the resistance from the Primary Corona Rail to Frame Ground. If the resistance is greater than 7 MegOhms, replace the Primary Corona Screen PCA. Do not forget to reconnect J3 of the High Voltage Power Supply PCA after performing this procedure.

Figure 26. Corona Rails



1. Measure Resistance to Ground
2. Inspect for Damage and Wear

PM 46 PRIMARY CORONA SCREEN INSPECTION

Visually inspect the Primary Corona Assembly for cleanliness, corrosion, or loose wires. Clean assembly if necessary. Replace wires if excessive loose. Inspect the Primary Corona Screen, verify that it is not bent, excessively dirty, or damaged.

PM 47 SIMULTANEOUS CORONA GRID

Visually inspect the Simultaneous Corona Grid. Clean if dirty. Restring wires if excessively loose or damaged.

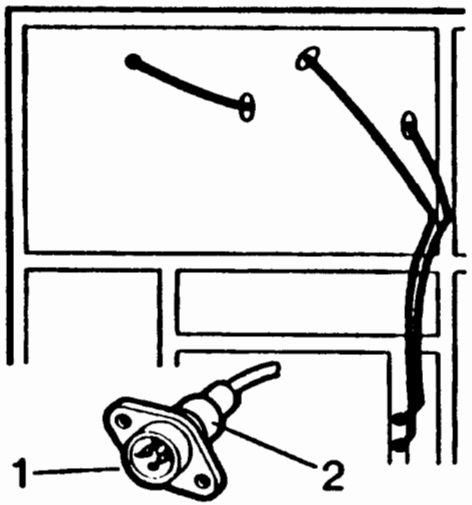
PM CORONA(S) ASSEMBLIES

Visually inspect all corona assemblies for cleanliness, loose wires, and for loose or damaged endball resistors. Inspect assemblies for signs of arcing. Replace defective corona components; restring wires if necessary.

PM 49 HIGH VOLTAGE CABLE INSPECTION

Visually inspect the High Voltage Cables for signs of arcing and damage. Inspect the corona endcap connectors for cracks and breaks. Damaged connectors could result in arcing. Verify the cable ties on the back EP wall firmly secure the cable high voltage connectors in position.

Figure 27. Corona High Voltage Cables

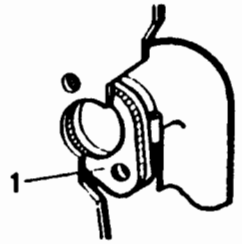


1. Examine for Connector Damage
2. Inspect for Signs of Arcing

PM 50 CLEANER STATION MAINTENANCE

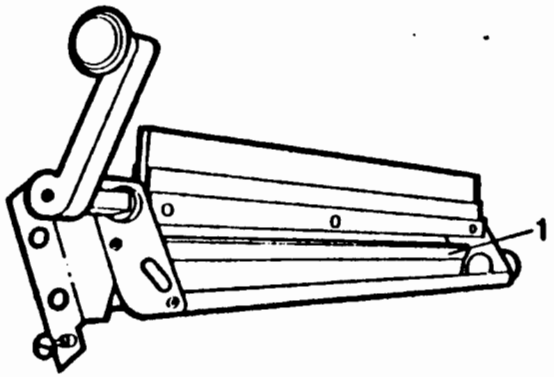
Remove the Cleaner Station from the printer. Visually inspect the cleaner station vacuum connection on the rear EP cavity wall for signs of leakage and toner contamination. Replace seal if necessary. On the cleaner station, verify that the internal cleaner blade seal (foam strip running lengthwise along the assembly adjacent to the wiper blade) is not damaged or excessively worn. Replace if necessary.

Figure 28. Cleaner Station Vacuum Connection Seal



1. Inspect Connector Seal for Damage

Figure 29. Cleaner Station



1. Inspect Wiper Blade Seal for Damage

Reinstall the Photoconductive Drum, Electostatic Monitor, Developer Assembly, and Corona Assemblies. Do NOT close the printer front door.

DEVELOPER BIAS VOLTAGE CHECK

Measure the Developer Station Bias as follows:

(a) Initiate device on command 736 (Developer Bias On), ENTER, Run.

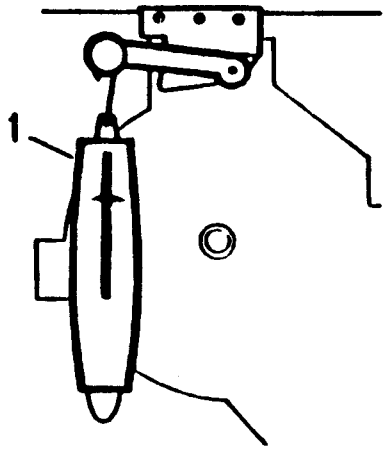
(b) Measure the developer bias voltage from the Developer assembly housing to frame ground (hint the drum shaft is at frame ground.

The Developer Bias Voltage should be +302 Vdc +/-10 Vdc. If the voltage is out of range, adjust the Dev Bias Calib potentiometer on the High Voltage Supply PCA until the voltage is within range.

PM 52 CLEANER BLADE TENSION CHECK

Using the Cleaner Blade Tension gauge (P/N 8750-0058), verify the wiper blade tension is 1000 grams. If the tension is not approximately 1000 grams adjust the handle backstop bracket. Close the printer front door when adjustment is completed.

Figure 30. Drum/Blade Tension Adjustment



1. Drum/Wiper Blade Tension 1000 grams

Reconnect the Drum Heater

RUN THE PRINTER

SELF TEST

PM 53 SELF TEST CHECKS

After the printer has run Self Test for approximately ten minutes, stop the printer and closely examine the Self Test printout. Perform the following checks.

Clean Drum Routine

To gain access to the printer, remove the EP interior closeout panel (to the right of the review window). In CE mode enter the following: 326, ENTER, 1, ENTER, 1 ENTER, RUN 1225. This sequence sets the clean drum interval to 1 sets the printer up to continuously display the clean drum measurement. The clean drum measurement should be 675 +/-25 counts. If the clean drum measurement is NOT within this range, adjust the Gain potentiometer on the Densitometer Assembly (see figure 21) until the display is in tolerance. After verifying the clean drum measurement, reset the clean drum interval to 500 K rotations by entering the following: 326, ENTER, 500, ENTER, 1, ENTER, RUN. Reinstall the EP interior closeout panel.

First Order Beam Count

Examine the latest Self Test and verify that "1st ord beam" is greater than 80 counts (90 counts is recommended). If First Order Beam is not 90 +/-10 counts, use service tool commands 622 (Calibrate Laser Power) and 623 (Measure Optics Parameters) to determine if a First Order Power level of 90 can be achieved. If a First Order Beam level of 90 can not be be achieved, replace the Laser Assembly. Note: a MCP firmware with a date code of 2414 or greater contains the Auto-Laser Calibration routine.

ESM Voltage Check

From the Sensor Diagnostic parameter section of the Self Test printout, note the "ESM voltage= XX" and "Door voltage= XX" readings. Under normal operating conditions the "ESM Voltage" equals the "Door Voltage" +/-2 counts. If the measurements are not within +/-2 counts, verify the ESM solenoid and mechanical linkage are operating correctly. If the mechanical linkage is OK, adjust the ESM Gain Adjustment potentiometer on the Monitor PCA until the measurement are within range. Note, you will have to restart the Self Test after each adjustment of the potentiometer.

Primary Corona Setting

Examine the Self Test printout. Under the High Voltage System parameter listings verify that the "Prim setting" is 190 +/- 10 counts. If the primary setting is NOT within range, restring the Primary Corona Assembly. This procedure assumes that the Dark Target is set to 160.

Simul. ous Corona Setting

Examine the Self Test printout. Under the High Voltage System parameter listings, verify that "Simul setting" is 80 +/- 10 counts. If the simultaneous setting is NOT within range, restring the Simultaneous Corona Assembly. If restringing the corona assembly does not bring the setting within range, restring the Simultaneous Corona Grid.

Dark Potentials

Examine the Drum Potentials section of the Self Test printout. Observe the dark potentials parameters:

"Dark poten = XXX"
"Doc poten DD = XXX"
"Doc poten LD = XXX"
"Dark target = XXX".

These potentials reflect the "condition" of the drum in terms of lifetime. In a properly operating electrophotographic system, the four dark potentials should be within +/-10 counts of one another. If the "Doc Poten DD = XXX" parameter is less than 135 counts, the drum is near the end of it's lifetime and you should recommend that it be replaced. It is important to remember that the Primary and Simultaneous Corona Systems greatly affect the Dark Potentials and that these systems should be operating in top condition before replacing the drum.

Light Potentials

Examine the "Drum Potentials" section of the Self Test printout. Observe the following light potentials:

"Light poten = X"
"Doc poten LL= X"
"Doc poten DL= X"
"Light target= X"

These potentials reflect the "condition" of the drum in terms of lifetime. In a properly operating electrophotographic system, the four light potential measurements should be within +/-10 counts of one another. If the "Doc Poten LL" measurement is greater than +30 counts, the drum is near the end of it's lifetime and you should recommend that the drum should be replaced. It is important to remember that the light potentials are affected by the Primary Corona, Simultaneous Corona, and the Laser operating systems. Always verify that these operating systems are in their peak operating condition.

Self Test Printout Comparison

Compare the print quality of the current Self Test to the quality of the Self Test run prior to the performing of the Preventive Maintenance Routines. Save the printout for future reference.

Fusing Check

Examine a copy of your current Self Test printout. To verify that the print is fully fused, rub the printed output with your fingers. If a fusing problem exists, the print will smear. The following printer components may cause poor fusing:

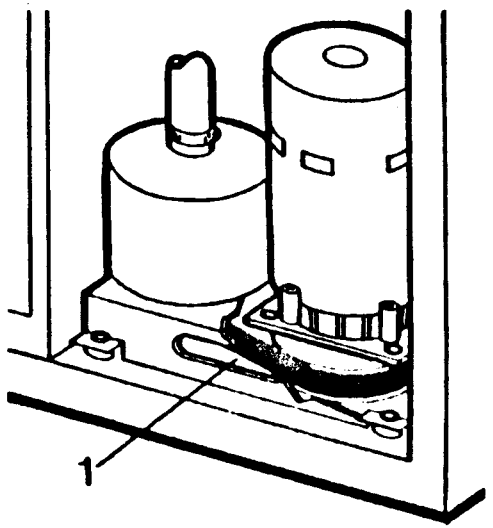
a. Low vacuum (see PM 4)
b. Incorrect line voltage adjustment (see PM 12)
c. Weak fusing system components (fusing bulb, preheater assembly)
d. Incorrect setting of the Preheater Adjustment Switch (S1) Under normal operating conditions this switch should be set to position 3. If excessively heavy paper is being used for printing or the operating environment is unusually cool, this switch should be set to position 4 or 5.

> Perform the following Preventive Maintenance procedures after TWO MILLION drum rotations.

PM 54 VACUUM BLOWER BELT

Open the front door of the printer and remove the vacuum blower cover. Inspect the belt vacuum belt for cracks, splits, or fraying. Verify the belt's tension is correct (when correct the belt should deflect approximately 6 mm (1/4 inch) at the center of it's span).

Figure 31. Vacuum Motor/Separator Assembly



1. Belt Tension 6 mm (1/4 inch) Deflection

PM ' ACUUM HOSE INSPECTION

In . all vacuum hoses for leaks or damage (see figure 3). Replace all damaged hoses.

PM 56 PAMM BLOWER VANE and HOSE INSPECTION

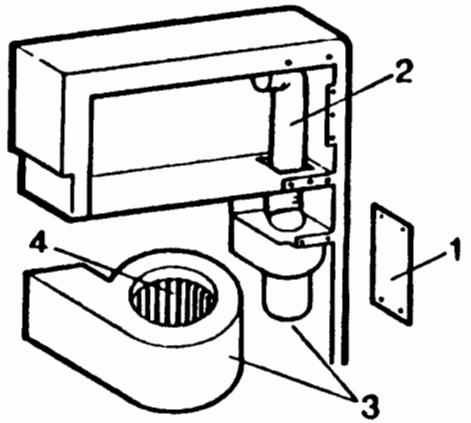
Remove the PAMM door and access the Blower Motor as follows:

a. Disconnect the PAMM Door Connector and Ground cable.
b. Disconnect the Fuser Fan Connector.
c. Pull PAMM Cable through the opening in the frame.
d. Disconnect the PAMM Door restraint cable.
e. Remove the PAMM Blower Grill (see figure 32).
f. Remove the access panel to the PAMM Blower hose (see figure 32); this requires that you remove 12 screws.
g. Close the printer top cover and open the PAMM door slightly, using the blower grill access hole and bottom of the flapper box as handles lift the PAMM door off its hinges and place the door in a working position.
h. Remove two hoses clamps and remove the blower hose.
i. Remove the blower motor (three screws).

Using a brush, thoroughly clean the blower vanes. Clean (vacuum) all built up dirt within the assembly. Examine the blower hose, replaced if cracked, split or damaged.

Using a brush, thoroughly clean the blower vanes. Clean (vacuum) all built-up dirt within the assembly. Examine the Blower Hose; replace if cracked, split or damaged.

Figure 32. PAMM Door and PAMM Blower

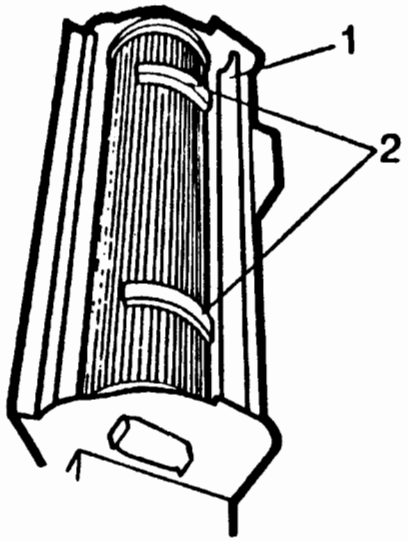


1. Blower Grill
2. Inspect Blower Hose
3. Blower Motor
4. Clean the Blower Vanes

PM 57 DEVELOPER DOCTOR BLADE ADJUSTM

Purge the Developer assembly of the developer mixtu Using the Go/No-Go guage (P/N 02682-20533 and -20534) verify the doctor blade gap. Adjust if necessary. Replenish the assembly after verifying.

Figure 33. Doctor Blade Adjustment



1. Doctor Blade
2. Go/No Go Guages

HP PART NUMBER	ASSEMBLY DESCRIPTION
	BELTS
1500-0623	ELEVATOR DRIVE BELT
1500-0567	TENSION MOTOR DRIVE BELT
1500-0548	VACUUM MOTOR DRIVE BELT
	BRUSHES
02682-60005	TRANSFER STATION
02682-60495	TENSILE STRIP (PAMM DOOR)
02682-60496	TENSILE STRIP (OUTPUT BRACKET)
	BULBS and LAMPS
2140-0503	COURTESY LAMP (120 V)
02682-60559	ELECTRO-LUMINESCENT STRIP ASSEMBLY
2140-0497	FUSER LAMP
2140-0506	OVERALL ILLUMINATION/ERASE LAMPS
	CABLES
02682-60180	AC SWITCHING LOADS CABLE
02682-60083	CARDCAGE FAN CABLE
02682-60177	DC POWER PCA CABLE
02682-60344	DEVELOPER MOTOR CABLE
02682-60181	DEVELOPER BIAS CABLE
02682-60343	DRUM DRIVE MOTOR CABLE
02682-60290	DRUM DRIVE TRANSFORMER CABLE
02682-60291	DRUM HEATER CABLE
02682-60270	DVS CABLE
02682-60224	ESM CABLE
02682-60433	FRONT DOOR SWITCH CABLE

HP PART NUMBER	ASSEMBLY DESCRIPTION
02682-60019	FUSER
02682-60143	HIGH VOLTAGE (PRIMARY CORONA)
02682-60144	HIGH VOLTAGE (TRANSFER CORONA)
02682-60146	HIGH VOLTAGE (SIMULTANEOUS CORONA)
02682-60199	COURTESY LAMPS
02682-60028	INPUT POWER
02682-60189	ISOLATED AC LOADS CABLE
02682-60302	LAMP CABLE
02682-60142	MAIN HARNESS
02682-60415	OPTICS PCA
02682-60337	PAMM DOOR
02682-60134	SAFETY CABLE (CHAINBOX)
02682-60287	SAFETY CABLE (FLAPPER BOX)
02682-60008	STATIC BRUSH
02682-60289	TOP OF DRUM (POSITION SENSOR)
02682-60184	VACUUM MOTOR
02682-60456	POWER CORD ASSEMBLY (60 Hz)
	RIBBON CABLES
8120-2997	AC POWER PCA (J7)
8120-2999	DC POWER PCA (J3)
8120-3002	DENSITOMETER (DSM)
8120-3338	DCS I/O (HP-IB)
8120-3147	DCS I/O (FRONT PLANE)
8120-2996	DISPLAY PCA
8120-2998	DISPLAY (ALPHANUMERIC)
8120-3339	MEMORY PCAs (FRONT PLANE)
8120-3003	OPERATOR KEYBOARD
8120-3005	OPTICS PCA
8120-3000	PAPER CONTROL PANEL

HP PART NUMBER	ASSEMBLY DESCRIPTION
8120-3004	POWER DISTRIBUTION PCA
8120-3001	SENSOR PCA (J1)
	CAPACITORS
0160-6058	DEVELOPER MOTOR
0180-3103	DRUM BRAKE
0160-6058	DRUM DRIVE
0160-5290	ELEVATOR MOTOR
0160-5290	FLAPPER MOTOR
	CONSUMABLES
92181A	CARRIER (BOX of 24 bottles)
92180D	DRUM/WIPER BLADE
92182D	DEVELOPER MIXTURE - STARTER (6 btls)
92180A	TONER (Box of 12 bags)
92181A	DISPOSAL BOTTLES (Box of 6 bottles)
92183A	SPLICING TAPE (Box of 6 rolls)
	COVERS/DOOR/HINGES
02682-60066	DOOR (PAPER INPUT)
02682-60386	FRONT DOOR
02682-60385	RIGHT SIDE COVER
02682-60371	BACK COVER (PANEL)
02682-60369	FUSER SYSTEM COVER
02682-00062	LOWER EP PANEL (BLOWER ASSEMBLY)
02682-40129	AC POWER PCA COVER (240 VOLTS)
02682-40205	POWER SUPPIES COVER

HP PART NUMBER	ASSEMBLY DESCRIPTION
	FANs
3160-0342	CARDCAGE 50/60 Hz
3160-0263	EP PURGE 50/60 Hz
3160-0339	FUSER FAN 60 Hz
02682-60294	PAMM BLOWER 60 Hz
3160-0339	AIR MODULE 60 Hz
	FILTERs
02682-00114	CARDCAGE FILTER (13 X 5.5)
02682-60348	EP PURGE FILTER
02682-00584	CARDCAGE FILTER #2
02682-00388	PAMM FILTER
02682-00389	PREHEATER (CARTRIDGE FILTER)
02682-60607	VACUUM BAG
	FILTERs (ELECTRONIC)
02682-60285	AC LINE FILTER (INPUT)
02682-60426	LASER POWER SUPPLY
	FUSEs
2110-0001	1.0 Amp
2110-0012	.5 Amp
2110-0030	5.0 Amp
2110-0033	.75 Amp
2110-0365	4.0 Amp
2110-0383	8.0 Amp

HP PART NUMBER	ASSEMBLY DESCRIPTION
	MISCELLANEOUS
1410-1070	DRUM BEARING
92-0078	CASTER
2-40103	CORONA ENDCAPS
2-60217	DEVELOPER VOLUME SENSOR
02682-60291	DRUM HEATER
02682-40029	FLAPPER ARMS
02682-40007	FRICTION WHEELS (OUTPUT TRACTORS)
02682-40118	PREHEATER INSULATION #3
02682-40119	PREHEATER INSULATION #4
02682-40049	PREHEATER INSULATION #4 (RIGHTSIDE)
02682-69028	LASER (HeNe)
0515-0241	NYLON SCREWS (DEVELOPER HOUSING)
1813-0138	RF AMPLIFIER (OPTICS PCA)
02682-00891	ROLLERS (DEVELOPER TOP SEAL)
02682-60567	RIGHT SEAL (DEVELOPER TOP SEAL)
02682-60566	LEFT SEAL (DEVELOPER TOP SEAL)
02682-60133	STACKER TRAY (AUXILIARY TABLE)
02682-00439	TOP OF FORM LABEL
1530-0398	INPUT TRACTOR (RIGHT SIDE)
1530-0399	INPUT TRACTOR (LEFT SIDE)
02682-60349	OUTPUT PINWHEELS (RIGHT SIDE)
02682-60345	OUTPUT PINWHEELS (LEFT SIDE)
02682-40153	PINWHEEL DOORS
02682-40004	STRIPPER FINGERS (PINWHEELS)
	MOTORs
02682-60367	CHAINBOX DRIVE ASSEMBLY 50/60 Hz
02682-60344	DEVELOPER DRIVE MOTOR 50/60 Hz
02682-60343	DRUM DRIVE MOTOR 50/60 Hz
02682-60366	ELEVATOR MOTOR ASSEMBLY 50/60 Hz
02682-60394	FLAPPER MOTOR ASSEMBLY 60 Hz
3140-0627	INPUT STEPPER MOTOR (DC)
02682-60037	SCANNER DRIVE MOTOR (DC)
3140-0634	TENSION DRIVE MOTOR (DC)
	PCAs
02682-60014 *	AC POWER PCA
02682-60204	BACKPLANE
02682-60497 *	CHARACTER PROCESSOR PCA
02682-60202 *	CONTROL PCA
02682-60001 *	DATA PROCESSOR PCA
02682-60013 *	DC POWER PCA
02682-60004 *	DCS I/O PCA (STD)
02682-60525 *	DCS I/O PCA (GRAPHICS)
02682-60268	DENSITOMETER
02682-60030 *	DISPLAY PCA
02682-60214	ENCODER PCA (INPUT STEPPER TACH)
02682-60421	HP-IB CONNECTOR PCA
02682-60201 *	HIGH VOLTAGE PCA
02682-60301	LAMPHOLDER (OVERALL and ERASE)
02682-60570 *	MACHINE CONTROL PROCESSOR PCA
30092-60001 *	MEMORY ARRAY PCA (256 Kbyte)
30161-60001 *	MEMORY ARRAY PCA (1 MegByte)
30094-60001 *	MEMORY CONTROLLER PCA
02682-60203 *	MONITOR PCA
02682-60475 *	OPTICS PCA
02682-60351	PRIMARY SCREEN PCA
02682-60003 *	PRINT CONTROL PCA
02682-60015 *	POWER DISTRIBUTION PCA
02682-60026	SCANNER DRIVER PCA
02682-60213	SENSOR PCA

HP PART NUMBER	ASSEMBLY DESCRIPTION
02682-60123	TRIAC ASSEMBLY (w cables)
02682-60102 *	TRIAC PCA (w/o cables and triacs)
	PULLEYS and GEARS
02682-20315	TENSION MOTOR PULLEY
1500-0633	OUTPUT TENSION DRIVE PULLEY
3140-0657	CHAIN DRIVE GEAR BOX (60 Hz)
3140-0651	DEVELOPER DRIVE GEAR BOX (60 Hz)
3140-0693	DRUM DRIVE GEAR BOX (50/60 Hz)
02682-20364	ELEVATOR CLUTCH PULLEY
02682-20363	ELEVATOR DRIVE PULLEY
02682-20081	ELEVATOR LEADSCREW
3140-0656	ELEVATOR MOTOR GEARBOX
	POWER SUPPLIES
63312f #P02	+5 and +/- 12 Vdc
63903F	+28 Vdc
02682-60427	LASER POWER SUPPLY
	SPRINGS
1460-1832	ESM SOLENOID ASSEMBLY
1460-1748	PREHEATER ASSEMBLY (MOUNTING)
1460-1780	SPRING (PAPER INPUT DOOR ACTUATOR)
1460-0650	SPRING (WEB TENSION - COMPRESSION)
1460-1795	SPRING (PAPER WIDTH SENSOR)
1460-1836	SPRING (CHAINBOX SAFETY)
1460-1913	SPRING (PREHEATER FILTER COVER)
1530-0374	TOP COVER GAS SPRING
1460-1833	TRANSFER SOLENOID ASSEMBLY
	SOLENOIDS
02682-60333	ESM ASSEMBLY
02682-60332	RETRACTION ASSEMBLY
02682-60210	SPLICE SOLENOID
	SWITCHES (MECHANICAL and SOLID STATE)
0490-1233	AC CONTACTOR (24V - 3 Amp)
0490-1283	DEVELOPER MOTOR SSR (120 V)
3101-0429	ELEVATOR TOP/BOTTOM (HALL EFFECT)
3105-0131	CIRCUIT BREAKER (FRONT)
02682-60433	FRONT DOOR (INTERLOCK)
3101-0494	PAPH DOOR (INTERLOCK)
3105-0133	REAR MAIN POWER BREAKER
3101-2838	STACKER SAFETY (TOP OF STACK)
3101-2838	STACKER SAFETY (CHAINBOX)
3101-2838	STACKER SAFETY (FLAPPER BOX)
3101-2401	TONER HOPPER (INTERLOCK)
3107-0016	VACUUM BAG FULL SENSOR
3101-2401	DRUM WIPER BLADE (INTERLOCK)
3101-0429	TOP OF DRUM (HALL EFFECT)
	SUBASSEMBLIES
02682-60135 *	CHAINBOX ASSEMBLY
02682-60519	CLEANER STATION
02682-67002	CLEANER STATION UPGRADE KIT
02682-60054 *	PRIMARY CORONA ASSEMBLY
02682-60057 *	SIMULTANEOUS CORONA ASSEMBLY
02682-60563 *	TRANSFER CORONA ASSEMBLY
02682-60268	DENSITOMETER

HP PART NUMBER		ASSEMBLY DESCRIPTION
02682-60164	*	DEVELOPER ASSEMBLY
02682-60088	*	ELECTROSTATIC MONITOR (ESM)
02682-60096		ELEVATOR ASSEMBLY (60 Hz)
02682-60095	*	FLAPPER BOX ASSEMBLY (60 Hz)
2682-60100	*	FUSING SYSTEM
J2682-60033	*	OPTICS CASTING
02682-60550		PAPER CONTROL KEYBOARD ASSEMBLY
02682-00573		PAPER CONTROL KEYBOARD OVERLAY
02682-60419		PAPER OUT/STACK MISFOLD SENSOR
02682-60336		PAPER WIDTH SENSOR
02682-60092		PRINT CONTROL PANEL ASSEMBLY
02682-00572		PRINT CONTROL PANEL OVERLAY
02682-60379		STACKER CONTROL PANEL
02682-60172	*	TONER HOPPER ASSEMBLY (60 Hz)
02682-60093		VACUUM BLOWER ASSEMBLY
02682-60084	*	WEB TENSION ASSEMBLY

TOOLs

8710-1440	BACKCOVER KEY
02682-60451	CORONA WIRE TENSION TOOL
02682-20534	DOCTOR BLADE TOOL ("GO" GAUGE)
02682-20533	DOCTOR BLADE TOOL ("NO-GO" GAUGE)
7225-0312	CORONA WIRE
02682-60441	DRUM/ROLL SPACING (DRS) TOOL
02682-20503	PAPER MISFOLD ADJUSTMENT
8710-1414	PIN EXTRACTOR
02682-20458	RETRACTION BLADE ADJUSTMENT
02682-60606	MAGNET ANGLE ALIGNMENT

HP PART NUMBER	ASSEMBLY DESCRIPTION
02682-60501	MAGNETIC SPLICING STRIPS
0101-0527	VACUUM GUAGE
8750-0058	WIPER BLADE/DRUM TENSION TOOL
02682-60549	VACTRA NO. 2 (LUBRICANT OIL)
6040-0521	MOLY-COTE G (LUBRICANT PASTE)

TRANSFORMERs

02682-60140	AC POWER PCA
02682-60290	DRUM DRIVE
02682-60018	ISOLATION
02682-60009	SIMULTANEOUS CORONA
02682-60417	ZERO-CROSSING

50 Hz PARTS

02682-60439	CHAINBOX DRIVE MOTOR ASSY (50 Hz)
3140-0666	CHAINBOX GEAR BOX (50 Hz)
02682-60413	DEVELOPER DRIVE MOTOR ASSY (50 Hz)
3140-0659	DEVELOPER DRIVE GEAR BOX (50 Hz)
02682-60440	ELEVATOR DRIVE MOTOR (50 Hz)
3140-0667	ELEVATOR DRIVE GEARBOX (50 Hz)
02682-60445	FLAPPER MOTOR (50 Hz)
02682-60424	PAMM BLOWER (50 Hz)
02682-60412	TONER HOPPER (50 Hz)
02682-60410 *	VACUUM MOTOR ASSEMBLY (50 Hz)
3160-0056	AIR MODULE FAN (50 Hz)

EXCHANGE NUMBER	ASSEMBLY DESCRIPTION
	PCAS
02682-69006	AC POWER PCA
02682-69497	CHARACTER PROCESSOR PCA
02682-69024	CONTROL PCA
02682-69001	DATA PROCESSOR PCA
02682-69005	DC POWER PCA
02682-69004	DCS I/O PCA (STANDARD)
02682-69478	DCS I/O PCA (GRAPHICS)
02682-69008	DISPLAY PCA
02682-69023	HIGH VOLTAGE PCA
02682-69570	MACHINE CONTROL PROCESSOR
30092-69001	MEMORY ARRAY PCA (256 Kbyte)
30161-69001	MEMORY ARRAY PCA (1 Mbyte)
30094-69001	MEMORY CONTROL PCA
02682-69025	MONITOR PCA
02682-69475	OPTICS PCA
02682-69480	PRINT CONTROL PCA
02682-69007	POWER DISTRIBUTION PCA
02682-69018	TRIAC PCA (w/o cables and triacs)

EXCHANGE NUMBER	ASSEMBLY DESCRIPTION
	ASSEMBLIES
02682-69019	CHAINBOX ASSEMBLY
02682-69020	DEVELOPER ASSEMBLY
02682-69010	DRUM/WIPER BLADE
02682-69015	ELECTROSTATIC MONITOR
02682-69016	FLAPPER BOX ASSEMBLY
02682-69017	FUSING SYSTEM
02682-60028	LASER (HeNe)
02682-69009	OPTICS CASTING
02682-69011	PRIMARY CORONA ASSEMBLY
02682-69013	SIMULTANEOUS CORONA ASSEMBLY
02682-69021	TONER HOPPER (60 Hz)
02682-69029	TONER HOPPER (50 Hz)
02682-69012	TRANSFER CORONA ASSEMBLY
02682-69014	WEB TENSION ASSEMBLY
02682-69093	VACUUM MOTOR ASSEMBLY (60 Hz)
02682-69410	VACUUM MOTOR ASSEMBLY (50 Hz)

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630 -- Operator Access Level

This command returns the printer to the operator access level. All disable flags are reset, but the reset functions of the 600 command are not performed. If the printer is in any of the special run modes (refer to the 600 command), it remains in that mode when the 630 command is entered. Any service mode messages in the display are unchanged.

631 -- CE Access Level

This command puts the printer in the service command mode. If the printer is in the operator access level at the time this command is entered, a message appears asking for the CE access code. As the code is entered, it is blanked out on the display. If any operator messages are in the display, they are converted to service level messages.

631

641 -- Reset +28 V power supply

2680

This command resets the +28 V power supply.

642 -- Turn Laser Supply Off

This command turns off the laser power supply.

[redacted]

643 -- Set Densitometer to Low Gain

This command sets the densitometer to the low gain mode.

3

644 -- Set Densitometer to High Gain

This command sets the densitometer to the high gain mode.

604

650 -- Display Fault Message Which Last Shut Down Machine

600

This command recalls the display which last caused the printer to disable during printing. This command is useful when an intermittent interlock switch causes the printer to halt, but inhibits the message.

651 -- Display error fault log

This message is used to display the error fault log.

652 -- Clear error fault log

This message is used to clear the error fault log.

660 -- New Drum/Wiper Routine

When the wiper blade is lowered onto a new drum, it is necessary to first provide toner on the drum to lubricate the drum surface and prevent damage. This routine is automatic, only requiring the service representative to lower the wiper blade when prompted to do so.

To run this routine, refer to the Photoconductive Drum Installation procedure in Chapter V of this manual.

661 -- Clean Drum Measurement

This command allows the service representative to take a clean drum reading manually by pressing 661, ENTER, RUN. The printer warms up and measures the clean drum reflectance, display the result, and update the clean drum parameter. When the measurement is complete, the printer halts and returns to the normal print mode.

670 -- Display External Register

This command displays the status of any MCP external register. After pressing 670, ENTER, a prompt appears asking for the select number. These numbers range from 0 to 15 and stand for the select lines from 1.0 to 2.7, respectively. The data from the external register is displayed in hex (base 16) format.

671 -- Display RAM location

This command allows the contents of any MCS RAM location to be displayed by entering its decimal address.

674 -- Initiate Electrostatic Monitor Reading

This command causes the electrostatic monitor to take a reading of the photoconductive drum's surface and displays the measured value.

675 -- Initiate Densitometer Reading

This command causes the densitometer to take a reading of the photoconductive drum's surface and displays the measured value.

676 -- Enable High Voltage System

WARNING

Do NOT remove the drum in this mode of operation. Removal of the drum allows direct access to high voltages.

This service mode command allows the printer front door to be opened without disabling the +28V supply or opening the AC contactor. The Device ON/OFF commands can then be used to enable certain devices. Failures which would normally disable the +28V supply or open the AC contactor continue to do so. The laser supply and the RF driver are disabled in this mode.

To enter this command, the printer front door must be closed, and the printer must be in the service command mode. The front door must be opened within three seconds after pressing 676, ENTER to enter this mode. This mode is aborted when the door is closed.

The message "High voltage enabled" is displayed while in this mode. In addition, the speaker will sound a tone once a second as a reminder of the hazardous voltages present in the drum area if any of the following devices are enabled via a Device ON/OFF command:

- Transfer corona
- Primary corona
- Simultaneous corona
- Developer bias
- Erase lamp
- Overall illumination lamp

This mode can be used to check for the following conditions:

- Developer shorts
- Corona arcing
- Erase lamp failures
- Overall illumination lamp failures
- Loading start developer

679 -- Hang Up Processor

This command causes the processor to execute a "jump to self" instruction indefinitely, effectively causing the processor to cease functioning. The one-shot circuit on the MCP PCA should time out and cause the reset line on the backplane to be enabled.

Internal Error Log (651,652)

The printer has the capability to save certain conditions in NVR for future reference. Error conditions that are customarily intermittent or unimportant to the operator are logged. By checking this log, the service representative can determine what errors have occurred since the log was last cleared, even if the fault condition does not exist at that instant.

Listed below are the errors that are logged in this manner and the action that should be taken. During or before each service visit, the log should be checked. Before leaving the site, these errors should be recorded in the maintenance records for the printer with the details of the corrective actions taken. The log should then be cleared. The 651 command is used to display the fault message log. The 652 command is used to clear the log.

Vacuum bag full*

A vacuum bag is considered fully used when the pressure drop across the bag exceeds the limit of the pressure sensing switch. Vibration and subsequent changes in vacuum pressure may cause the pressure to return to a normal level. Because of this, it is likely that the "Vacuum bag full*" message will NOT be displayed during a service visit. If this message appears when checking the error log, it indicates that the bag full condition was met at least once since the last time the log was cleared. In this case, the bag should definitely be replaced.

The bag is designed to hold at least 100 K rotations of waste toner (assuming normal waste rates) after the full condition is first detected. This allows for a situation where the full condition occurs just after a service visit and allows continued operation until the next PM. It is a good idea to check and/or replace the bag at least every two or three PM visits.

* Message is eliminated when MCS firmware, date code 2414 or greater is installed in printer.

Vacuum system fail

For printers equipped with MCS firmware, date code 2414 or greater, the message reads Vacuum system fail and an absence of vacuum is detected. The message could be due to the vacuum bag being full, or some other fault condition. Printing is halted and the RUN key must be pressed to reset the printer for operation.

Erase lamp warn/Overall illumination warn

The most common failure of these lamp assemblies is that a filament in one of the lamps opens. The lamps are wired with two groups in parallel and five lamps in series per group. When one filament opens, the entire group extinguishes. The second group provides enough light for normal printer operation and the current sensors in the printer will note that one group is out. Because of the thermal conditions on the filament, it is quite common for the ends of a broken filament to make contact and resume normal operation. Thus, the fault is intermittent and again it is likely that the fault will not be evident during a service visit.

When replacing lamps, if all the bulbs are replaced at the same time it is possible that the second group will fail shortly after the first. With both groups out, the printer will not operate. If only the lamps in the faulty group are replaced, one group of lamps will be only a half-life old. Using the alternate group replacement technique, the reliability of the printer is improved.

Coronas contaminated

This condition is intermittent for a number of reasons; First, it requires that two abnormal conditions co-exist. Second, the dark potential measurement and the primary current measurements are taken asynchronously. Therefore, even if the condition is not intermittent, detection could be. Errors of +/-4 counts in the ESM and +/-1 in the A/D as well as in the drum charging process also contribute.

Proper corrective action is to clean the primary corona assembly. Since contamination of the simultaneous and transfer assemblies cannot be detected, clean all the corona assemblies if the primary corona is thought to be contaminated.

Relay warning

This condition exists when the printer senses that it cannot open a preheater pad relay but, since the paper width measured at the time is sufficiently wide, the relay should be closed anyway. The fault that causes the relay to appear closed may be intermittent, or the condition is not prevent printing. In any case, there is at least an intermittent fault that may prevent operation with paper of smaller width.

ES loop warn 4

This condition is also intermittent and usually irrelevant to the user but sometimes indicates an imminent failure.

The message indicates that the potentials did not reach the target range in the allotted time of 10 rotations after starting. This could be due to changes in environmental conditions since the last time the printer was operated. It could also indicate that some systems are not as warm as they were at the operating point, the drum could be marginal electrically, or some other change has occurred since last operation. Because of the large number of variables and their interaction, intermittent warnings are common. Usually these marginal conditions are not obvious in the printed output.

3-44. Device On/Off Commands (700/800 Series)

The Device On and Device Off keystroke commands enable service representatives to control individual or combinations of electrical or electromechanical loads with the RUN and STOP keys.

The basis of this series of commands is the device list. The device list is a RAM image of bits corresponding to the I/O bits of the MCS. This two-dimensional array of bits is built up by entering the Device On (7XX) commands. Each 7XX command has one or more I/O bits associated with it that are merged into the device list when the command is entered. The corresponding Device Off command (8XX) replaces those bits with zeros in the device list. Some 7XX commands control devices which have multiple-bit inputs, such as the high-voltage power supplies and the tension motor driver. In these cases, when the 7XX command is entered, the program checks the RAM register where the current setting of the device is kept, and writes that value into the proper field of the device list.

NOTE

Once the field is merged into the device list, changing the setting of the device does not affect the device list. In order to change the hardware setting of a device being controlled in the Device On/Off mode, it is necessary first to change the setting in RAM with a 3XX command, then to re-enter the 7XX command for that device to update the device list.

In order to use the Device On/Off commands, the printer must be completely stopped and idle. If a Device ON/OFF command is entered when the printer is not idle, the "Command not allowed" message is displayed and the entry will not be accepted. If the 7XX or 8XX entry is accepted, the Device On/Off mode will be entered, signified by a display with the crosshatch character (#) in the first position. While in this mode, devices in the device list are represented in the display by two-digit numbers separated by cross-hatches (#). The two-digit numbers correspond to the last two digits of the 7XX and 8XX commands.

Once the crosshatch message is displayed, pressing the RUN key enables those devices in the list, and pressing the HALT key disables them. The combination of devices in the list, therefore, can be controlled as a unit by those two keys. Whether the devices are on or off can be immediately determined by checking the RUN LED, which is illuminated when the list is on. When the list is on, the program continuously writes the device list I/O image to I/O 300 times per second. Devices can be added or deleted from the device list regardless of whether the list is in the "on" mode, provided that at no time is the list on when an illegal combination of devices are in the list. Adding a device to the list in the "on" mode causes that device to turn on immediately if there is not an illegal combination. The following are the illegal device combinations:

A. fuser on, fuser fan not on;

B. drum on, vacuum not on;

C. stacker up, stacker down;

D. steppers forward, steppers reverse.

If an action causes an illegal combination when the list is on, an "Illegal device comb" message will appear and the action is not allowed.

There can be a maximum of six items in the list at a time. Attempting to add more than six items will result in a "Device list full" message.

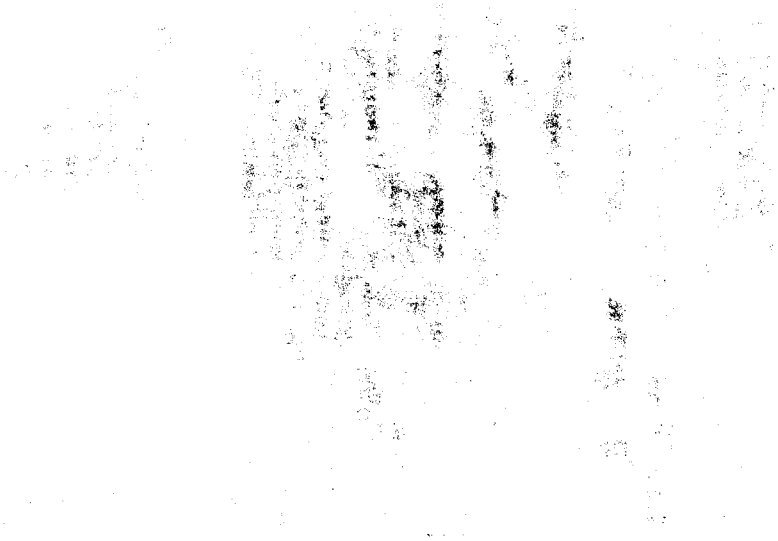
Certain Device On/Off commands are set up to enable a device for a certain amount of time. When one of these device commands is in the device list, pressing RUN will cause the devices in the list to turn on for the amount of time specified. After that period, the entire list turns off and the RUN LED extinguishes. The time-limited device commands are: (1) Toner hopper motor for two seconds, (2) Fuser for two seconds, and (3) Preheater for 10 seconds. If more than one time-limited device commands are in the list, the list stays on for the shortest time specified in the list.

Table 3-15. Device On/Off Commands

Command	Message
702	Device On--Drum Motor
722	Device On--Erase Lamp
724	Device On--Toner Hopper Motor
725	Device On--Toner Hopper For 2 Seconds
731	Device On--Primary Corona
736	Device On--Developer Bias
741	Device On--Simultaneous Corona
745	Device On--Overall Illumination
746	Device On--Electrostatic Monitor Door*
751	Device On--Transfer Corona
752	Device On--Transfer Engage
760	Device On--Scanner
770	Device On--Preheater Print
771	Device On--Preheater Print, 10 Seconds
774	Device On--Fuser
775	Device On--Fuser For 2 Seconds
776	Device On--Fuser Fan
780	Device On--Purge Fan
790	Device On--Steppers Forward
791	Device On--Steppers Reverse
792	Device On--Tension Motor Forward
793	Device On--Elevator Up
794	Device On--Elevator Down
795	Device On--Flappers
796	Device On--Splice Air Solenoid
801	Device Off--Vacuum Motor
802	Device Off--Drum Motor
822	Device Off--Erase Lamp
824	Device Off--Toner Hopper Motor
825	Device Off--Toner Hopper For 2 Seconds
831	Device Off--Primary Corona
835	Device Off--Developer Engage
836	Device Off--Developer Bias
841	Device Off--Simultaneous Corona
845	Device Off--Overall Illumination
846	Device Off--Electrostatic Monitor Door*
851	Device Off--Transfer Corona
852	Device Off--Transfer Engage
860	Device Off--Scanner
870	Device Off--Preheater Print
871	Device Off--Preheater Print, 10 Seconds
874	Device Off--Fuser
875	Device Off--Fuser For 2 Seconds
876	Device Off--Fuser Fan
880	Device Off--Purge Fan
890	Device Off--Steppers Forward

891 Device Off--Steppers Reverse
892 Device Off--Tension Motor Forward
893 Device Off--Elevator Up
894 Device Off--Elevator Down
895 Device Off--Flappers
896 Device Off--Splice Air Solenoid

* Indicates MCP firmware date code <2210.



SECTION II.
PRINTER DISPLAY MESSAGES

2-1. Diagnostic Error Message Listing

The following messages are displayed by the printer during error situations. The three digit number to the right of each message represents the error code sent to the host system and recorded in the printer's error log. The Fault Type and Operator Message designations are defined below.

FAULT TYPE
- A. Failure requiring repair - print stopped
- B. Unrecoverable fault - print stopped
- C. Warning - failure imminent
- D. Operator attention required - print stopped
- E. Warning - operator attention required
- F. Machine halted by letting one-shot time out

OPERATOR MESSAGE
- A. Hardware malfunction
- B. Advisory condition
- C. Not displayed in operator mode
- D. same message
- E. Process adjusting

ALPHABETICAL MESSAGE INDEX

FAILURE MESSAGE	ID #	FAULT TYPE	OPERATOR MESSAGE	
AC Contactor Short	-	B	A	
AC triac short	267	B	A	
ADC hung up	210	A	A	
A/D data invalid	240	A	A	
Advisory Condition	-	-	-	
A/O modulator fail/warn	200	A	A	*
	300	C	B	*
Beam detect warning/failure	201	A	A	
	301	C	B	
Cant maintain target	-	-	-	
Can't turn off +28V	328	C	C	
Cardcage overtemp	241	A	A	
	305	C	B	
Char processor fail	341	C	B	
DCS main memory fail	343	C	B	
DCS mem parity error	282	A	A	
DCS power on	233	A	A	
DCS ROM read err	326	C	B	
Densitometer fail 1	242	A	A	
Densitometer fail 2	253	A	A	
Densitometer warn 1	335	C	B	
Density is too low	-	-	-	
Developer full	315	C	C	
Developer overfull	254	A	A	
Dev supply fail	214	A	A	
Developer short cct	243	A	A	
DMA failure	342	C	B	
Drum not in sync	244	A	A	
Drum top switch err	235	A	A	
Encoder edge error	270	B	A	
Encoder res error	271	B	B	
Erase lamp warn	309	C	C	
ES loop warn/fail 1	220	A	A	
	230	C	B	
ES loop warn/fail 2	221	A	A	
	321	C	B	
ES loop warn/fail 3	222	A	A	
	322	C	B	
ES loop warn 4	323	C	C	
ESM door reference	347	C	B	

ESM open door test F	231	A	A	
ESM shut door test F/W	229	A	A	
	306	C	B	
ESM supply failure	230	A	A	
External reg fail	344	C	B	
Firmware trap XX	-	F	D	
FOP out of range	-	-	-	
FOP peak used	-	-	-	
Front door is open	-	D	D	
Fuser circuit open	209	A	A	
Fuser switch short	264	B	A	
Fuser/PAMM fan fail	250	A	A	
High reflectance	252	A	A	
High screen V warn/fail	280	A	A	
	331	C	B	
High sim corona warn/fail	234	A	A	
	346	C	B	
High transfer I fail	227	A	A	
High ZOP, laser off	274	A	A	*
Hopper motor warn	311	C	B	
Illegal dev comb	-	-	-	
Illegal DCS command	255	A	A	
Illegal MCS command	249	A	A	
Illegal NVR # XX	278	B	D	
Interrupt fail X	-	F	A	
Invalid phtr target	313	C	D	
Invalid stepper pos	277	B	C	
Job active pwr fail	-	D	A	
Laser warning/failure	-	A	D	*
	302	C	B	*
Line overvoltage	-	D	D	
Low line voltage	-	D	D	
Low primary I warn/fail	225	A	A	
	325	C	B	
Low primary V warn/fail	224	A	A	
	324	C	B	
Low reflectance	245	A	A	
Low screen V warn/fail	226	A	A	
	330	C	B	
Low sim corona warn/fail	223	A	A	
	332	C	B	
Low transfer I fail	228	A	A	
Low transfer V fail	281	A	A	
MCS/DCS loop-back	213	A	A	
Mem controller fail	340	C	B	
No drum	268	B	A	
No FOP peak found	-	-	-	
No response from DCS	212	A	A	
No top of drum	251	A	A	
No Top of Stack	-	D	D	
Noisy signal gnd	232	A	A	
NVR failure	276	B	D	
Out of paper	-	D	D	
Output door is open	-	D	D	
Output paper misfold	-	D	D	
Overall illum warn	310	C	B	
Pad/area fail XX	307	C	B	
Paper jam	-	D	D	
Paper width sensor	312	C	B	
Preheat fail X	206	A	A	
Phtr area0 X	205	A	A	
Phtr I sensor X	308	C	B	
Phtr overtemp X	265	B	A	
Phtr temp sensor	262	B	A	
Prim cor supply 2	260	B	A	
Print lost on left	-	E	D	
Print lost on right	-	E	D	
Purge pump, fan fail	211	A	D	
RAM failure X X X X	-	F	D	
Ready for data	-	-	-	
Relay failure X	207	A	A	
Relay warning	314	C	C	
RF driver warning/failure	203	A	A	
	303	C	B	
RF driver stuck on	266	B	A	
ROM failure X X X X	-	F	D	
Scanner failure	204	A	A	

Scanner start fail	215	A	A
Simul cor supply 2	263	B	A
Stack safety switch	275	B	A
Stacker full (False)	-	D	D
Step phase error	272	B	A
Stepper init error	273	B	A
Stopped by operator (False)	-	-	-
Toner hopper low/empty		E	D
	-	D	D
Top of form error	-	E	D
Trfr cor supply 2	261	B	A
Triac/fuse X	208	A	A
Unrecoverable fault	-	B	D
Use custom shield	-	E	D
Use no shield	-	E	D
Use shield # X	-	E	D
Vacuum bag full	329	C	B
Vacuum System Fail	-	-	-
VDP Controller Error	-	-	-
Volume sensor warn	333	C	B
Waiting for data (False)	-	-	-
Warming up (false)	-	-	-
Wiper blade is up	283	A	A
+28V supply failure	247	A	A

* Message is eliminated when MCS firmware date code 2141 or greater is installed in the printer.

AC Contactor Short

This message occurs when current is measured by the firmware diagnostics at the ac contactor when the the ac contactor is presumed to be de-energized (open).

Possible cause:

a. AC Contactor (movement physically hindered)
b. Triac PCA
c. AC Power PCA
d. Control PCA
e. AC Power PCA Transformer

Recommended Procedure:

NOTE

Verify that all other error messages have been corrected prior to troubleshooting this message. Refer to the "Unrecoverable fault" message listed in this section of the manual.

a. Perform a printer reset (0 ENTER) from the printer's Operator Control Panel. If the message persists, proceed to step b.

b. With the printer's power disconnected, verify that all PCAs are seated, that the wiring is in good condition (not shorted or open), and that nothing is hindering the mechanical movement of the AC Contactor (refer to figure 6-5).

c. Visually observe DS1 on the AC Power PCA while powering up the printer. The illuminating of DS1 indicates that the MCP firmware is trying to energize the AC Contactor. If DS1 is NOT illuminated, yet the error persists (AC Contactor Short), the source of the error lies in circuitry after DS1.

d. Replace the following comonents is the order listed:

AC contactor
Triac (or Triac PCA)
AC Power PCA
AC Power PCA Transformer

AC triac short

This message occurs when greater than 20 counts are measured during the AC loads diagnostic when the loads are presumed to to be off. Use display command 188 (AC Loads Current with Loads Off) to verify the message.

Possible cause:

a. Loose ribbon connector (J7 of the AC Power PCA to J2 of slot 17 of the backplane)
b. AC Power PCA
c. Triac PCA
d. Control PCA
e. Developer motor SSR

NOTE

An "AC triac short" message may also be caused by an arcing primary corna assembly. Also some types of line conditioners and motor generators may also cause the error message to be displayed.

Recommended Procedure:

a. Ensure that all PCAs and ribbon connectors are seated properly (refer to figures 6-1 and 6-2).

b. Perform a hard Reset on the printer (toggle the Front Power Breaker OFF/ON) and visually verify that the following ac loads are off:

Erase lamp
Overall illumination
Purge pump and fan
Hopper motor
Fuser/PAMM fans
Developer motor

NOTE

To more easily view the lamp assemblies, initiate service tool command 676 (Enable High Voltage System) and open the printer front door within three seconds. This allows the printer front door to be open without de-energizing the AC Contactor. Close printer front door to exit the High Voltage enable mode.

If it is difficult to visually determine if the ac loads are OFF, perform the following procedures as needed.

1. Refer to figure 6-1 and 6-2; measure the following testpoints on the AC Power PCA to determine if the loads are being turned on by part of the control circuitry:

ON = Low
OFF = High

Erase Lamp	= TP38
Overall illumination Lamp	= TP36
Purge Fan/Pump	= TP35
Hopper Motor	= TP34
Fuser/PAMM Fans	= TP40

2. Refer to figure 6-8, if the Developer motor is on, measure the voltage across pins 3(+) and 4(-) of the Developer Motor SSR on the back of the EP panel. If the voltage measures 1 Vdc the SSR is shorted, replace the SSR. If the voltage is greater than +3 Vdc, replace the Control PCA.

ADC hung up

This message occurs when the analog/digital converter on the Monitor PCA fails to initiate its conversion.

Recommended procedures:

a. Reseat Monitor and MCP PCAs.
b. Replace Monitor PCA.
c. Replace MCP PCA.

A/D data invalid

This message occurs when the +5 volt reference from the Power Distribution PCA measures greater than 138 counts or less than 118 counts (2.7 Vdc and 2.31 Vdc). Initiate display command 195 (Reference Voltage) to verify the message.

Probable cause:

a. Monitor PCA
b. Power Distribution PCA

NOTE

All A/D measurements are made with respect to the +5 Vdc reference supply on the Monitor PCA. The +5 volt reference supply is used on on the Power Distribution PCA for under and over voltage protection; this same line is then routed to the Monitor PCA on a separate connector and compared with +5 volts which comes directly from the power supply. If any difference between these two five volt lines is detected, the MCP posts an error.

Recommended procedures:

a. Verify test point TP9 on the Monitor PCA measures +5 Vdc +/-.02 volts. If the measured value is not within this range, replace the Monitor PCA.

b. Verify test point TP14 on the Power Distribution PCA measures +5 Vdc +/- 0.2 volts. If the measured value is not within this range replace the Power Distribution PCA.

c. Verify that all PCAs and ribbon cables are seated properly (see figure 6-22 for Power Distribution PCA cabling).

Hints

Signal Path - J2-2 Power Distribution PCA - J7-3 Backplane - J1-16 Monitor PCA

Advisory condition

This message warns the operator of a possible failure. This message does not cause the printer to stop printing.

Recommended procedure:

a. The service representative should press 5 ENTER at the Service Control Panel to determine the nature of the advisory condition.

A/O modulator fail
A/O modulator warn

These messages occur when the measured difference of Zero Order Power (ZOP) with the Beam On and with the Beam Off is less than 50 counts . Initiate display commands 163 (ZOP, Beam On) and 164 (ZOP, Beam Off) to verify the "A/O modulator fail/warn" messages.

Probable cause:

a. Optics Casting
b. Monitor PCA

Recommended procedures:

a. Verify that the A/D converter on the Monitor PCA is working as follows:

   1. Measure test point TP16 (ZOP) on the Optics PCA while executing display command 163; this provides a measurement of ZOP with the Beam On. Measure test point TP16 while executing display command 164; this provides a measurement of ZOP with the Beam Off.

   2. Initiate service tool command 623. Compare the ZOP values measured with the values of ZOP displayed by the service tool command. If the values compare (in counts), the Monitor PCA's A/D converter is working properly.

      Note

      Use the A/D Conversion Table in Appendix A to convert the measured values of ZOP to count values.

Beam detect failure
Beam detect warning

These messages occur when the measured First Order Power (FOP) with the RF driver on, is equal to or less than 50 counts.

Possible causes:

a. Ribbon connector (J6 of Backplane to Optics PCA)
b. Laser/Power Supply and Power Supply Filter
c. Ribbon connector (J2 Slot 17 of Backplane to AC Power PCA)
d. Control PCA
e. AC Power PCA
f. Optics PCA
g. Optics Casting

Recommended procedures:

a. Verify that all ribbon connectors and PCAs are seated.

b. Recalibrate the laser, initiate service tool command 623. The the beam setting should be adjusted until the First Order Power "FXXX" reads between 90 to 95 counts.

c. Initiate the printer Self Test and verify that the laser power supply is being turned on at TP 49 on the AC Power PCA (see figure 6-1).

WARNING

Do NOT attempt to measure the voltage at the output of Laser Power Supply.

The following procedure may be used to isolate the problem, refer to figure 6-24:

NOTE

The scanner motor and the laser circuitry must be enabled before Beam Detect is generated; in addition, Beam Detect is used to enable the Video signal. The complexity of this closed loop system should be taken into consideration before troubleshooting.

a. Access the Optics PCA as follows:

1. Remove the right side panel of the printer; the panel is secured by two quarter-turn fasteners, one behind the toner hopper and one behind the upper left-hand corner of the back panel.

2. Loosen the 15 cross-hatched screws which secure the Optics PCA cover to the lower left-hand corner of the Optics Casting.

b. Perform the following commands to disable various diagnostic routines in the printer. The disabling of these diagnostic routines allow the printer to presume all circuitry is functioning correctly and therefore, that printing normal. This, will thereby provide the service representative the opportunity to check various testpoints within the Optics PCA circuitry.

Initiate 460 (Disable Optics Diagnostics)
430 (Disable Electrostatic Loop Diagnostics)
441 (Disable Reflectance Loop Diagnostics)

1. Initiate service tool command 622 (Calibrate Laser Power) while observing the signals on testpoints TP11 and TP 2 of the Optics PCA (Modulated Power Out and Modulated Power In). These signals should vary from 0 to 5 volts as the laser is calibrating.

2. Initiate service tool command 623 (Measure Optics Parameters) while observing the signals on testpoints TP 19, TP 17, and TP 18 (Beam Detect, Bean Detect NOT, and First Order Power). These signals should be similar to those shown on the bottom of figure 6-24.

3. Initiate the printer Self Test while observing the signal on testpoint TP 12 (Video). The signal should be similar to that shown on the bottom of figure 6-24 as the self test data is sent to the Optics PCA.

Cant maintain target

This message occurs if the density target is set too high for the printed output; i.e., the printed output contains several pages of material with a high percentage of print coverage (ratio of printed area to non-printed area). The print demand is greater than the the toner hopper's ability to keep up. The T Duty cycle value is greater than 32K or three drum rotations of the toner hopper.

Possible causes:

a. The Density Target is too high.

Recommended procedures:

a. The Operator should lower the Density Target via the 50 (Density Target) command.

Can't turn off +28V

This message occurs when the +28 volt power supply is measured at greater than 32 counts when the +28 Vdc supply is presumed to be off. Initiate display command 194 (+28 Supply Voltage) to verify the message. Normal count measured : 158 - When the supply on.
2 - When supply is off.

Possible cause:

a. Ribbon cables
b. Power Distribution PCA
c. +28 Vdc Power Supply (63312F-R03)
d. Control PCA
f. MCP PCA

Recommended procedures:

a. Verify all wiring between the Power Distribution PCA and the +28 Vdc Power Supply is in good condition (not shorted or opened) and that all ribbon connectors are properly seated.

b. Verify the +28 Vdc Power Supply as follows:

   1. Ground E4 "+ 28 Control" on the +28 Vdc Power Supply and measure the power supply's output. If the power supply was not turned off by the grounding of E4, replace the power supply.

c. Verify the +28 off control line (P2-45 Backplane) between the Control PCA and the Power Distribution PCA is not open or shorted as follows:

   1. Open the printer front door (this action disables the the +28 Vdc supply) while measuring testpoint E4 at the supply. The following measurements should be observed while opening and closing the front door:

      0.6 Vdc - Front door opened
      2.4 Vdc - Front door closed

      If the enable line does not work, replace the Power Distribution PCA and then the Control PCA.

Cardcage overtemp

This message is displayed when the cardcage temperature is greater than 196 counts. Use display command 197 (Cardcage temperature) to verify message. At count 205, the printer goes into HALT mode.

Probable cause:

a. Cardcage fan failure
b. Excessively dirty air filters
c. Room ambient temperature too high
d. DC Power PCA (temperature sensor)
e. Monitor PCA (A/D subsystem failure)

Recommended procedure:

a. Verify that all fans are operating correctly, refer to paragraph 5-7, Fan and Blower Operation in section V of the HP 2680A Service Manual.

b. Verify that the air filters are clean; replace if necessary.

c. Verify that the printer's operating environment is within the specifications established, refer to HP 2680A Site Preparation Guide (HP P/N 02682-90906).

d. Replace the DC Power PCA.

e. Replace the Monitor PCA.

Hints

The following table relates cardcage temperature in A/D counts to degrees:

A/D Counts	Degrees Celsius +/- 5	Fahrenheit +/- 9
165	27	81
170	30	86
175	33	91
180	35	95
185	38	100
190	40	104
195	42	108
200	45	113
205	47	117

Char processor failure

This message is displayed when the Character Processor diagnostic has failed.

Possible cause:

a. Character Processor PCA
b. Print Control PCA
c. DCS I/O PCA
d. Data Processor PCA

Recommended procedure:

a. Execute all data control system memory diagnostics (service tool commands 610 through 619), refer to section III of the Service Manual. If all diagnostics run successfully and the error message persists, replace PCAs in the order listed.

DCS main memory fail

This message is displayed when the DCS main memory diagnostic fails. The "D" status LED on the Memory Controller PCA illuminates for single bit memory errors. The "E" status LED illuminates for multiple bit memory errors.

Probable cause:

a. Front Plane Connectors
b. Memory Arrays
c. Memory Controller PCA
d. Data Processor PCA

NOTE

Do not perform a power-on or system reset. These actions clear the memory controller error log which contains information about the parity error.

Recommended Procedure:

a. Initiate service tool command 619 (Dump DCS Memory Error Log) to display faulty memory chip information. Refer to DCS Self Test Diagnostics in section III of the HP 2680A Service Manual. If more than five chips are indicated as faulty on one Memory Array, replace the array.

b. If the error message persists, replace the PCAs in the order listed under possible cause.

DCS mem parity error

This message is displayed when a DCS main memory parity error is detected. Multiple bit parity errors are uncorrectable.

Probable cause:

a. Front Plane Connectors
b. Memory Arrays PCAs
c. Memory Controller PCA

Recommended procedure:

Note

Do not perform a power-on or system reset. These actions clear the memory controller error log which contains information about the parity error.

a. Initiate service tool command 619 (Dump DCS Memory Error Log), refer to section III of the Service Manual.

b. If the error message persists, replace the PCAs in the order listed under possible cause.

DCS power on

This message is displayed whenever the DCS operating system attempts to initialize any time other than during initial power on or system reset.

Possible cause:

a. DCS I/O PCA
b. Data Processor PCA
c. Print Control PCA
d. Machine Control Processor PCA

Recommended procedure:

a. Execute all data control system memory diagnostics (service tool commands 610 through 619), refer to section III of the HP 2680A Service Manual.

b. If all diagnostics run successfully and the error message persists, replace PCAs in the order listed under possible cause.

DCS ROM read err

This message is displayed when a checksum error is detected during the reading of the default character set PROMs.

Possible cause:

a. Integrated Circuits U58, U68 on the Data Processor PCA
b. Data Processor PCA

Recommended procedure:

a. Initiate service tool command 610 (DCS Self Test,Host Connected) and service tool command 611 (DCS Self Test, Host Disconnected), refer to section III of the Service Manual.

b. Replace the Data Processor PCA.

Densitometer fail 1

This message is displayed whenever the clean drum measurement is less than 600 counts. Initiate display command 225 (Clean Drum Measurement) to verify message.

Possible cause:

a. Densitometer Assembly
b. Monitor PCA
c. Ribbon cable (Densitometer Assembly to J10 of the Backplane)

Recommended procedures:

Note

Ensure the wiper blade is down when performing the Clean Drum Routine.

a. Ensure that all PCAs and ribbon cables are properly seated (refer to figure 6-21).

b. Verify densitometer operation and adjustment. Refer to Densitometer PCA Adjustment in section IV of the HP 2680A Service Manual.

c. If the error message persists, replace the assemblies in the order listed as a possible cause.

Densitometer fail 2

This message is displayed when the densitometer LED current is less than 128 counts or greater than 230 counts. Use display command 129 (Densitometer LED Control Voltage) to verify message.

Possible cause:

a. Densitometer Assembly
b. Monitor PCA
c. Ribbon connector (Densitometer Assembly to J10 of backplane)

Recommended procedure:

a. Follow the recommended troubleshooting procedure listed for the "Densitometer fail 1" error message.

Densitometer warn 1

This message is displayed when the clean drum reflectance is equal to or greater than 765 counts.

Possible cause:

a. Monitor PCA
b. Densitometer Assembly

Recommended procedures:

a. Recalibrate the densitometer gain (see Densitometer PCA Adjustment in section IV of the Service manual).

Density is too low

This message is displayed if insufficient development is taking place during the New Drum/Wiper Routine (service tool command 661). Insufficient development is a reflectance measurement of less than 75 counts.

Hints

Remove the paper from the printer and inspect the drum under the densitometer assembly. If heavy development is occuring on the drum (toner), the problem is probably not related to a faulty densitometer.

Recommended procedures:

a. Verify the densitometer is correctly adjusted, refer to Densitometer PCA Adjustment in section IV of the Service Manual.

b. Display the following parameters and verify the settings are valid (refer to the last Self Test print-out):

1.	Primary corona setting	(display command 231)
2.	Simultaneous corona setting	(display command 241)
3.	Developer bias setting	(display command 236)
4.	Laser setting	(display command 261)

c. Enable and display the following loads to verify their operation:

1.	Primary corona	- 731 (Device On)	- 131 (Display)
2.	Simultaneous corona	- 741 (Device On)	- 141 (Display)
3.	Developer bias	- 736 (Device On)	- 136 (Display)
4.	Optics	- 823 (Measure Optics Parameters)	

Developer full
Developer overfull

The "Developer full" message occurs when the average developer volume is between 189 to 210 counts (initiate display command 134, Average Developer Volume, to verify the message). The "Developer overfull" message occurs when the average developer volume is greater than 210 counts. The latter message results in stopping the printer.

Possible causes:

a. The developer assembly is too full.
b. Defective Developer Volume Sensor (DVS)
c. DVS circuitry (Monitor PCA)
d. Developer Magnet Angle out of adjustment

NOTE

Because the composition of the developer mixture is ferro-magnetic and therefore conductive, the developer volume sensor is capable of measuring the volume of developer mixture in the developer assembly.

NOTE

An "Developer full" message may also be caused by an arcing primary corona assembly.

Recommended procedure:

a. Verify that the developer assembly is not too full as follows:

   1. Remove the developer assembly from the printer (refer to paragraph 5-12 of the Service Manual).

   2. The DVS is located on the inside rear wall of the developer housing near the developer drive gears. Under normal operating conditions the DVS is usually only about half covered with developer mixture. Verify that the developer mixture is not completely covering the sensor. If the sensor is covered remove some of the mixture, re-install the developer assembly, and perform the Developer Run-In routine (refer to paragraph 5-17 of the the Service Manual.

b. The DVS circuitry may be verified as follows (refer to figure 6-8A):

   1. Remove the developer assembly and fill the cavity in front of the DVS with developer mixture. Re-install the developer assembly and intiate display command 135 (Instantaneous Developer Volume); if the sensor is working correctly, the count should be approximately near 240.

      Remove the developer assembly and remove all developer mixture from in front of the DVS. Re-install the developer assembly and initiate display command 135 (Instantaneous Developer Volume). If the sensor is working correctly the count should read near zero.

      Perform the Developer Run-In routine.

c. Verify that the developer magnet angle alignment is correct (refer to paragraphs 5-12 through 5-14 of the Service Manual.

Dev supply fail

This message is displayed when the developer voltage is less than 100 counts and the door bias voltage is less than 20 counts. Initiate display command 119 (Multiple ESM Display) to display the developer bias voltage (D=xxx) and the developer door bias (B=xxx).

Possible cause:

a. Fuse F4 on the High Voltage Supply PCA
b. Monitor PCA
c. High Voltage Supply PCA

Recommended procedures:

a. Initiate device on command 736 (Developer Bias, enable) and then display command 136 (Developer Voltage); note if the error message persists.

NOTE

The normal developer bias voltage should be approximately 190 counts.

b. Initiate display command 194 (+28V Supply Voltage) and verify the power supply measures greater than 148 counts.

c. Verify fuse F4 on the High Voltage PCA is not open.

d. Verify that all wiring in the developer bias circuitry is in good condition (not pushed pins or, cut and or frayed wires); see figure 6-15.

Developer short cct

This message is displayed when the developer voltage is less than (2 X the developer bias setting) - 287. Initiate display commands 136 (Developer Voltage) and 236 (Developer Bias Setting) to verify the message.

NOTE

The displayed voltage is proportional to, but not equal to the voltage on the developer.

Recommended procedures:

a. Initiate device on command 736 (Developer Bias, enable). Verify that the error message is valid by displaying the developer voltage (display command 136) and comparing it to the calculated error message limit (two times the bias setting minus 287).

b. Perform service tool command 676 (Enable High Voltage System) and open the printer front door.

NOTE

The front door must be open within three seconds after entering the command.

Press 1136 at the Service Control Panel to continuously display the developer voltage.

c. Open the toner hopper. If the developer voltage increases above the limit, the toner hopper is probably the source of the error message; investigate. If the voltage does not change, proceed to step d.

d. Disengage the developer assembly by turning clockwise on the Developer Engage Control Lever while monitoring the developer voltage. If the voltage increases above the limit, a developer short probably exists between the developer top seal and the drum. Remove and clean the developer assembly and seal. Refer to section IV of the HP 2680A Service Manual. If the short persists, proceed to step e.

e. Remove the Developer Motor (see Section IV of the service manual) and clean the output drum drive gear. This gear should be isolated from frame ground.

f. Unplug the developer assembly connector while monitoring the developer voltage. If the developer voltage changes, the short may exist between the developer assembly or tray, and the frame; proceed to step f. If the voltage does not change, proceed to step g.

f. Inspect the developer top seal rollers and the right and left mylar seals; replace if they appear worn or damaged.

g. Remove the developer table, developer engaging assembly, and control lever (8 screws). Clean the base of the EP cavity and the table assembly.

h. Replace High Voltage Supply PCA.

DMA failure

The direct memory access controller failed the DCS Self Test diagnostic.

Possible cause:

a. DCS I/O PCA
b. HP-IB internal ribbon cable
c. HP-IB interconnect cable (front plane)
d. Memory Controller PCA
e. Data Processor PCA

Recommended procedure:

a. Ensure that the DCS I/O PCA and ribbon connectors are properly seated.

b. Perform service tool command 615 (Direct Memory Access) to verify the error message. Refer to section III of the Service Manual.

c. Replace the assemblies in the order listed as a possible cause.

NOTE

The DMA Controller diagnostic tests the PHI chip in a wrap around mode, but does NOT test the HP-IB bus transceivers, the HP-IB ribbon cable (internal), or the HP-IB external connect cable.

Drum not in sync

This message is displayed when the top of drum signal is not present or occurs at the wrong time.

Possible cause:

a. Tucked or stuck drum wiper blade
b. Top of Drum Switch
c. Fuses F1 through F4 on the DC Power PCA
d. DC Power PCA
e. Drum Drive Motor
f. Control PCA
g. Drum Drive Transformer

Recommended procedure:

a. Verify the photoconductive drum/wiper blade pressure adjustment (refer to section IV of the HP 2680A Operator's Handbook).

b. Verify that the drum is turning, as follows:

1. Initiate service tool command 676 (Enable High Voltage) System) and open the printer's front door.

NOTE

The printer front door must be open within three seconds after initiating this command.

2. Initiate device on command 701 (Vacuum Motor Enable) and 702 (Drum Drive Motor Enable). Visually inspect to see if the drum is turning.

If the drum is not turning, proceed to step d. If the drum is turning, proceed to step c.

c. If drum motion is not being detected, investigate the operation of the following:

1. Top of Drum Sensor and its wiring (refer to drawing).
2. Control PCA
3. Machine Control Processor PCA (Top of Page Synchronization Circuitry)

d. If drum motion is not occuring, verify the following:

1. Ensure that drum motion is not being hindered i.e., tucked wiper blade, paper, etc.

2. Ensure that both drum bearings are in place and that the drum engages on the drum drive gear pin.

3. Verify that fuses F1 through F4 on the DC Power PCA are not open (these fuses supply the voltages to drive the drum drive circuitry).
4. Refer to figure 6-7 and verify that all the components in the drum drive circuitry are in place (all connectors secure with no broken or frayed wires) and are operational. The following assemblies comprise the drum drive circuitry:

(a) Control PCA
(b) DC Power PCA
(c) Drum Drive Transformer
(d) Drum Drive Motor
(e) Drum Drive Capacitor
(f) Drum Brake Capacitor and related circuitry

Drum top switch err

This message occurs when the Top of Drum signal occurs outside the expectant time window.

Possible cause:

a. Drum locked at top of drum position.
b. Top of Drum switch (shorted)
c. Control PCA

Recommended procedure:

a. Verify the drum is turning, refer to the recommended procedure given for "Drum not in sync".

b. Verify that the Top of Drum switch is correctly wired and operating correctly.

Encoder edge error

The paper stepper tachometer (encoder) output did not change (TTL Level) as the paper is advanced.

Possible cause:

a. Paper input stepper encoder
b. Control PCA
c. Fuses F2 and F3 of the DC Power PCA
d. DC Power PCA
e. Input Tractor Stepper Motor

Recommended procedure:

a. Verify the stepper encoder is turning, as follows:

   1. Remove the printer rear panel.

   2. Remove the encoder cover plate (refer to the Input Stepper Registration Alignment procedure in the HP 2680A Service manual for cover plate location).

   3. Visually observe the encoder while depressing the PAPER FORWARD key.

      If the encoder is turning forward, proceed to step b.
      If the encoder is NOT turning, turning the wrong direction, or is weak (low torque), proceed to step c.

b. Encoder movement is not being detected, verify the operation of the encoder detection circuitry on the following PCAs (see Stepper Motor circuitry in section VI of this manual).

   1. Encoder Sensor and Stepper Encoder PCA
   2. Sensor PCA
   3. Control PCA

c. Encoder movement is not occurring, verify the following:

   1. That nothing is hindering encoder disc movement.

   2. That the encoder disc is securely attached to the encoder shaft.

   3. Verify that Fuses F2 and F3 (+12 and -12 Vdc supplies) on the DC Power PCA are not open.

   4. Investigate the operation of the following (refer to the Stepper Motor circuitry figure 6-9).
      (a) Input Stepper Motor
      (b) DC Power PCA

(c) Control PCA
(d) All associated connectors and cabling

Encoder res error

This message is displayed when a paper stepper encoder resolution error is detected. A fixed relationship between the paper encoder output and the stepper motor step number count must exist so that the paper can be moved at an known rate. If this relationship is lost, an error is displayed.

Possible cause:

a. Loss of paper stepper registration
b. Paper Jam

Recommended procedures:

a. Re-initialize the input paper steppers, refer to Input Stepper Registration Alignment in section IV of the Service Manual.

b. Verify the paper stepper encoder is securely mounted to the paper stepper drive motor.

c. Verify that the input tractor movement is not inhibited.

NOTE

When loading paper in the printer, ensure that it is positioned directly under the splice table and parallel to the input tractors so not to cause any "pull" on the input tractors. It is advisable to remove the paper from its container when loading it into the printer.

d. Refer to recommended troubleshooting procedure given for the "Encoder edge error" message.

Erase lamp warn

This message is displayed when the erase lamp current is less than 33 counts. Initiate display command 180 (Erase Lamp Current) while executing the printer Self Test to verify the message.

Possible cause:

a. One or more defective erase lamps.
b. Damaged lamp assembly edge connector
c. Triac PCA
d. AC Power PCA
e. Control PCA

Recommended procedure:

NOTE

Ensure the AC contactor is operating properly before executing the erase lamp diagnostics. If not refer to "AC Contactor Malfunctions" in section 2-2 of this manual.

a. Verify that the ribbon cable from J7 of the AC Power PCA to J2 Slot 17 of the backplane is properly seated and there are no shorted or opened wires.

b. Verify the wiring from the AC Power PCA to the erase lamp connector is properly seated and there are no shorted or opened wires).

c. Verify lamp operation as follows:

   1. Initiate service tool command 676 (Enable High Voltage System) and open the printer front door.

      NOTE

      The printer front door must be opened within three seconds of initiating this command.

   2. Initiate device on command 722 (Erase Lamp On) to illuminate the erase lamp assembly. Visually observe if all lamps are illuminated. If any lamps are defective, replace all ten lamps.

      If the error message persists after the defective lamps have been replace, proceed to step 3.

   3. Inspect the lamp assembly's edge connector; replace assembly if connector contact pins are worn.

   4. Remove printer rear panel and check lamp assembly wire connectors.

   5. Interchange the erase lamp and overall illumination assemblies. If the "Overall illum warn" message is displayed, the problem has followed the assembly. Change the lamp assemblies back to their original positions and replace all lamps in the erase lamp assembly.

d. If the erase lamps fail to turn on, initiate device on command 722 (Erase Lamp On) while measuring test point TP38 on the AC Power PCA. If the test point measures a logic low (less than 0.4 Vdc), replace the AC Power PCA. If the test point measures +5 Vdc, the Control PCA or the AC Power PCA may need to be replaced.

ES loop fail 1
ES loop warn 1

These messages occur when the primary corona setting is operating at the maximum primary corona setting (255) and the simultaneous corona is operating at a value within its normal operating range (64 to 255). Initiate display commands 231 (Primary Corona Setting) and 233 (Maximum Primary Corona Setting) to verify the messages.

Possible causes:

a. Broken corona wires
b. Contaminated corona wires
c. Improperly strung corona wires
d. Defective endblocks
e. Damaged primary corona connector cable
f. High Voltage PCA
g. Photoconductive drum

NOTE
For secondary causes refer to the "ES loop fail 2" error message.

Recommended procedures:

NOTE

Verify that all other process error messages have been corrected before proceeding.

a. Place the Front Power Breaker to the OFF position, open the printer front door, and remove the primary corona assembly.

   1. Visually inspect the primary corona for signs of electrical discharge or for electrical arcing.

   2. Inspect corona assembly for damaged or broken wires; restring wires if detected.

   3. Inspect primary corona wires and primary screen for contamination; clean if necessary.

   4. Verify that the primary corona interconnect wires are not too long and/or bent up touching the primary corona grid.

   5. Verify the resistor endblock connector as follows:

      (a) Visually inspect connector for any signs of electrical breakdown.

      (b) Verify the resistance from the connector ball to the "D" washer is approximately 100 K ohms.

b. Visually inspect the high voltage connector from the High Voltage Supply PCA to the primary corona assembly connector for signs of damage or electrical breakdown.

c. Verify that the electrostatic monitor assembly is operating correctly; proceed as follows:

   1. At the Service Control Panel press 701 ENTER, 702 ENTER, 731 ENTER and then RUN. This sequence of commands enables the vacuum motor, drum drive motor, and the primary corona.

   2. Allow approximately ten seconds to elapse and press HALT. Press 674 ENTER (Take ESM Reading). A high positive should be observed at this time if the ESM is working correctly (this being the result of the primary corona's affect on the drum's surface).

3. Press 831 ENTER (Primary Corona, disable), 741 ENTER (Simultaneous Corona, enable) and RUN.

4. Allow approximately ten seconds to elapse and press HALT. Press 674 ENTER (Take ESM Reading). A negative charge should be measured at this time if the ESM is working correctly (this being the result of the simultaneous corona's affect on the drum surface).

d. Execute printer Self Test and inspect the self test diagnostic printout. If the "Dark poten = XXX" count is 20 counts or more greater than the "Doc poten DD= XXX" count, replace the drum.

ES loop fail 2
ES loop warn 2

These messages occur if the simultaneous corona setting is at the upper limit (255) while the primary corona setting is operating at a stable value within its operating range (128 to 255)..

Possible cause:

a. Damaged or broken simultaneous corona wire
b. Contaminated simultaneous corona wire
c. Defective endblock
d. Damaged high voltage connector cable
e. Low power or beam misalignment
f. Simultaneous power supply transformer

NOTE

For secondary causes, refer to the "ES loop fail 1" error message.

Recommended procedure:

NOTE

Verify that all other process error messages have been corrected before proceeding.

a. Place Front ON/OFF switch to the OFF position, open printer front door, and remove the simultaneous corona assembly.

1. Visually inspect simultaneous corona assembly for signs of electrical discharge or arcing.

2. Inspect corona wires for damage; if damaged or broken replace.

3. Inspect simultaneous corona wires and simultaneous grid for contamination; clean if necessary.

4. Verify the resistor endblock as follows:

(a) Visually inspect connector for any signs of electrical breakdown.

(b) Verify the resistance from the connector ball to the corona wire "D" washer is approximately 100 K ohms.

b. Verify the simultaneous power supply transformer is correctly installed and that all connections to and from the transformer are in good condition (not shorted or open).

ES loop fail 3
ES loop warn 3

These messages occur if the primary and simultaneous corona settings are at their limits.

For possible causes and recommended troubleshooting procedures, see the "ES loop fail 1" and the "ES loop fail 2" messages.

ES loop warn 4

This message occurs if during printer startup, the drum potentials are not achieved (within ten counts of their target) within ten drum rotations.

Possible cause:

a. Any problem associated with an "ES loop warn/fail 1 and 2" error.
b. Rapid ambient room temperature change.
c. Corona contamination
d. Defective drum
e. Low Beam Power

Recommended procedure:

a. Allow printer to run; the problem is likely to correct itself after a short interval of time.

b. Initiate the printer Self Test; compare all parameters listed on the diagnostic print-out with those from a known good diagnostic print-out.

c. Clean the corona assemblies.

d. Verify the operation of the electrostatic monitor, see step d in the ES loop warn troubleshooting procedure.

e. Investigate all possible problem areas associated with other ES loop warn/fail problems.

ESM door reference

This message occurs when the electrostatic monitor door bias voltage is either greater than 100 counts or less than 40 counts. Initiate display command 119 (Multiple ESM Display, B=door bias) to verify message.

Possible cause:

a. Electrostatic Monitor Assembly
b. High Voltage Supply PCA
c. ESM Probe Connector

Recommended procedure:

a. Verify the ESM power supply cable from the High Voltage Supply PCA to electrostatic monitor assembly is in good condition (no short or open wires).

b. Verify the electrostatic monitor operation, see step d of the ES loop warn/fail troubleshooting procedure.

c. Remove the electrostatic monitor assembly and execute the printer Self Test. Initiate display command 119 (Multiple ESM Display). If the door bias measurement (BXXX) is within the 40 to 100 count range, the problem is probably with the ESM assembly. If the measurement is outside the operating range (40 to 100) the source of the problem is either with the wiring J3 of the High Voltage Supply PCA to the ESM Probe Connector or the High Voltage Supply PCA (see figure 6-16).

ESM open door test F

This message occurs when the ESM control voltage does not exceed 50 counts. Initiate display command 119 (Multiple ESM Display, C = Control Voltage) to verify message.

Possible cause:

a. Electrostatic Monitor
b. Monitor PCA
c. DC Power PCA
d. ESM solenoid, solenoid shaft and linkage
e. Control PCA
f. ESM Cable assembly

Recommended procedure:

NOTE

Verify the ESM connector is installed to J1 of the Monitor PCA and that all pins are making good contact to the assembly and the mounting rail.

a. Initiate service tool command 674 (Take ESM Reading) and visually verify if the ESM solenoid is being activated.

NOTE

The ESM solenoid is located to the left of drum drive motor. Enter the command and press the RUN key while observing the solenoid.

1. If the ESM solenoid is NOT activated, disconnect the solenoid and verify the solenoid control signal (J2-6 DC Power PCA) is being initiated (+12 = On). Replace the DC Power PCA if solenoid control is not present.

2. If the solenoid control is present and the solenoid is correctly aligned and adjusted but still does not operate correctly; replace the solenoid.

b. Replace the ESM assembly.

c. Replace the Monitor PCA.

ESM shut door test F
ESM shut door test W

These messages occur when the ESM measurement is not within six counts of the door bias voltage. Initiate display command 1119 (Multiple ESM Display, E=ESM Measurement, B=Door Bias Voltage) to verify the message.

Possible cause:

a. ESM assembly
b. ESM Solenoid and solenoid spring, shaft, and linkage
c. Monitor PCA
d. High Voltage Supply PCA

NOTE

Ensure that the ESM connector is installed on J1 of the Monitor PCA and that the J5 connector is installed on the High Voltage Supply PCA. Ensure that the mounting rail connector is in good condition and that all pins are making good contact.

Recommended procedure:

a. Verify the Electrostatic Monitor assembly is properly installed (seated) in the printer.

b. Ensure that the door bias cable (J3 of the High Voltage Supply PCA) to Electrostatic Monitor is seated and in good condition.

c. If the message persists, replace the components in the order listed as possible cause.

ESM supply failure

This message occurs when the Electrostatic Monitor power supply fails. The power supply is located on the Monitor PCA.

Possible cause:

a. Fuses F1 and F2 on the Monitor PCA
b. Monitor PCA

NOTE

Ensure that the ESM connector is install to J1 of the Monitor PCA.

NOTE

LED DS1 on the Monitor PCA is illuminated when the ESM power supply is operational.

Recommended procedure:

a. Verify that fuse F1, the +12 Vdc input voltage for the Monitor PCA, is not open.

b. Verify that fuse F2, the -12 Vdc input voltage for the Monitor PCA, is not open.

NOTE

If the fuses are open, verify that there are no short circuits between the ESM cable and ground (see figure 6-16 for correct cable wiring).

c. Replace the Monitor PCA.

d. Replace Machine Control Processor PCA (4.8 KHz clock).

External reg fail

This message occurs when the DCS External Self Test Diagnostic fails. Initiate service tool command 613 (DCS External Register Diagnostic) to verify the message.

Possible cause:

a. Data Processor PCA

Recommended procedure:

a. Initiate all DCS Self Test Diagnostics (service tool commands 610 through 619) refer to section III of the HP 2680A Service Manual.

b. Replace the Data Processor PCA.

Firmware trap XX

A firmware error has been detected.

Possible cause:

a. MCP PCA

Recommended procedure:

a. Record firmware trap error number in printer maintenance log.

b. Reset the printer by toggling the Front ON/OFF switch.

c. Initiate service tool command 671 (Display RAM Location).

    1. If the "Firmware trap XX" message persists, replace the MCP PCA. All error message information should be recorded and returned with the failing PCA.

FOP out of range

This message occurs if during the RF Modulator Calibration routine, the first order power (FOP) is measured at greater than 255 counts.

Possible cause:

a. Optics PCA
b. Laser Power Supply
c. Laser
d. Monitor PCA

Recommended procedure:

a. Measure test point TP18 on the Optics PCA while initiating service tool command 623 (Measure Optics Parameters). Compare the FOP value measured with the value for FOP being displayed by the service tool command (use the A/D Conversion Table in Appendix A).

1. If the values do NOT compare, the Monitor PCA A/D subsystem is not correctly converting the FOP to a representative digital value; replace the Monitor PCA.

2. If the values DO compare and the "FOP out of range" error message persists, replace the assemblies in the order listed.

b. Refer to the recommended troubleshooting procedure listed for the "Beam detect warning" failure message.

FOP peak used

This message occurs when the requested laser power level is not achieved during RF Modulator Calibration.

Possible cause:

a. Laser Assembly
b. Beam Setting misadjusted
c. Optics PCA

Recommended procedure:

a. Initiate service tool command 622 (Calibrate Laser Power).

b. Execute service tool command 623 (Measure Optics Parameters). Adjust the beam setting to a value which provides a First Order Power ("FXXX") level, of between 90 to 95 counts.

c. Refer to the recommended troubleshooting procedure listed for the "Beam detect warning" failure message.

Front door is open

This message occurs when the printer senses the front door is open.

Possible cause:

a. Front door is not securely latched
b. Faulty front door switch.
c. Control PCA

Recommended procedure:

a. Ensure that the printer front door is securely latched (i.e. contact is being made on the interlock prongs).

b. Verify the front door switch is correctly wired (plugged in) and that the wires are not shorted or open.

NOTE

To access the front door switch remove the two screws on the left-hand wall of the corona cleaning tool storage area.

c. Verify the front door driver control is functioning correctly. If the "Front door is open" message persists after verifying steps a and b, replace the Control PCA.

Fuser circuit open

This message occurs when the fuser current is measured at less than 32 counts when the fuser is presumed to be on.

NOTE

A typical fuser current measurement is approximately 200 counts while printing.

Possible cause:

a. Fuser contacts and Fuser lamp
b. Triac (Q8)
c. Current sensor failure (Triac PCA)
d. AC Power PCA
e. Control PCA

Recommended procedure:

a. Initiate device on command 775 (Fuser on for 2 seconds) to verify if the fuser is turning on (illuminating).

NOTE

To more easily observe the fuser, remove the the printer backpanel and observe the fuser from the back of printer while initiating the device on command.

b. If the fuser did not illuminate, place the rear MAIN POWER breaker to the OFF position and disconnect fuser connector (the two pin center connector), located above the AC Power PCA.

1. Inspect the fuser bulb contacts for burned or pitted areas; clean if necessary. Verify that the contact "spring tension" is sufficient enough to hold the fuser bulb securely in position. A loose bulb may result in excessive heat build-up at the bulb/contact surface. If the contacts can not be throughly cleaned or if the "spring tension" is weak, replace the contacts.

NOTE

The resistance between pins 1 and 2 of the fuser connector should approximately 3 ohms.

2. Reseat fuser bulb and re-intiate the device on command on command.

c. Measure test point TP31 "Fuser" on the AC Power PCA while initiating device on command 775. The measured output should be negative going square waves.

1. If pulses are present and the error persists, proceed as follows:

(a) Verify that all the connectors between J4 of the Triac PCA and Q8 on the Triac Bracket are seated. (see figure 6-1). Ensure that the Fuser Bracket connector (see figure 5-3) is fulled seated and that the wires are not shorted or open.

(b) Replace triac Q8 on the Triac Bracket (the triac connected to J10 on the Triac PCA).

(c) Replace the AC Power PCA.

(d) Replace the Triac PCA.

2. If no pulses are present and the error persists, proceed as follows:

(a) Verify the ribbon connector between J2 Slot 17 of the backplane and J7 of the AC Power PCA is seated.

(b) Replace the Control PCA.

(c) Replace the AC Power PCA.

Fuser switch short

This message occurs when the fuser current is greater than 32 counts when the fuser is presumed to be off.

Possible cause:

a. AC Power PCA
b. Control PCA
c. Monitor PCA
d. Triac PCA
e. ANY TRIAC on the Triac Bracket (Q8 or Q9 most probable)

Recommended procedure:

a. Ensure that all PCAs and ribbon cables are properly seated (see figure 6-4 for fuser system circuitry).

NOTE

It may be necessary to Reset the printer (press 0 ENTER). This allows the AC contactor to be closed until the error condition is sensed. This provides the service representative an opportunity to view the fuser.

b. Remove the printer backcover and run Self Test. Observe if the fuser is on (illuminated). If the fuser is ON, proceed to step c. If the fuser is NOT on proceed to step d.

c. Replace the following assemblies in the order listed:

NOTE

It is recommended that all Triacs on the Triac Bracket be replaced at one time since the effects of one bad triac (excessive noise on a common line) is difficult to detect.

1. Triac Q8 on the Triac Bracket
2. All Triacs on the Triac Bracket
3. AC Power PCA
4. Control PCA

d. Place the printer Front Power Breaker to Off. Connect a jumper to short TP17 to TP18 on the Triac PCA. Restore printer power.

1. If the "Fuser switch short" message does NOT occur, replace the Triac PCA.

2. If the "Fuser switch short" message persists, proceed to step e.

e. Replace the following PCAs in the order listed.

1. AC Power PCA
2. Control PCA
3. Monitor PCA

Fuser/PAMM fan fail

This message is displayed when the fuser/PAMM fan current is less than 81 counts. Initiate display command 182 (PAMM and Fuser Fan Current) to verify the message.

Possible cause:

a. Loose or disconnected ribbon cables
b. Faulty fans

c. Triac PCA
d. AC Power PCA
e. Control PCA

Recommended procedure:

a. Ensure that all ribbon cable connectors and that the AC Power and Triac PCAs are seated properly.

b. Initiate device on command 776 (Fuser/PAMM Fans and Chainbox motor) and visually inspect the three PAMM fans, fuser fan, and chainbox are operational.

   1. Replace the fans that are not operating.
   2. If NONE of the fans are operating, proceed to step c.

c. Measure the voltage at test point TP40 on the AC Power PCA while initiating device on command 776.

   1. If test point TP40 measures a logic low (less than 0.4 volts), replace the the following PCAs in the order listed.

      (a) AC Power PCA
      (b) Triac PCA

   2. If test point TP40 measures a logic high (+5.0 volts), replace the following PCAs in the order listed.

      (a) Control PCA
      (b) AC Power PCA

High reflectance

For standard density printers this message occurs when the average reflectance is at least 60 counts over target and the toner hopper empty bit is NOT set. For printers with the variable density option, message occurs when the average reflectance is greater than a pre-set value for a given density target.

Possible cause:

a. Toner hopper is empty
b. A toner bridge in the hopper is preventing toner from exiting the hopper.
c. Malfunctioning toner hopper (excessively worn)
d. Developer Assembly binding
e. Developer Motor Drive Circuitry
f. Transfer Solenoid always engaged

Recommended procedure:

a. Stir the contents of the toner hopper or add toner to the hopper, if empty. Press 441 ENTER (disable Reflectance Diagnostics) and then press 1125 ENTER (display Average Reflectance). Allow the printer to run (either printing actual data or Self Test) until the average reflectance is within 60 counts of the reflectance target. Enable the reflectance diagnostics (541 ENTER) and continue normal operation.

b. Initiate device on command 724 (Toner Hopper) to verify the operation of the toner hopper.

   If the toner hopper does NOT run:

   1. Verify that all toner hopper wiring is correct and in good condition, no shorted or opened wires (see figure 8-2).
   2. Verify that the toner hopper microswitch is being closed (activated).
   3. Measure test point TP34 on the AC Power PCA to determine if the toner hopper is being turned on:

ON = less than 0.4 Vdc
OFF = +5 Vdc

c. To verify if the toner hopper is operating adequately (the gears are not binding or broken), perform the following steps:

   1. Initiate command 678 (enable high voltage system) and open the printer front door. Press 1 ENTER RUN at the printer control panel to run a continuous Self Test.

   2. Visually observe the end of the metering drive shaft while the printer is printing. The end of the shaft is located on the toner hopper housing to the upper right-hand side of the toner hopper spout. The end of the shaft is slotted and surrounded by a large white bushing.

      Under normal operation, the shaft should rotate between eight to nine times a minute. While printing count the number of rotation the shaft makes in one minute. Observe if the shaft starts and stops without any indication of binding or slipping.

      If the shaft is not rotating or is binding and/or slipping, replace the toner hopper.

d. Initiate device on command 735 (Developer Motor) to verify the operation of the developer motor.

   If the motor does NOT run:

   1. Verify that nothing is hindering the movement of the developer roll.

   2. Verify the operation of the developer motor drive circuitry (see figure 6-8).

High screen V fail
High screen V warn

These messages occur when the primary screen voltage is greater than (1.5 X the primary corona setting) - 95. Initiate display command 133 (Primary Screen Voltage) and 231 (Primary Corona Setting) to verify the message.

Possible cause:

a. Primary Screen PCA
b. High Voltage Supply PCA
c. Monitor PCA (faulty A/D subsystem)

Recommended procedure:

a. Place printer's Front Power Breaker to the OFF position and remove the primary corona assembly.

   1. Visually inspect corona wire and corona screen for signs of arcing and for excessive contamination.

   2. Clean corona wires and corona screen.

b. If "High screen V warn/fail" message persists, replace the following items in the order listed.

   1. Primary Corona Assembly
   2. Primary Screen PCA
   3. High Voltage Supply PCA

High sim corona warn
High sim corona fail

These messages occur when the simultaneous current is 32 counts greater than the expected count. The expected simultaneous current count is (5/4 times the Simultaneous Setting) - 64. Initiate display commands 141 (Simultaneous corona current) and 241 (Simultaneous Corona Setting) to verify these messages.

Possible causes:

a. Simultaneous Corona Assembly
b. High Voltage Supply PCA
c. Simultaneous Transformer Assembly

Recommended procedure:

a. Place printer's Front Power Breaker to the OFF position and remove the simultaneous corona assembly.

    1. Visually inspect corona wire and corona screen for signs of arcing and for excessive contamination.

    2. Clean corona wires and corona grid.

b. Replace the High Voltage Supply PCA.

High transfer I fail

This message occurs when the transfer current is measured at 32 counts greater than the expected count. The expected transfer count is equal to (3/2 times the transfer current setting) - 127. Initiate display commands 151 (Transfer Corona Current) and 251 (Transfer Corona Current Setting) to verify the message

Possible causes:

a. Transfer Corona Assembly
b. High Voltage Supply PCA

Recommended procedure:

a. Place printer's Front Power Breaker to the OFF position and remove the transfer corona assembly.

    1. Visually inspect corona wire and corona screen for signs of arcing and for excessive contamination.

    2. Clean the corona wires.

    3. Verify the resistance from the corona connector ball to the "D" shaped washer is approximately 100 K ohms.

b. Replace the High Voltage Supply PCA

Hopper motor warn

This message occurs when the measured current of the toner hopper motor is less than 21 counts.

NOTE

If this error occurs, the printer will continue to print until the printer detects that the density of toner on the developed drum is starting to decrease; at that time the printer would stop printing due to a "High reflectance" error.

Possible causes:

a. Toner Hopper Interlock Switch
b. Triac PCA
c. AC Power PCA
d. Toner Hopper Motor
e. Control PCA

Recommended procedure:

NOTE

Ensure that no other error messages are displayed in conjunction with this message and that the AC Contactor is closed.

a. Verify that the toner hopper interlock switch is closed and operating correctly. The toner hopper switch is located to the right of the developer engage control lever; when the toner hopper is closed, a stopblock at the base of the hopper closes the interlock microswitch.

b. Ensure that the toner hopper cable is installed and that the wires are not shorted or open (see figure 6-2 for hopper motor circuitry).

c. Verify that the ribbon connector from J7 of the AC Power PCA to J2 Slot 17 of the backplane is properly seated and that the wires are not shorted or open.

d. Ensure that the Control PCA is properly seated.

WARNING

Damage may occur if the toner hopper motor is on for more than one minute while the machine is not printing.

e. Measure testpoint TP34 on the AC Power PCA while initiating device on command 724 (Toner Hopper Motor, on continuous).

NOTE

Toner Hopper OFF = High
Toner Hopper ON = Low

If TP34 measures a logic level high (+5 Vdc), the problem can be isolated to either the Control PCA or the AC Power PCA.

If TP34 measures a logic level low (less than 0.4 Vdc), the problem can be isolated to either the AC Power or the Triac PCAs.

Illegal device comb

This message occurs if an illegal combination of Device On/Off commands is attempted. Refer to the HP 2680A Service Manual for the correct listing of Device ON/Off commands.

Illegal DCS command

This message occurs when the Machine Control System receives an undefined Data Control System command.

Possible causes:

a. Data Processor PCA
b. Print Control PCA
c. Machine Control Processor PCA
d. DCS I/O PCA
e. Memory Arrays

Recommended procedure:

a. Ensure that all PCAs and DCS front plane connectors are properly seated.

b. Execute all DCS self test diagnostics (Service Tool Commands 610 through 618), refer to section III of the HP 2680A Service Manual.

c. Execute Service Tool Command 619 (Dump DCS Memory Error Log), replace any memory chips that have been flagged by the memory controller.

d. Verify that the DC power supplies are adjusted properly, refer to the Power Supply Assemblies Adjustment procedure in section IV of the HP 2680A Service Manual.

e. If the problem persists, replace the PCAs in the order listed as possible causes.

Illegal MCS command

The Data Control System has received an undefined Machine Control System command.

Possible causes:

a. Machine Control Processor PCA
b. Print Control PCA
c. DCS I/O PCA
d. Data Processor PCA

Recommended procedure:

a. Follow steps a through d of the recommended troubleshooting procedure for "Illegal DCS command".

b. If the problem persists, replace the PCAs in the order listed.

Illegal NVR #XX

This message occurs when an invalid parameter is being entered in nonvolatile RAM. The XX corresponds to the 2XX level display command which is attempted to be loaded.

Possible causes:

a. The operator attempted to enter an illegal value via a 300 level modify command.
b. NVR failure

Recommended procedure:

a. In the situation where an invalid entry is the cause of the error message, the entry of the valid NVR parameter clears the error message. Refer to the Non-Volatile RAM Initialization Procedure in section IV of the HP 2680A Service Manual. Note, several NVR parameter values can be obtained by examination of a previously successful Self Test diagnostic print-out.

b. If the message persists, replace the Machine Control Processor PCA.

Interrupt fail X

This message occurs at power-on when the Machine Control Processor is unable to reset an interrupt generated during the internal power-on diagnostics.

Recommended procedure:

a. Refer to the following table to determine which PCA may be the possible cause of the error message:

Type of Interrupt	Possible Faulty PCA
0	Machine Control Processor
1	DCS I/O
2	DCS I/O
3	Monitor
4	Machine Control Processor
5	Machine Control Processor
6	Optics
7	AC Power or Control PCAs

b. If the error message persists and the Machine Control Processor PCA has not been replaced, replace it.

Invalid phtr target

This message occurs when the DAC reference level generated on the AC Power PCA is measured below 50 counts. This message is stored in the CE error log; initiate service tool command 651 to display the log.

Possible causes:

a. AC Power PCA
b. Monitor PCA (A/D subsystem channel)
c. Control PCA (Filter network)

Recommended procedure:

a. Reseat the Monitor and Control PCAs and the ribbon connector from J7 of the AC Power PCA to J2 Slot 17 of the backplane.

b. Rotate switch S1 on the AC Power PCA through the six positions listed in the following table, and measure test points TP 1 (DAC) and TP13 (DAC REF). All measurements should be +/- 0.2 volts of the value listed. Use Appendix A to determine the A/D count values.

NOTE

The A/D counts are not determined until the printer attempts to run (either actual data or Self Test).

S1	TP1 DAC	TP13 DAC REF	A/D Counts (+/-10)
0	- 3.09 Vdc	+ 3.09 Vdc	144
1	- 3.37	+ 3.37	157
2	- 3.64	+ 3.64	169
3	- 3.98	+ 3.98	185
4	- 4.27	+ 4.27	198
5	- 4.52	+ 4.52	210

If the measured values are not within +/- 0.2 Vdc range, replace the AC Power PCA.

NOTE

If test point TP 13 measures approximately 0 Vdc, verify that the ribbon connector from the AC Power PCA to J2 Slot 17 of the backplane is not pinched or damaged.

c. Shorted or open filter network on the Control PCA, replace the Control PCA.

d. Failure of the A/D subsystem to correctly measure the DAC signal, replace the Monitor PCA.

Hints

Signal Path - Rotary switch on the AC Power PCA - TP1 (DAC) on the AC Power PCA - TP13 (DAC REF) on the AC Power PCA - J7-30 AC Power PCA - P1-30 Control PCA (filter network) - P2-27 (Control PCA) - P2-8 (Monitor PCA)

Invalid stepper pos

This message is displayed while operating in the Stepper Registration Mode, when the desired stepper position is too close the stepper encoder edge.

Recommended procedure:

a. When this error message is displayed, either a new stepper position must be selected or the encoder disc must be mechanically realigned. Refer to the Input Stepper Registration Alignment procedure in section 4-4 of the HP 2680A Service Manual.

Job active pwr fail

The message indicates that power was lost during a print job. If this message occurs, the operator should investigate to determine if

all jobs were completed. If not, the job(s) should be rerun. This message is cleared by pressing RUN at the operator's panel.

Line overvoltage

This message occurs when the line voltage has exceeded 252 Vac within the printer. Initiate display command 106 ENTER (Line voltage) to verify the message.

Possible causes:

a. Input power improperly strapped
b. AC Power PCA
c. Zero Crossing Transformer
d. Monitor PCA (A/D subsystem failure)

Recommended procedure:

a. Measure the line voltage at the input to the AC Contactor. If the line voltage is consistently above 250 Vac, verify that the printer has been correctly configured. Refer to the Power Configuration in section II of the HP 2680A Service Manual.

b. Verify that all cabling to the AC Power PCA is in good condition (no pushed pins or broken or frayed wires). Specifically verify that J5 (DC power input for the AC Power PCA) and J4 (AC Power PCA Transformer and Zero Crossing Transformer inputs) to the AC Power are seated. For power module explanation, see figure 6-20.

c. Verify the line voltage adjustment, refer to the AC Power PCA Adjustment in section 4-4 of the HP 2680A Service Manual.

NOTE

If test point TP22 "Vline" does not change while adjusting the Line Voltage Adjust potentiometer, replace the AC Power PCA.

d. Verify that test points TP17 and TP18 (reference to ground) on the AC Power PCA measure between 6.00 to 7.50 Vac. If the measured values are not within this range, replace the Zero Crossing Transformer.

e. The A/D subsystem may not be correctly converting the line voltage into a representative digital value; replace the Monitor PCA.

Low line voltage

This message occurs when the line voltage is below 214 Vac within the printer. Initiate display command 106 (Line Voltage) to verify the message.

Possible causes:

a. Input power improperly strapped
b. AC Power PCA
d. AC Power PCA Cabling
e. Zero Crossing Transformer
f. Line Voltage Adjustment (AC Power PCA Adjustment)

Recommended procedure:

Follow the recommended troubleshooting procedure listed for "Line overvoltage".

Low primary I fail
Low primary I warn

These messages occur when the primary current is less than (2/3 X the primary current setting) - 129 or if the primary current is less than 40 counts. Initiate display commands 131 (Primary Corona Current) and 231 (Primary Corona Setting) to verify the message.

Possible causes:

a. Arcing in the Primary Corona Assemby System (corona, cable, connector, Primary Screen PCA, etc ...)

NOTE

An arcing corona may be caused by:
1. The corona assembly not being fully seated to it's connector.
2. Damaged corona assembly (the screen flange may be bent too close to ground of to the grid).
3. The High Voltage Screen PCA may be installed without adequate clearance between the PCA and the cable and ground.

b. Fuse F1 High Voltage Supply PCA
c. High Voltage Supply PCA
d. Monitor PCA
e. Primary Screen PCA
f. Simultaneous Corona System

Recommended procedure:

a. Place Front Power Breaker to the OFF position, open printer front door, and remove the primary corona assembly.

   1. Visually inspect corona assembly for signs of electrical discharge or arcing.

   2. Inspect the corona wires for damage. If damaged or broken, replace.

   3. Inspect the primary corona wires and primary screen for contamination and clean if necessary.

   4. Verify the resistor endblock connector is not damaged as follows:

      (a) Visually inspect connector for any signs of electrical breakdown.

      (b) Verify the resistance from the connector ball to the corona wire "D" washer is approximately 100 K ohms.

b. Verify that fuse F1 on the High Voltage Supply PCA is not open.

c. Inspect the primary corona cable (J2 of the High Voltage Supply PCA to the connector of the EP backpanel) for loose connections and corrosion. Tighten all loose connections and replace any corroded cables.

d. To verify that the corona is not arcing, proceed as follows:

   1. Initiate device on command 731 (Primary Corona) at the Service Control Panel (enter the command press ENTER, and then RUN).

   2. Initiate command 676 (enable high voltage system), and open the printer front door.

   3. Press HALT, to temporarily disable the Primary Corona Device On command. While corona is disabled, remove the drum from the printer.

   4. Press RUN to re-enable the Primary Corona. Visually inspect the Primary Corona, Corona Cable, and connector for arcing.

   5. Press HALT, perform modify command 331 (Primary Corona Setting) and enter a setting of 255, press ENTER, and then press RUN to re-enable the primary corona. A corona setting of 255 counts would be the maximum corona setting (i.e., if the corona is going tc arc, it would probably occur at this maximum setting). Visually inspect the corona area for any signs of arcing. If arcing is detected, remove power from the printer and correct the problem (see Possible Causes).

e. If the message persists after performing procedures a and b, replace the High Voltage Supply PCA and then the Primary Screen PCA.

f. Verify that the Simultaneous Corona System (assembly, cabling and circuitry) is correctly installed and operational.

Hints

If the print quality is acceptable and only the warning message is being displayed, the problem could be a primary current sensor problem; replace the High Voltage Supply PCA.

If several other high voltage related failure messages are being displayed inconjunction with the Low primary I fail/warn message, the problem may be associated with the Monitor PCA. Note: all high voltage inputs are multiplexed on the High Voltage Supply PCA and input to the Monitor PCA via a common line for A/D conversion.

Low primary V fail
Low primary V warn

These messages occur if the primary voltage is measured at less than 128 counts. Initiate display command 132 (Primary Corona Voltage) to verify the message.

Possible causes:

a. Primary Corona Assembly
b. Primary Corona Assembly (Arcing Problems)
c. Fuse F1 on the High Voltage Supply PCA
d. High Voltage Supply PCA
e. Monitor PCA

Recommended procedure:

Follow the recommended troubleshooting procedure listed for the "Low primary I fail/warn" message.

Low reflectance

This message occurs when the average reflectance is less than the target by 100 counts. Initiate display commands 224 (Reflectance target) and 125 (Average Reflectance) to verify the message.

NOTE

This message is the result of the densitometer measuring signal which indicates that too much toner is on the surface of the drum.

NOTE

For additional troubleshooting hints, refer to the "High reflectance" diagnostic troubleshooting error message.

Recommended procedure:

a. Initiate the printer Self Test; verify that the "Clean drum= XXX" under the Development Parameters heading reads between 600 to 765 counts. If the measured count does not fall within the range, recalibrate the Densitometer (refer to section IV of the HP 2680A Service Manual.

b. Press 441 ENTER (disable Reflectance Diagnostics) and then press 1125 ENTER (display Average Reflectance). Allow the printer to run (either printing actual data or Self Test) until the average reflectance is within 60 counts of the reflectance target. Enable the reflectance diagnostics (541 ENTER) and continue normal operation.

c. Check the operation of the toner hopper by initiating device on command 724 (Toner Hopper Motor, continuous). If the toner hopper does not appear to be running refer to the "Hopper motor warn" troubleshooting procedure.

NOTE

To more easily determine if the toner motor is working, initiate command 676 (enable high voltage system) and open the printer front door. Then enable the toner motor (command 724) and observe the gear shaft on the hopper chute to see if it is turning.

d. If the printer's firmware date code is greater than 2414, perform the NVR Initialization procedure, refer to Section IV of the Service Manual.

NOTE

If this error occurs after "high toner demand" print job (graphics) followed by a "low toner demand" print job (minimum text), perform step b.

e. Replenish the developer mixture (refer to section V of the HP 2680A Service Manual).

Low screen V fail
Low screen V warn

These messages occur when the screen voltage is less than (2/3 X the primary corona setting) - 150.

Possible causes:

a. Primary Screen PCA
b. High Voltage Supply PCA
c. Primary Corona Assembly
d. Primary Corona Arcing Problems

NOTE

Verify that all other primary corona error related messages have been corrected before proceeding.

Recommended procedure:

a. Place the Front ON/OFF switch to the OFF, open printer front door, and remove the primary corona assembly.

   1. Visually inspect corona assembly for signs of electrical discharge or arcing.

   2. Inspect corona wire for damage; if damaged or broken replace.

   3. Inspect primary corona wires and primary screen for contamination; clean if necessary.

   4. Verify the resistor endblock connector is not damaged as follows:

      (a) Visually inspect connector for any signs of electrical breakdown.

      (b) Verify the resistance from the connector ball to the corona wire "D" washer is approximately 100 K ohms.

b. Clean the electro-luminescent strip.

c. Verify that no arcing is occurring within the Primary Corona System, see step d in the "Low primary I fail" failure message.

d. If the message still persists, replace the assemblies in the order listed as possible cause.

Hints

If the print is acceptable yet, the warning message persists, a failure in the screen voltage sensor may have occurred. Replace the High Voltage Supply PCA.

Low sim corona fail
Low sim corona warn

These messages occur if the simultaneous current is less than (4/5 X the current setting) - 96.

Possible causes:

a. Simultaneous corona assembly
b. Fuse F3 on High Voltage Power Supply PCA
c. High Voltage Supply PCA
d. Damaged or loose Wiring
e. Simultaneous Transformer
f. Primary Corona System

Recommended procedure:

a. Place Front Power Breaker to the OFF position, open printer front door, and remove the simultaneous corona assembly.

   1. Visually inspect corona assembly for signs of electrical discharge or arcing.

   2. Inspect corona wire for damage; if damaged or broken replace.

   3. Inspect simultaneous corona wire and simultaneous grid for contamination; clean if necessary.

   4. Verify the resistor endblock connector is not damaged as follows:

      (a) Visually inspect connector for any signs of electrical breakdown.

      (b) Verify the resistance from the connector ball to the corona wire "D" washer is approximately 100 K ohms.

b. Verify that fuse F3 on the High Voltage Power Supply PCA is not blown.

c. Verify that all wiring comprising the simultaneous corona circuitry is proper connected and in good condition (no pushed pins or cut or frayed wires); see figure 6-18 for simultaneous corona system circuitry.

d. To determine if the corona wires are vibrating, proceed as follows:

   1. Press 741 ENTER RUN (Simultaneous Corona, On) to turn on the corona assembly.

   2. Press 1141 ENTER (Simultaneous Corona Current) and monitor the corona current.

   If the current count is not stable within a five count range, the corona wire is probably vibrating; clean the wire and/or replace the corona wire if the problem persists.

   If the count reads low (see an example of a previous Self Test printout to obtain an approximate count) try replacing the High Voltage Supply PCA first, and then Simultaneous Transformer.

e. Verify that the Primary Corona System (corona assembly, cabling and circuitry) is correctly installed and operational.

Low transfer I fail

This message occurs when the transfer current is less than (3/2 X the transfer setting) - 159.

Possible causes:

a. Transfer Corona Assembly
b. Fuse F2 on the High Voltage Supply PCA
c. High Voltage Supply PCA

Recommended procedure:

a. Place Front Power Breaker to the OFF position, open the printer front door, and remove the transfer corona assembly.

   1. Visually inspect corona assembly for signs of electrical discharge or arcing.

   2. Inspect corona wire for damage; if damaged or broken replace.

   3. Inspect the transfer corona wires for contamination; clean if necessary.

   4. Verify the resistor endblock connector is in good condition.

      (a) Visually inspect connector for any signs of electrical breakdown.

      (b) Verify the resistance from the connector ball to the corona wire "D" washer is approximately 100 K ohms.

b. Verify that the transfer corona assembly is correctly installed (inserted completely). Verify that the Transfer Corona Assembly power cable (black connector) is connected to the High Voltage Supply PCA and that the cable is not damaged (shorted or open wires).

c. Verify that fuse F2 on the High Voltage Supply PCA is not open.

d. To determine if the High Voltage Supply PCA's current sensor is a possible source of the error message, proceed as follows:

   1. Press 431 ENTER (Disable Corona Diagnostics).

   2. Press 1 ENTER RUN (Self Test) and run several copies of the self test.

   3. Press 531 ENTER (Enable Corona Diagnostics).

   Examine the self test print-out. If the print appears to be transferring correctly (from the drum to the paper) yet, the the error message persists after the corona diagnostics has been enabled, the High Voltage Supply PCA current sensor may be faulty. Replace the High Voltage Supply PCA.

Low transfer V fail

This message occurs when the transfer voltage is less than 100 counts. Initiate display command 152 (Transfer Corona Voltage) to verify the message.

Possible causes:

a. Transfer Corona Assembly
b. Fuse F2 on the High Voltage Supply PCA
c. High Voltage Supply PCA

Recommend procedure:

Follow the recommended troubleshooting procedure listed for "Low transfer I fail".

Hints

If this message occurs in conjunction with a "Low transfer I fail", the problem is usually associated with the High Voltage Supply PCA; replace the High Voltage Supply PCA.

MCS/DCS loop-back

This message occurs when the Data Control System does not return the diagnostic word sent by Machine Control System.

Possible cause:

a. Print Control PCA
b. Machine Control Processor PCA
c. Data Control System I/O PCA
d. Data Processor PCA

Recommended procedure:

a. Verify that all Data Control System and Memory PCAs are seated and that the interconnect ribbon cables between the Memory Controller and Memory Array PCAs are seated and in good condition (no short or open wires).

b. Execute all Data Control System memory diagnostics (service tool commands 610 through 619), from the Service Control Panel (see Section III of the Service Manual).

c. Execute all Data Control System memory diagnostics (service tool commands 610 through 619), from the HP-IB Connector PCA (see Section III of the Service Manual).

   If the diagnostics run successfully from the DCS I/O PCA, but do not from the Control Panel, the error could probably isolated to the backplane (MCP/DCS buses).

d. If all diagnostics run successfully and the error message persists, replace PCAs in the order listed as a possible cause.

Mem controller fail

This message occurs when the memory controller can not log memory errors or when the memory controller can not detect and/or flag memory parity errors.

Possible cause:

a. Memory Array front plane interconnect cables
b. Misadjusted DC Power Supplies
c. Memory Array PCA(s)
d. Memory Controller PCA

Recommended procedure:

a. Execute all Data Control System memory diagnostics (service tool commands 610 through 619), refer to section III of the HP 2680A Service Manual.

b. Verify that the Memory Controller and Memory Array PCAs are seated and that the interconnect ribbon cables between these PCAs are seated and have no shorted or open wires.

c. Verify that the dc power supplies are correctly adjusted, refer to the Power Supply Assemblies Adjustment procedure in section IV of the HP 2680A Service Manual.

d. If the message persists, replace the PCAs in the order listed.

No drum

This message occurs when the printer senses that no drum is installed.

NOTE

The Machine Control System verifies that a drum is installed each time the front door is closed, at power-up, and after a reset.

Possible cause:

a. No drum is installed.
b. Invalid Densitometer measurement
c. Misadjusted Densitometer
d. Very dense layer of toner on the drum's surface directly below the Densitometer (this is often caused by an incorrect sequence of events during the New Drum/Wiper Routine.

Recommended procedure:

a. Verify that the photoconductive drum is installed.

b. Re-adjust the densitometer, refer to the Densitometer PCA Adjustment procedure in section IV of the HP 2680A Service Manual.

c. If the message persists, refer to the recommended troubleshooting procedure listed for the "Densitometer fail 1" error message.

No FOP peak found

This message occurs during execution of the RF Modulator Calibration Routine, when the highest First Order Power (FOP) is measured at less than 50 counts.

NOTE

Ensure that all other error messages displayed in conjunction with the "No FOP Peak found" message are corrected before proceeding.

Recommended procedure:

a. Recalibrate Laser Power, refer to service command 622 in section III of the HP 2680A Service Manual.

b. If the message persists, refer to the recommended troubleshooting procedure listed for the "Beam detect failure" error message.

No response from DCS

This message occurs at power-on or system reset when the Data Control System does not respond to the first command received from the Machine Control System within a specified time interval.

Possible cause:

a. Print Control PCA
b. Data Processor PCA
c. DCS I/O PCA
d. Character Processor PCA
e. Machine Control Processor PCA
f. DCS front plane connectors

Recommended procedure:

a. Verify that the Memory Controller and Memory Array PCAs are seated and that the front plane connectors are seated; ensure that all DCS PCAs are fully seated.

b. Execute all Data Control System memory diagnostics (service tool commands 610 through 619), from the Service Control Panel (see Section III of the Service Manual).

b. Verify that the DC power supplies are adjusted properly, refer to the Power Supply Assemblies Adjustment procedure in section IV of the HP 2680A Service Manual.

c. If the message persists, proceed as follows:

   1. Remove the printer backpanel.

   2. Ground the "Self Test" testpoint on the DCS I/O PCA, and execute each DCS self test diagnostic, refer to paragraph 3-28 of the HP 2680A Service Manual. Repair all faults encountered.

      If the diagnostics run successfully from the I/O PCA, but failed when executed from the Control Panel, the error could be isolated to the backplane (MCP/DCS bus).

   3. If the "No responce from DCS" message persists, replace the PCAs in the order listed as a possible cause.

No top of drum

This message occurs when the drum has not been sensed at its top position.

NOTE

The Top of Drum is sensed as a magnet located on the drum drive gear passes a detector on the EP panel.

Refer to the "Drum not in sync" error message for a possible cause and a recommended troubleshooting procedure.

No Top of Stack

This message occurs when the MCP frimware fails to sense the position of either the Top of Stack microswitch (on the flapper box), the Elevator at Top (elevator at top sensor) or a stack safety switch within a specified time interval.

Possible cause:

a. Elevator Motor Circuitry
b. Elevator Top Sensor
c. Top of Stack Switch (and circuitry)
d. Sensor PCA
e. Control PCA

Recommended procedure:

a. Verify that the elevator motor works in both direction (use device ON/OFF command 793 (elvator up) and command 794 (elevator down).

b. Referring to figure 6-14, measure testpoints TP4 and TP5 on the Sensor PCA while using the elevator device ON/OFF command to move the elevator table to it's bottom most and top most positions.

c. Referring to figure 6-2A, verify the Top of Stack microswitch functions correctly.

NOTE

During normal printer operation, once the printer detects the top of stack position the motion of the stacker table is reversed and the table is lowered one inch.

d. Verify the flapper safety switches (refer to figure 6-2A) and the chainbox safety switches (refer to figure 6-14) function correctly. Under normal operation, when these switches are opened (for less than two seconds) the elevator lowers the stacker table.

Noisy signal gnd

This message occurs when ground is measured at greater than 10 counts. Initiate display command 190 (Signal Ground) to verify the message.

Possible cause:

a. Monitor PCA
b. Control PCA
c. AC Power PCA
d. Optics PCA
e. DC Power PCA
f. Optics PCA

Recommended procedure:

If the error message occurs intermittently it probably is a true error; replace the PCAs in the order listed. If the message is always present it is probably a false message; replace the Monitor PCA.

NVR failure

This message occurs when the checksum value generated during the initial printer power-up diagnostics fails to compare with the value previously calculated and stored in non-volatile RAM.

NOTE

A nickel-cadmium battery is used as the power source for non-volatile RAM. The approximate battery life without power applied to the printer is as follows:

one week at 50 degrees Celsius
six weeks at 25 degrees Celsius

Possible cause:

a. Machine Control Processor PCA

Recommended procedure:

a. Reset the printer by toggling the Front ON/OFF switch; verify if the error returns.

b. Re-initialize non-volatile RAM, refer to the NVR Initialization procedure in section IV of the HP 2680A Service Manual. If the sevice manual is not readily available, use the most recent copy of the diagnostic Self Test printout to input values into the non-volatile RAM.

c. If the message persists, replace the Machine Control Processor PCA.

Out of paper

This message occurs when no paper is sensed at the paper-out sensor. The paper out sensor is located at the bottom of the paper guide tube below the splice table.

Possible cause:

a. No paper
b. Paper not threaded correctly
c. Sensor PCA ribbon connector
d. Defective Paper-Out Sensor

e. Sensor PCA
f. Control PCA

Recommended procedure:

a. Verify that the paper is correctly loaded in the printer (threaded around the paper guide tube), refer Paper Loading in the HP 2680A Operator's Handbook.

b. Clean the paper-out sensor lens; if the sensor lens is scratched, replace the lens.

c. Verify the sensor harness (J1 of the Sensor PCA to J9 of the backplane) is properly seated and in good condition (no short or open wires).

NOTE

This harness is subject to a high failure rate.

d. Verify the paper-out sensor adjustment, refer to the Paper-Out Sensor Adjustment procedure in section VI of the HP 2680A Service Manual.

e. If the message persists, replace the items in the order listed as possible cause.

Output door is open

This message occurs when the printer senses that the paper output door (PAMM door) is open.

Possible cause:

a. PAMM interlock switch and wiring
b. Control PCA

Recommended procedure:

a. Verify that the PAMM door is securely closed.

b. Verify the operation of the PAMM interlock switch as follows:

   1. Measure "PAMM INTLK" on the Backplane (Control PCA) while opening the PAMM door.

   2. Note the TTL logic levels: High = door closed
      Low = door open

c. Verify the wiring to the switch is in good condition (no open or short wires).

d. After performing steps a through c and the message still persists, replace the Control PCA.

Output paper misfold

This message occurs when the short focus reflective sensor, in the stacker, detects the presence of paper in the top of the stacker beyond a specified time interval.

Possible causes:

a. Misfold Sensor failed or out of adjustment
b. Sensor PCA
c. Control PCA
d. Elevator Assembly Malfunction
e. Chainbox Assembly Malfunction

f. Flapper Assembly Malfunction
g. Elevator not properly lubricated

NOTE

A majority of paper path problems are the result of poorly manufactured or stored paper. Verify that your paper meets the all requirements as stated in the Paper Specification Guide.

Recommended procedure:

a. Verify that nothing in the stacker is wedged in front of the misfold sensor.

b. Verify the misfold sensor connector is properly seated and that the wiring is in good condition (no shorts or open).

NOTE

Due to the different reflectance qualities in different types of paper, misfold sensor adjustment may be required when paper lots are changed.

c. Verify the paper sensor adjustment, refer to the Misfold Detector Adjustment procedure in section IV of the HP 2680A Service Manual.

d. Verify the operation of the misfold sensor circuitry (see figure 6-14).

e. The "Output paper misfold" message may be a result of a malfunction in the printers paper stacking system. The following checks should be performed if the error message persists:

1. Verify that the Stacker Width Adjustment is correct; the adjustment located on the paper output door (see the Paper Loading section in chapter III of the Operator's Handbook).

2. Verify that the Paper Length Adjustment is correct; the length adjustment is below the printer's Paper Control Panel (see section II of the Operator's Handbook).

NOTE

It may be of value to review the Paper Path Problem Checklist in section V of the Operator's Handbook.

3. Initiate device on command 795 (Flapper Motor) and verify that the flapper assembly is operating. If not, verify the operation of the control circuitry (see figure 6-2).

4. Initiate device on command 778 (Fuser/PAMM Fan and Chain Motor) and verify the chainbox assembly is operating. If not investigate the operation of the control circuitry (see figure 6-2).

5. Verify the operation of the Elevator Motor as follows:

(a) Place the printer in Stack Manual Mode (press the stack manual key on the Paper Control Panel).

(b) Press the Stack Up key and verify that the stacker table moves upward its full travel (to the elevator top switch on the back of the printer).

(c) Press the Stack Down key and verify that the stacker table moves downward to the extent of its travel (to the elevator at bottom switch).

6. Verify that the elevator is leadscrew is clean and properly lubricated (see paragraph 5-8 of the Service Manual).

Overall illum warn

This message occurs when the current of the overall illumination assembly is measured at less than 33 counts. Initiate display command 184 (Overall Exposure Lamp Current) to verify the message.

Possible causes:

a. Illumination lamp(s) failure
b. AC Power PCA
c. Triac PCA
d. Control PCA

Recommended procedure:

NOTE

Ensure that the AC Contactor is closed before proceeding. If not refer to "AC Contactor Malfunctions" in section 2-2 of this manual.

a. Verify the lamp operation as follows:

1. Press 676 ENTER (High Voltage System Enable) on the Service Control Panel and open the printer front door.

2. Press 745 ENTER RUN (Overall Illumination, Enable) and observe whether the ten incandescent lamps are illuminated. Replace all ten lamps.

NOTE

If none of the lamps illuminate, interchange the erase lamp and overall illumination lamp assemblies. If the assembly is defective the "Erase lamp warn" message will appear; replace all the lamps in the defective assembly.

b. Verify that the ribbon connector from J7 of the AC Power PCA to J2 Slot 17 of the backplane is seated and in good condition (no short or open wires).

c. Verify that the wiring from J6 of the AC Power PCA to the Overall Illumination Assembly is properly installed and in good condition (no short or open wires).

d. Verify the overall illumination control line as follows:

1. Measure testpoint TP36 on the AC Power PCA while executing device on command 745 (Overall Illumination, Enable).

If TP36 measures a logic low (less than 0.4 Vdc), replace the AC Power PCA.

If TP36 measures a logic high (+ 5.0 Vdc), replace either the Control or AC Power PCA.

Pad/area fail XX

This message occurs when the preheater current is measured at less 32 counts when the pad/area is presumed to be ON. The "XX" refers to the preheater pad and the associated section of the pad respectively (see table listed in recommended procedure).

Possible cause:

a. Preheater Assembly
b. AC Power PCA

Recommended procedure:

a. Verify that J3 on the AC Power PCA is properly seated and the that the wires are not shorted or open. Inspect the harness for defective crimps and defective (loose) harness connectors.

b. Measure the resistance (see the following table) between the testpoints on the Triac PCA and connector P3 to the AC Power PCA. Replace the preheater assembly if any shorted or open are discovered.

ERROR	PAD	SECTION	J3 AC POWER PCA	TRIAC PCA	RESISTANCE in ohms +/- 20%
11	1	1	P3-1	TP3	330
12	1	2	P6-6	TP3	330
13	1	3	P3-15	TP3	330
14	1	4	P3-10	TP3	320
21	2	1	P3-2	TP4	340
22	2	2	P3-9	TP4	340
23	2	3	P3-14	TP4	340
24	2	4	P3-7	TP4	330
31	3	1	P3-3	TP5	580
32	3	2	P3-12	TP5	580
33	3	3	P3-13	TP5	580
34	3	4	P3-14	TP5	580

c. If after performing steps a and b, and the error message persists, replace the AC Power PCA.

Paper jam

This message occurs when the printer senses that the paper is not moving at an uniform rate of speed (either too fast or too slow).

Possible cause:

a. Paper System Cabling
b. DC Power PCA
c. Control PCA
d. Sensor PCA
e. Tension Motor

Recommended procedure:

In troubleshooting a paper jam, judgement must be exercised to determine the source of the paper jam. The jam could result from any malfunction along the length of the paper path. The following is a list of areas and items to be checked in event of a paper jam.

Paper a. Verify that the paper used meets the HP 2680A's recommended paper standards. Refer to the Paper Specification Guide P/N 02682-90913. Inspect the paper for tractor feed hole deformation and for multiple pages being glued together. Observe paper as it enters the printer;

try to determine if the tractor strip perforations are excessively weak or torn.

Input Tractors

a. Verify that the input tractors are correctly adjusted.

NOTE

When adjusting the tractors to the paper width, adjust so that the paper web is firm in the center (showing minimal sag) but not so firm to cause tractor hole deformation.

b. Verify input stepper motor operation.

NOTE

The input stepper motor controls the operation of the input tractors. Stepper motor control is initiated on the Control PCA. ROMs on the Control PCA are addressed and provide drive signals which are input to the DC Power PCA. Stepper motor drive current is input to the stepper drive motor via the J5 connector on the DC Power PCA.

Preheater

a. Verifiy the preheater is correctly aligned and not hindering the paper's movement.

b. Verify that the preheater is clean.

c. Excessive preheater vacuum may result in a paper jam. Verify that the preheater vacuum in not too excessive as follows:

1. Initiate device on command 701 (Vacuum On) and then try to move the paper on the preheater. The paper should be held firmly but not so firm that the paper can not be moved.

2. Verify that the orifice valve is installed in the preheater filter canister (refer to reference 9 in figure 7-8 of the 2680A Service Manual). If the valve is missing, too much vacuum is applied to the preheater thereby causing a possible paper jam.

Output Tractors

a. Verify that the output tractors are correctly adjusted. Adjustment of the output tractors must be performed with fused paper.

b. Verify that the pulley on the output tractor drive shaft is not slipping on the drive shaft and that the set screw is securely tightened.

c. Verify that nothing is hindering the paper's movement in the output tractor area.

NOTE

If the PAMM door is suspected of being the cause of the paper jam, try opening the door and advancing the paper with the PAPER FORWARD key. If the paper only jams with the door closed, a misadjusted door may be the cause of the paper jam.

d. Inspect the output tractor doors for toner build-up; clean the doors if necessary.

e. Verify that the output tension is correctly set as follows:

1. Initiate display commands 270,272 and 273 (Start, Run and Stop Tension Settings).

2. Compare the values displayed with those of a previous successful Self Test; re-adjust tensions if necessary.

f. Verify that the output tractors are turning as follows:

1. Remove the printers rear panel.

2. Press PAPER FORWARD while observing the output tension drive pulley and drive belt; note movement.

g. Inspect the output tension drive pulley for wear.

h. Inspect the output tension drive belt for adjustment and for wear.

NOTE

Output tension drive is initiated on the Control PCA. Tension current from the Control PCA is input to the DC Power PCA where the final signal are generated and output to the tension motor.

i. Verify that all connectors to the DC Power PCA, Control PCA, Sensor PCA and Tension Motor are seated and in good condition (not shorted or opened).

Exit Guide Chute

a. Verify that the paper movement is not hindered as it exits the PAMM module.

HINTS

Consult the Paper Path Problem Checklist in section V of the HP 2680A Operator's Handbook.

Often various types of paper react differently. If no readily identifiable cause can be found for excessive paper jams, it is advisable to try a different type of paper.

Paper width sensor

This message occurs when the paper width is measured at less than 45 counts and greater than 245 counts.

Possible cause:

a. Damaged or defective Paper Width Sensor
b. Misadjusted Paper Width Sensor
c. Monitor PCA
d. Damaged cabling

Recommended checks:

a. Examine the paper width sensor potentiometer assembly and verify the following:

1. Verify the tractor follower spring is wound on the hub of the potentiometer.

2. Verify that the spring is not kinked.

3. Verify that the sensor spring is connected to the tractor follower.

4. Verify that the tractor follower movement is not hindered and that the follower slides easily along the guide shaft.

NOTE

To observe the paper width sensor initiate display command 1175 (Paper Width) while moving the tractor follower and verify the display count changes.

b. Recalibrate the paper width sensor, refer to the Paper Width Sensor Adjustment procedure in section IV of the HP 2680A Service Manual.

NOTE

The output from the paper width sensor potentiometer is input to the Monitor PCA. At the Monitor PCA the potentiometer output is converted into a digital count to be used by the Machine Control Processor.

c. Verify that all connectors to the sensor potentiometer are seated and in good condition (no short or open wires); refer figure 6-14.

Preheat fail X

The "Preheat fail 1" message occurs when the preheater does not warm-up and the diagnostics are unable to measure current to isolate the failure.

The "Preheat fail 2" message occurs when the preheater does not warm-up and no current is detected.

The "Preheat fail 3" message occurs when the preheater pads are unable to stabilize within 20 counts of their target temperature while the printer is printing.

Possible cause:

a. Preheater assembly
b. AC Power PCA
c. Control PCA

Recommended procedure:

Follow the recommended troubleshooting procedure listed for "Pad/area fail XX" and "Phtr area0 X" messages.

Phtr area0 X

This message occurs when the current of the individual preheater pad is measured to be acceptable but the pad fails to warm-up. "Phtr area0 4" message is displayed when all current measurements are acceptable and no pads are warming up.

Possible cause:

a. Fuses F1-F3 on the Fuse Bracket
b. Preheater Assembly
c. Fuses F1-F3 on the Triac PCA
d. Triac PCA
e. Triac Q10 (Pad A), Q11 (Pad B), or Q12 (Pad C) on the Triac Bracket

Recommended procedure:

a. Inspect the preheater fuses on the Fuse Bracket and on the Triac PCA and verify that the fuses are not open.

NOTE

Phtr area0 1 = F1 (top fuse)
Phtr area0 2 = F2 (middle fuse)
Phtr area0 3 = F3 (bottom fuse)
Phtr area0 4 = check all fuses

b. Inspect the preheater power connector, the six pin connector, above the AC Power PCA for damaged wires (short or open). Inspect the harness for defective crimps.

c. Verify the preheater pad resistance measurements as follows:

1. Set the rear MAIN POWER breaker to OFF.
2. Measure the resistance between the following points on the six pin connector located above the AC Power PCA.

pin 1 to pin 4 60 ohms +/- 20%
pin 2 to pin 5 60 ohms +/- 20%
pin 3 to pin 6 107 ohms +/- 20%

If any opens are detected, replace the preheater assembly.

d. Inspect all connectors in the preheater control circuitry (see figure 6-6) and verify that all connectors are seated and that all wires are in good condition (no damaged wires or pushed pins).

Phtr I sensor X

This message occurs when the current measured for pad "X" (either pad one, pad two, or pad three) is less than 32 counts but pad "X" warms up.

Possible cause:

a. AC Power PCA
b. Control PCA
c. Monitor PCA

NOTE

Verify that all other error messages are corrected before proceeding.

Recommended procedure:

a. Verify fuse F1 on the AC Power PCA is not open; if open replace.

b. Replace the AC Power PCA.

Hints

If any other ac switched load warning/failure message is displayed in conjunction with the "Phtr I sensor X" error message, replace the AC Power PCA.

Faulty current sensing problems may be associated with the AC Power, Control or Monitor PCAs.

Phtr overtemp X

This message occurs when the preheater pad temperatures are measured above 250 counts or when the hardware "overtemp" bit (TP3 on the AC Power PCA) is set. The "X" refers to either pad 1, pad 2 or pad 3. A "Phtr overtemp 4" indicates that the hardware overtemp (TP 3 on the AC Power PCA) has been set. Initiate display command 1117 (Multiple Preheater Display) to determine which pad(s) were the source of the error message.

Possible cause:

a. AC Power PCA
b. Triac PCA
c. Monitor PCA (faulty A/D subsystem)
d. Triac Q10 (Pad A), Q11 (Pad B), or Q12 (Pad C) on Triac Bracket
e. Preheater Thermocouples
f. Preheater Assembly

Recommended procedure:

a. Identify the faulty pad(s) as follows:

   1. Initiate display command 1117 (Multiple Preheater Display) and monitor the preheater temperatures. The warmest pad is usually the source of the error message and may be used to isolate the defective circuitry.

      AXXXX BXXXX CXXXX TXXXX

      A = Pad #1
      B = Pad #2
      C = Pad #3
      T = Preheater Target Temperature

   2. Note which pad(s) are exceeding the error message limit.

      NOTE

      If the preheater has been off for some time, the temperatures displayed will be lower than at the time of the failure.

   3. If any of the pad temperatures increase beyond the specified limit, when the printer is static (not printing), power down the printer and unplug the appropriate connector on the Triac PCA (J6-Pad A, J7-Pad B, or J8-Pad C); refer to figures 6-6A and 6-6B for preheater system circuitry. Power on the machine, if the problem persists, replace the appropriate triac. If the problem goes away, replace the AC Power PCA.

b. If the error occurs when the preheater is turned on (Device On 770) and the temperature increases beyond the 250 limit, the regulation circuitry may not be controlling the temperature; replace the AC Power PCA.

c. If the error occurs shortly after power has been applied to the printer, the source of the error maybe a faulty thermocouple. Verify the thermocouples as follows:

   1. Measure the continuity of the thermocouple pairs (the thermocouple pairs are connected to J1 of the AC Power PCA, red and yellow wire). Each pair should measure approximately 16 ohms, if any pair appears to be open or shorted; replace the preheater assembly.

      P1-1,2
      P1-3,4
      P1-5,6

d. Verify that the Preheater Assembly's yellow/green ground wire located behind the printer's front output tractor is securely fastened the frame, and that the wire is in good good condition (not frayed or cut).

Phtr temp sensor

A preheater temperature sensor has measured a reading of less than 10 counts while at least one other pad has been measured at an reading of greater than 25 counts.

Possible causes:

a. Faulty thermocouple amplifiers (AC Power PCA)
b. Faulty thermocouple (Preheater Assembly)
c. Ribbon connector J1 on AC Power PCA to the Preheater
d. AC Power PCA
e. Connector J7 on the AC Power PCA to J2 Slot 17 of the Backplane
f. Defective Filter Circuitry (Control PCA)
g. Faulty A/D subsystem (Monitor PCA)

Recommended procedure:

a. Ensure that all connectors are properly seated and that no wires are shorted or open.

b. Ensure that the preheater is properly grounded. Verify that the preheater ground strap above the right output tractor is securely connected.

c. If the message persists, refer to the "Phtr overtemp X" recommended troubleshooting procedure.

Prim cor supply 2

This message occurs when the primary current is measured at greater than 32 counts when the corona is presumed to be OFF.

Possible cause:

a. High Voltage Supply PCA
b. Monitor PCA

NOTE

When this message is displayed, the +28Vdc power supply is disabled.

Hints

Initiate display command 131 (Primary Corona Current), if the count displayed is approximately zero with the 28 Vdc supply off, the High Voltage PCA is probably the source of the error message.

Print lost on left
Print lost on right

This message occurs when the printed data is outside the print image area (see figure 1-1 of the 2680A Operator's Handbook).

NOTE

One-half inch margins are required at the bottom and top of each physical page (adjacent to the page perforation) and a 0.08 inch margin is required between the print image area and the tractor strip perforations.

Recommended procedure:

a. Use the ADJUST PRINT POSITION keys to reposition the printed text inside the print image area.

NOTE

The job should be rerun if any data has been truncated.

b. Verify that the job was correctly formated. It is possible to create a job that exceeds the boundaries of the print image area.

Purge pump, fan fail

This message occurs when the purge pump/fan current is measured at less than 21 counts.

NOTE

This message is eliminated when MCS firmware date code 2414 is installed in the printer.

Possible cause:

a. AC Power PCA
b. Triac PCA
c. Control PCA
d. Purge Pump Assembly
e. Purge fan

Recommended procedure:

NOTE

Ensure that the ac contactor is closed before proceeding. If not refer to the "AC Contactor Malfunctions" in section 2-2 of this manual.

a. Verify that the wiring from the Triac PCA (J3 -11 and 12) to the purge pump is not shorted or open.

b. Verify that the ribbon cable from the AC Power PCA to J1 Slot 17 of the backplane is seated and not shorted or open, and that the Control PCA is seated.

c. Verify the purge fan/pump operation as follows:

1. Press 780 ENTER RUN at the Service Control Panel to enable the purge pump and fan.

2. Visually inspect the purge pump and fan to verify their operation.

If both loads are operational, yet the error message persists, proceed to step e.

If neither load is operational, proceed to step d.

If only one load is operational, verify that the other load is correctly wired. If the wiring appears to be correct and in good condition, replace the defective load.

d. Verify that the purge pump/fan is being enabled as follows:

1. Measure test point TP35 on the AC Power PCA while initiating device on command 780 (Purge Pump/Fan, Enable).

If TP35 measures a logic Low, the problem may be isolated to either the AC Power or the Triac PCAs.

If TP35 measures a logic High the problem may be isolated to either the Control or AC Power PCA.

e. Possible failure of the current sensing circuitry; the problem may be associated with the Monitor, Control or AC Power PCAs.

RAM failure XXXX

This message occurs at initial machine power-up, when the MCP power-up diagnostics detect a faulty RAM location. The "XXXX" refers to the failing address location.

Recommended procedure:

a. Reseat the Machine Control Processor PCA.

b. Perform a hard reset on the printer (toggle the Front Power breaker OFF/ON) and verifiy if the message returns.

If a failing address is consistently displayed, replace the faulty RAM, refer to section 3-30 of the HP 2680A Service Manual to determine the faulty chip location.

NOTE

Two versions of the MCP PCA are installed in existing printers, the older PCA's required eight ROM, and 16 RAM chips while the newer MCP PCA's only requires eight ROM and four RAM chips. Ensure the correct table is entered when referencing the address/chip failure.

If random failure addresses are displayed, replace the Machine Control Processor PCA.

Ready for Data

Refer to the "Waiting for data" error message.

Relay failure X

This message occurs when the preheater diagnostic detects current when all preheater current is presumed to be OFF. The "X" refers to the following messages:

1 - Current less than 32 counts was detected in relay 1
2 - Current less than 32 counts was detected in relay 2
3 - Current less than 32 counts was detected in relay 3
4 - Current less than 32 counts was detected in relay 4
5 - Current less than 32 counts was detected in all relays.
6 - Current detected with all relays open.

Possible cause:

a. Fuse F1 on the AC Power PCA
b. AC Power PCA
c. Control PCA
d. Monitor PCA (A/D subsystem)

Recommended procedure:

a. Verify that fuse F1 on the AC Power PCA is not open.

NOTE

LEDs DS2 through DS5 on the AC Power PCA are illuminated when the preheater relays K1 through K4 are being energized.

b. Defective relay on the AC Power PCA, replace the AC Power PCA (refer to preheater circuitry on figure 6-6A and 6-6B).

NOTE

During the preheater diagnostics, all relays should be open and then close one at a time. Then only the appropriate relays should close as determined by the paper width.

c. Current sense peak detector failure, replace the Control PCA.

d. Analog/Digital subsystem failure, replace the Monitor PCA.

Relay warning

This message occurs during the preheater diagnostic, when current is detected when all relays are presumed to be open.

Refer to the "Relay failure X" message for a possible cause and a recommended troubleshooting procedure.

RF driver failure
RF driver warning

These messages occur when the difference between RF driver output with the driver on and with the driver off is less than .25 times the beam setting. Initiate display command 162 (RF Power Instantaneous) and 261 (RF Modulator Power Setting) to verify the message.

Possible cause:

a. Optics PCA
b. RF Amplifier
c. Control PCA (D/A Converter, Modulated Power-In)
d. Monitor PCA
e. Damaged Optics Cable (Optics Casting)

Recommended procedure:

a. Initiate display command 116 (Multiple Optics Display). Verify that the First Order Power, beam on ("FXXX") is between 90 to 95 counts. If the First Order Power, beam on is not in this range, execute service tool command 623 (Measure Optics Parameters, see section 3-42 of the HP 2680A Service Manual) and adjust the beam setting until FOP is in this range. Some trial and error may be required to complete this adjustment.

   If both FOP and RF Power remain low after the adjustment, the source of the error may be with either :

   Optics PCA
   RF Amplifier
   Control PCA

   If FOP can be adjusted to within the 90 to 95 count range and RF Power remains low, the source of the error may be with either the :

   Optics PCA
   Monitor PCA

RF driver stuck on

This message occurs when the RF Modulator Power is measured at greater than 16 counts when the RF driver should be Off.

Possible cause:

a. Optics PCA
b. Print Control PCA
c. Optics Cable (J6 of the backplane to Optics PCA)

Recommended procedure:

a. Ground test point TP4 on the Optics PCA, if the message persists replace the Optics PCA.

ROM failure XXXX
*ROM failure XXXX

The "ROM failure XXXX" message occurs at initial printer power-up when the MCP diagnostics detect a checksum error in Read Only Memory. The "*ROM failure XXXX" message occurs at initial printer power-up when the MCP diagnostics detect that a particular ROM memory chip is installed at the wrong address.

Recommended procedure:

a. Reseat the Machine Control Processor PCA.

b. Reset the printer by toggling the Front ON/OFF switch; verify if the message persists.

   If the failing address is consistently displayed, replace the faulty ROM and/or ensure that the correct ROM is installed into the correct location, refer to section 3-30 of the HP 2680A Service Manual for determining faulty ROM location. See Service Manual for ROM correlation chart.

   NOTE

   Two versions of the MCP PCA are installed in existing printers, the older PCA's required eight ROM, and 16 RAM chips while the newer MCP PCA's only requires eight ROM and four RAM chips. Ensure the correct table is entered when referencing the address/chip failure.

   If random ROM failure addresses are displayed, replace the Machine Control Processor PCA.

Scanner failure

This message occurs when the scanner rotation is detected out of tolerance.

NOTE

Scanner rotation is 75 rps +/- 1%. Two Hall Effect sensors in the scanner motor provide positioning information to the MCP PCA via the Control PCA to accurately monitor the scanner rotation. During normal operation a scanner interrupt is issued to the MCP every 16 revolutions.

Possible cause:

a. 28 Vdc Fuse (F4 DC Power PCA)
b. Scanner Motor
c. DC Power PCA
d. Control PCA

Recommended procedure:

a. Verify that the scanner motor ribbon connector is properly seated to the scanner motor assembly and in good condition (no shorted or open wires). The scanner motor is located at the base of the optics casting and can be accessed when the printer's rear panel is removed.

b. Verify that fuse F4 on the DC Power PCA is not open.

c. The failure may have occurred on the either the DC Power PCA, Control PCA, or the Scanner Motor; see figure 6-11.

Scanner start fail

This message occurs when the scanner motor fails to start (an interrupt has NOT be posted to the Machine Control Processor within 40 seconds of starting the scanner motor.

Refer to the "Scanner failure" message for a possible cause and for a recommended troubleshooting procedure.

Simul cor supply 2

This message occurs when the simultaneous corona current is measured at greater than 32 counts when the corona is presumed to be OFF.

NOTE

This message causes the +28 Vdc power supply to be disabled.

Possible Cause:

a. High Voltage Supply PCA
b. Monitor PCA

Stack safety switch

This message occurs when the stacker safety switches are sensed open for more than 2 seconds.

NOTE

This message causes the AC Contactor to de-energize.

Possible cause:

a. Defective safety microswitch
b. Triac PCA
c. AC Power PCA
d. Control PCA

Recommended procedure:

a. Verify that nothing is pressing against the top of the paper stacker i.e., paper, the auxiliary stacker tray, etc.

b. Verify the the stacker lead screw is clean and that the square shaft is proper lubricated (refer to section V of the HP 2680A Service Manual).

c. Four stacker safety switches are located in the flapper box assembly and four switches are located in the chain box assembly (see paragraph 4-43 of the Service Manual), manually verify the operation of the switch using an ohm meter; replace all defective switches.

Switch Open = High (+5 Vdc)
Switch Closed = Low (0 Vdc)

Hints

For signal and pin locations see figure 6-2. Test point TP 42 on the AC Power PCA determines the direction of the elevator:

Up = Low
Down = High

Test point TP 43 of the AC Power PCA determine if the elevator motor is enabled or not:

Enable = Low
Disabled = High

Stacker full (False)

Each time the Top of Stack microswitch is activated, the motion of the stacker table is reversed, and the stacker table is lowered one inch. At this time the Machine Control Processor monitors the "elevator at bottom" bit. If the "elevator at bottom" bit is active, the printer is taken offline and the "Stacker full" message is displayed.

Possible cause:

a. Top of Stack microswitch (Control PCA)
b. Excessive wear on Top of Switch activator finger (on Flapper Motor).
c. Elevator at Bottom Sensor (Hall Effect Sensor)
d. Sensor PCA
e. Triac PCA
f. AC Power PCA

Recommended procedure:

a. Verify that the stacker movement is not hindered or blocked. Ensure that nothing is caught in the flapper and chain box assemblies.

b. Verify the operation of the Top of Stack switch as follows:

1. Measure testpoint "TOS" on the backplane (Control PCA, J2 pin 17, Slot 17) while manually pressing on the Top of Stack switch.

2. Note the logic level: Switch closed = Low
Switch open = High

c. Verify the operation of the elevator at bottom sensor as follows (see figure 4-16):

1. Verify that all wiring to the elevator at bottom sensor (Hall Effect sensor) to the Sensor PCA is in good condition (no short or open wires) and properly connected.

2. Measure testpoint "ELVB" on the Sensor PCA while positioning the stacker at its bottom position via the STACK DOWN key.

Note the logic levels at the Sensor PCA: Elevator at Bottom = + 5.00
Elevator NOT at Bottom = + 0.23

NOTE

Ensure that the Hall Effect sensor is aligned, refer to section IV of the HP 2680A Service Manual.

d. Verify that the Top Of Stack and Stack safety circuitry functions correctly, refer to the "Stack safety switch" message and to figures 6-2a and 6-14.

NOTE

A quick check of the stacker safe circuitry can be performed by pushing up against either the flapper box or the chainbox. Pushing up against these assemblies should cause the elevator to lower to the bottom of its travel.

Hints

If the elevator motor continues to run when the stacker table is at it's bottom position, replace the following PCAs in the order listed:

1. Triac PCA
2. AC Power PCA

In the situation of a faulty Top of Stack microswitch the stacker table will probably be at its bottom position and the table will NOT be full, or the stacker table will stop before reaching its top of stack position.

In event of a Elevator at Bottom sensor failure, the stacker table will not be at the bottom position and the table will be full.

If the "Stacker full" message fails to occur, verify the operation of the Elevator at Bottom sensor.

Step phase error

This message occurs when NO feedback information (stepnum count) is generated and/or received by the MCP when the input stepper motor is advanced.

NOTE

The stepnum count is provided so that the Machine Control Processor can accurately monitor the paper movement. This ensures that the paper movement is coordinated with the photoconductive drum rotation and that Top of Form can always be found.

The step phase is checked at initial printer power-up and during input stepper registration.

Possible cause:

a. Control PCA
b. DC Power PCA
c. Sensor PCA
d. Encoder PCA

Recommended procedure:

a. Re-initialize the input paper steppers, refer to the Input Stepper Registration Alignment procedure in section IV of the HP 2680A Service Manual.

b. Verify that the paper stepper encoder is securely mounted to paper stepper drive motor,

c. Initiate device on command 790 (Stepper Motor, Forward), if the tractors do not move check circuitry shown in figure 6-9.

Stepper init error

This message occurs when the input stepper registration offset value is too close to an encoder edge.

Recommended procedure:

a. Re-initialize the input paper steppers, refer to Input Stepper Registration Alignment in section IV of the Service Manual.

Stopped by operator (False)

Recommended procedure:

a. Initiate service tool command 650 (Display Machine, Offline cause) and refer to the appropriate error message listing.

Toner hopper low
Toner hopper empty

The "Toner hopper low" message is displayed when the toner hopper low microswitch is active (the toner supply is below a specified level) and the measured average reflectance is acceptable.

The "Toner hopper empty" message is displayed when the toner hopper low microswitch is active (the toner supply is below the specified level) the and the measured average reflectance is 20 counts greater than the reflectance target. All printing ceases when the "Toner hopper empty" message is displayed.

Possible causes:

a. Empty Toner Hopper
b. Bridged toner in Hopper
c. Defective Toner Hopper Low Microswitch
d. Control PCA
e. AC Power PCA
f. Triac PCA
g. Toner Hopper

Recommended procedure:

a. If the toner hopper is empty, add toner; refer to "Adding Toner" in section III of the HP 2680A Operator's Handbook. If the toner is bridged in the toner hopper (packed), stir the contents of the toner hopper.

b. Push in the Toner Hopper Low Reset Button, this button is located on the end of the toner hopper dispensing chute above the developer assembly. The resetting of this switch should closes the hopper low switch an action similar to adding toner, and should cause the error message to clear. If the message persists, check the toner hopper low microswitch and its associated circuitry and wiring (see figure 6-13).

NOTE

The hopper motor cover must be removed to gain access to the hopper low microswitch.

c. If the message persists, verify the toner hopper operation as follows:

1. Press 676 ENTER on the Service Control Panel and open the printer front door.

2. Press 725 ENTER RUN (Toner Hopper Motor, two seconds) and verify if the slotted shaft on the bottom left of the toner hopper is rotating.

If the hopper is rotating and the message persists, proceed to step e.

If the hopper is not rotating, proceed to step c.

d. Investigate toner hopper operation as follows (see figure 6-2):

1. Verify that the toner hopper is connected to the "Toner Hopper Conn" on the printer front panel and that all wires are in good condition (not shorted or open).

2. Measure testpoint TP34 while initiating device on command 724 (Toner Hopper Motor, continuous).

If TP34 measures a logic low, the problem may be isolated to either the AC Power PCA, Triac PCA, or the tonner hopper motor.

If TP 34 measures a logic high, the problem may be isolated to either the Control or AC Power PCAs. Toner Hopper Motor.

e. Remove the toner bag and inspect the toner hopper. Verify that the toner is not bridged or that nothing is hindering toner drive shaft rotation. If the toner is bridged, stir toner to remove the bridge.

Top of form error

This message occurs when the input steppers do not stop at the correct Top of Form base position (on an integral one-half inch increment).

Recommended procedure:

a. Verify that nothing is hindering the paper movement as it enters the printer.

b. Reset the printer (0 ENTER) and then use the PAPER FORWARD key to re-establish Top of Form; if the message persists, proceed to step c.

c. Re-initialize the input paper steppers, refer to Input Stepper Registration Alignment in section IV of the HP 2680A Service Manual.

d. Investigate the operation of the input stepper motor. Observe the amount of torque the motor outputs. If the motor does not appear to be outputting enough torque try replacing either the Control or the DC Power PCAs.

e. Ensure that the stepper motor encoder disc is not loose.

Trfr cor supply 2

This message occurs if the transfer corona current is measured at greater than 32 counts when the corona is presumed to be OFF.

NOTE

This message causes the + 28 Vdc power supply to be disabled.

Possible cause:

a. High Voltage Supply PCA
b. Monitor PCA

Triac/fuse X

This message occurs when the measured current in the preheater sections measure less than 32 counts and the pads do NOT warm-up. The "X" refers to pads 1, 2 or 3.

Possible cause:

a. Fuse(s) F1 - F3 on the Triac PCA
   F1 used for Pad 1 (A)
   F2 used for Pad 2 (B)
   F3 used for Pad 3 (C)
b. Fuse F1 on the AC Power PCA
c. Fuse(s) on the Fuse Bracket
d Triacs on the Triac Bracket
   Q10 used for Pad 1 (A)
   Q11 used for Pad 2 (B)
   Q12 used for Pad 3 (C)
e. Triac PCA
f. AC Power PCA
g. Preheater Assembly

Recommended procedure:

a. Verify that all wiring to the preheater assembly is properly connected and in good condition (not shorted or open).

b. Verify fuses F1 through F3 on the Triac PCA and F1 on the AC Power PCA are not open.

c. Verify that fuses F1 through F3 on the preheater fuse bracket are not open.

d. Verify the preheater pad resistance measurements as follows:

1. Set the rear MAIN POWER breaker to OFF.
2. Measure the resistance between the following points on the six pin connector located above the AC Power PCA.

pin 1 to pin 4	60 ohms +/- 20%
pin 2 to pin 5	60 ohms +/- 20%
pin 3 to pin 6	107 ohms +/- 20%

If any opens are detected, replace the preheater assembly.

e. Verify that the Triac Control circuitry is functioning correctly (see figure 6-6).

Unrecoverable fault

This message occurs when the RUN key is depressed after an unrecoverable failure has occured. The following messages result in the displaying of the "Unrecoverable fault" message.

NOTE

The circumstances accompanying the displaying of the "Unrecoverable fault" often result in the disabling of the + 28 Vdc power supply and/or the de-energizing of the AC contactor. Note the following listing to determine which messages result in these actions.

Error Message	Disable +28 Vdc Supply	De-energize AC Contactor
AC triac short	-	X
Encoder edge error	-	-
Encoder res error	-	-
Front door open	X	X
Fuser switch short	-	X
High ZOP, laser off	X	X
Illegal NVR # XX	-	-
Invalid stepper pos	-	-
No drum	X	X
NVR failure	-	-
Phtr temp sensor	-	X
Prim cor supply 2	X	-
Phtr overtemp X	X	X
RF driver stuck on	X	X
Simul cor supply 2	X	-
Stacker safety switch	-	X
Step phase error	-	-
Stepper init error	-	-
Trfr cor supply 2	X	-

Recommended procedure:

a. Press 5 ENTER (Display Additional Fault Information) and refer to the appropriate error message listing for a possible cause and a recommended troubleshooting procedure.

Use custom shield
Use no shield
Use shield #X

These message appear when the paper width has been changed informing the operator that a different corona shield is required.

Recommended procedure:

a. Verify that "false" shield messages are not displayed by initiating display command 1175 (Paper Width, continuous) and comparing the known paper width with the shield type (number).

Message	Paper Width* (inches)	A/D Count
Paper width sensor		0 - 44
Use custom shield	less than 6.375	45 - 50
Use shield #7	6.375 - 6.625	51 - 60
Use custom shield	6.625 - 8.375	61 - 104
Use shield #6	8.375 - 8.625	105 - 113
Use custom shield	8.625 - 9.375	114 - 129
Use shield #5	9.375 - 9.625	130 - 139
Use shield #4	9.750 - 10.100	140 - 150
Use custom shield	10.000 - 10.500	151 - 160
Use shield #3	10.500 - 10.750	161 - 170
Use custom shield	10.750 - 11.625	171 - 189
Use shield #2	11.625 - 11.875	190 - 197
Use shield #1	11.875 - 12.125	198 - 205
Use no shield	12.125 - ---	206 - 245
Paper width sensor	(failure)	

* Includes the two tractor pin feed strips.

b. If the message persists, refer to the recommended troubleshooting procedure and possible causes list for the "Paper width sensor" error message.

Vacuum bag full

This message occurs when the vacuum bag sensor detects a full bag condition continuously for 30 seconds when the vacuum motor is enabled.

NOTE

This message is eliminated when MCP firmware date code 2414 or greater is installed in the printer.

Possible cause:

a. Vacuum bag is full
b. Toner disposal bottle is full
c. Vacuum pressure switch
d. Control PCA

Recommended procedure:

a. Refer to the CE Maintenance Log Book and note the last time the vacuum bag was replaced. Replace the vacuum bag if the suggested PM interval for bag replacement has elasped. Refer to section IV of the Operator's Handbook for bag replacement.

b. Verify that the Toner Disposal Bottle has not overfilled; replace if overfilled. Refer to Toner Disposal Bottle replacement in section IV of the Operator's Handbook.

c. If both the vacuum bag and the toner disposal bottle are empty and the message persists, investigate the operation of the vacuum pressure switch (bag full sensor) and the Control PCA (see figure 6-13).

NOTE

If the vacuum bag and toner disposal bottle fill up quickly, investigate the possibility of a electrophotograhic process problem i.e., transfer corona, developer assembly, cleaner station, etc... .

Vacuum System Fail

This message is displayed when the vacuum microswitch indicates that printer vacuum is less than the specified level (less than 10 inches of water). This message shuts the printer dowm.

Possible cause:

a. Vacuum Motor
b. Vacuum Belt
c. Vacuum Piping (hoses)
d. Vacuum Valve
e. Vacuum Disposal Bottle
f. Preheater Filter
g. Vacuum Bag
h. Cleaner Station
i. Vacuum Door Seal

Recommended procedure:

a. Refer to the CE Maintenance Log Book and note the last time the vacuum bag was replaced. Replace the vacuum bag if the suggested PM interval for bag replacement has elasped. Refer to section IV of the Operator's Handbook for bag replacement.

b. Verify that the Toner Disposal Bottle has not overfilled; replace if overfilled. Refer to Toner Disposal Bottle replacement in section IV of the Operator's Handbook.

c. If both the vacuum bag and the toner disposal bottle are empty and the message persists, investigate the operation of the vacuum pressure switch (bag full sensor) and the Control PCA (see figure 6-13).

NOTE

If the vacuum bag and toner disposal bottle fill up quickly, investigate the possibility of a electrophotograhic process problem i.e., transfer corona, developer assembly, cleaner station, etc... .

d. Refer to "Vacuum System Malfunctions" in Section 2-2 of this manual.

VDP Controller Error

The density controller monitors print density and compares the measured print density against the target density. This comparison is used to determine how long the toner hopper is to be turned on. The VDP controller diagnostic exercises this routine and displays an error if the diagnostic fails. This is usually a recoverable error and may be cleared by pressing the RUN key. Reoccurance of this error indicates a hardware malfunction.

Possible cause:

a. Machine Control Processor PCA

Recommended procedure:

a. Perform the NVR Initialization Procedure, refer to Section IV of the 2680A Service Manual.

b. If the message persists, replace the Machine Control PCA.

Volume sensor warn

This message occurs when the instantaneous developer volume count is measured at less than 40 counts. Developer volume measurements are taken by the Developer Volume Sensor (DVS). Initiate display command 1135 (Instantaneous Developer Volume) to verify the message.

NOTE

A empty developer assembly measures approximately 70 counts, a normal developer volume count varies from approximately 100 to 150 counts.

Possible causes:

a. Developer Volume Sensor (Developer Assembly)
b. Monitor PCA

Recommended procedure:

a. Ensure the developer cable is properly seated and in good condition (no shorted or open wires).

b. Ensure the developer assembly has been properly replenished with known, good developer mixture package.

c. If the problem persists after performing steps a and b, replace the assemblies in the order listed as a possible cause.

Waiting for data (false)

or

Ready for data (false) after MCP Date Code 2414

A false error message could occur if a communications problem exists between the Machine Control System (MCS) and the Data Control System (DCS), and the DCS and the host system.

NOTE

A temporary "Waiting for data" message often occurs when a large volume of date is downloaded from the host system between print jobs.

Recommended procedure:

a. Execute all DCS Self Test diagnostics (service tool command 610 through 618). Refer to section III in the HP 2680A Service Manual.

b. Refer to the possible causes and recommended troubleshooting procedures listed for the "Beam detect fail" error message.

c. If the message persists, replace the Machine Control Processor PCA.

d. Replace the Print Control PCA or the DCS I/O PCA.

Warming up (False)

Under normal circumstances, when the PRINT key is pressed or when a print command is received from the host system, the printer displays the "Warming up" message. This message is displayed for approximately 40 seconds and then cleared when all of the printer start-up conditions have been satisfied. A false "Warming up" message (where the message is never cleared) indicates that something is faulty in the printer.

Possible cause:

a. Elevator motor failure
b. Defective Top Of Stack switch
c. Defective Stacker Safety switch
d. Triac PCA
e. AC Power PCA

Recommended procedure:

NOTE

Under normal circumstances if the Scanner circuitry were faulty the "Scanner failure" message would be displayed.

a. Press STACK MANUAL on the paper control panel to put the printer in the stack manual mode. Press STACK UP and verify that the stacker moves up to the extent of its travel. Press STACK DOWN and verify the stacker moves down to the extent of its travel. If the stacker is not operational refer to the recommended troubleshooting procedure for the "Stacker full" message and to figures 6-2 and 6-14.

NOTE

If the "Warming up" message is cleared when the STACK MANUAL key is pressed, the printer probably still faulty. Verify that the printers Top of Stack and Stacker Safety Circuitry operates correctly. The printer must be able to operate in the automatic stacking mode.

Wiper blade is up

This message occurs when the wiper blade is NOT sensed in it's operating position (down).

NOTE

The wiper blade interlock switch is located behind the bracket which locks the cleaner station handle in position. The Machine Control Processor checks to see if the wiper blade is down each time the RUN key is pressed.

Possible cause:

a. The wiper blade is not down.
b. Defective interlock switch.
c. Control PCA

Recommended procedure:

a. Ensure that the cleaner station handle is down, and locked in the correct position (the knurled knob should be pushed in until the metal tab, behind the locking bracket, is depressed.

b. Verify that the wiper blade interlock switch connector is properly seated and that all wiring is in good position (no shorted or opened wires).

c. Using an ohmmeter, verify the operation of the wiper blade interlock switch (see figure 6-13).

d. Replace the Control PCA.

+28V supply failure

The +28 Vdc supply has been measured at less than 26 volts (149 counts) . Initiate display command 194 (+28V Supply Voltage) to verify the error message.

Possible cause:

a. +28 Vdc Loads (Transfer Corona, Simultaneous Corona Primary Corona, ESM Supply, Developer Bias Supply, Drum Drive Motor, Scanner Motor, RF Modulator)
b. High Voltage Supply PCA
c. DC Power PCA
d. +28 Vdc Power Supply
e. Power Distribution PCA
f. Control PCA
g. Machine Control Processor PCA

NOTE

Note all error messages which have occured which may be related to the +28 Vdc power supply.

The opening of the printer front door disables the +28 Vdc power supply, ensure that the front door is closed before proceeding.

Recommended procedure:

a. Toggle the Front ON/OFF switch to OFF, wait 20 seconds, and set the switch to ON. If the error message persists, proceed to step b. If the supply is enabled (no error message) begin executing the following steps to determine which load may have caused the failure.

   1. Initiate device on command 701 and 702 (Vacuum and Drum, enable) and verify their operation. If the error message reappear, investigate all circuitry associated with the drum drive circuitry.

   2. Remove the corona assemblies and inspect the assembly for signs of arcing; correct if arcing is detected.

   3. Initiate the following commands and if they cause the +28 Vdc power supply to be disabled.

      731 (Primary Corona, enable)
      741 (Simultaneous Corona, enable)
      751 (Transfer Corona, enable)
      736 (Developer Bias, enable)

      If the execution of any of these commands cause the error message to reappear, investigate the operation of the individual assembly and it's associated circuitry (corona cabling and High Voltage Supply PCA).

   4. Initiate device on command 760 (Scanner, enable). If the execution of this command causes the error message to appear, replace the DC Power PCA.

   5. Initiate service tool command 623 (Measure Optics Parameters). If the execution of this command causes the error message to reappear, replace the RF Amplifier.

b. Verify that the +28 Vdc Power Supply is being enabled. The +28 Vdc Power Supply is enabled by the Machine Control Processor PCA, Control PCA and Power Distribution PCA (see figure 6-22).

c. Disconnect all output voltage lines on the power supply, then measure the power supply's output. If the output measures less than +28 Vdc or if ac voltage is present at the output, replace the power supply.

A/D CONVERSION TABLE

Count	Volts	Count	Volts	Count	Volts	Count	Volts
0	0.00	64	1.25	128	2.51	192	3.76
4	0.08	68	1.33	132	2.59	196	3.84
8	0.16	72	1.41	136	2.67	200	3.92
12	0.24	76	1.49	140	2.75	204	4.00
16	0.31	80	1.57	144	2.82	208	4.08
20	0.39	84	1.65	148	2.90	212	4.16
24	0.47	88	1.73	152	2.98	216	4.24
28	0.55	92	1.80	156	3.06	220	4.31
32	0.63	96	1.88	160	3.14	224	4.39
36	0.71	100	1.96	164	3.22	228	4.47
40	0.78	104	2.04	168	3.29	232	4.55
44	0.86	108	2.12	172	3.37	236	4.63
48	0.94	112	2.20	176	3.45	240	4.71
52	1.02	116	2.27	180	3.53	244	4.78
56	1.10	120	2.35	184	3.61	248	4.86
60	1.18	124	2.43	188	3.69	252	4.94

2-2. Miscellaneous Error Conditions

AC Contactor malfunctions

The AC Contactor must operate correctly to ensure protection of several printer subassemblies. If the contactor clatters, or if the contactor does not energize or de-energize, a problem exists.

NOTE

AC Contactor operation can be verified by opening the printer front door. Assuming no "Unrecoverable fault" condition exists and that the power breakers are ON, opening the front door de-energizes the contactor and closing the door energizes the contactor.

Possible cause:

a. Control PCA
b. AC Power PCA
c. Triac PCA
d. AC Contactor Assembly
e. AC Power PCA Transformer (24 Volts)
f. Machine Control Processor PCA

Recommended procedure:

a. Verify that the Control PCA, AC Power PCA, and the Triac PCA are seated and that the wires to the AC Contactor are not shorted or open.

b. Refer to figure 6-5, measure testpoint TP33 on the AC Power PCA while opening and closing the front door:

   Contactor closed = Low
   Contactor open = High

c. Ensure that the AC Power PCA Transformer connector is installed on J4 of the AC Power PCA. The transformer provides 24 Volts for the contactor relay.

Display Blank (Keyboard Malfunctions)

The non-operational printer is defined as a printer which does not post a display (the display is blank) or where the keyboard does not respond to the commands of the user.

Possible causes:

a. Power Supply Problems
b. Display PCA
c. Display Ribbon Cable
d. Machine Control Proccessor (MCP) PCA
e. Print Control PCA
f. Monitor PCA
g. Control PCA

The following assumptions should be made prior to investigating the cause of a non-functional printer problem:

~ The printer rear MAIN POWER breaker is ON.

~ The printer Front ON/OFF switch is ON.

~ All printer PCAs are installed and all connectors are properly connected.

NOTE

Refer to the General Troubleshooting Table in Section 1-2 of this manual.

Recommended procedure:

a. Verify that AC power is present at the printer. The presence of AC power is easily identified by noting the operation of the cardcage fans. The fans should operate when the rear MAIN POWER breaker is ON.

b. Verify that DC power (+12 -12 and +5 Vdc) is present. The presence of these voltage may be easily identified by observing LED indicators on the Power Distribution PCA. If these LEDs are not illuminated it may be necessary to isolate the power supply, refer to the "Hints" section of this message.

c. Verify that 50 pin ribbon cable from J2 Slot 12 of the backplane to the Display PCA is properly seated and in good condition (no cut or damaged wires).

d. The only cardcage PCAs required to illuminate the printer display are the Print Control and the MCP PCAs. For complete control over the display (i.e., entering CE access mode or displaying parameters) the MCP, Print Control, and Monitor PCAs are required. To isolate a display problem, remove all cardcage PCAs except the MCP and the Print Control PCAs. If the display does not illuminate , the display problem may be isolated to one of the following PCAs:

1. Machine Control Processor PCA
2. Print Control PCA
3. Display PCA

If the printer display illuminates, install the Monitor PCA and verify if keyboard commands may be performed.

Hints

DC Power Supply (+/- 12 and + 5 Vdc)

Check testpoints TP 7, TP 8, TP 9, and TP 10 (overvoltage and undervoltage testpoints); if any of these testpoints are High an error condition exists. Verify the dc voltage level adjustments from the respective power supplies. An overvoltage/undervoltage error can be overridden by grounding testpoint TP 11 (you must perform a hard reset on the printer, power the printer OFF then ON, after you override this circuitry.

To isolate +/- 12 and +5 Vdc Power Supply problems, the supply may be unloaded by disconnecting J5 of the AC Power PCA and J4 of the DC Power PCA, and removing all PCAs from the cardcage except the MCP and Print Control PCAs.

DC Power Supply (+28 Vdc)

The +28 Vdc Power Supply is under the control of the MCP, refer to the "+28V supply failure" message for troubleshooting +28 Vdc problems.

AC Contactor

The AC Contactor is under the control of the MCP and is energized after the Front ON/OFF switch is ON (refer to figure 6-5 for contactor control circuitry).

Electrostatic Monitor Malfunctions

The Electostatic Monitor (ESM) functions as a non-contact, self-calibrating voltmeter and is used to measure the voltages on the surface of the photoconductive drum. The measurements taken by the ESM are applied to an algorithm which inturn controls the currents supplied to the corona assemblies. A defective ESM (inacurrate voltage measurements) results into the wrong current levels being supplied to the corona assemblies. Print quality problems (i.e., excessive carryout, background, streaking) may be the result of a defective ESM. To determine if the ESM is functioning correctly, proceed as follows:

NOTE

Prior to performing any of these procedures, closely inspect the ESM Assembly for damage. Verify that the assembly is seated, that the coupling and solenoid shaft is in good condiition. Verify that the connectors are in good condition (no bent or broken wires).

a. Initiate the printer Self Test (1 ENTER RUN); initiate continuous display command 1119 (Multiple ESM Display). Compare the parameters displayed with those from a previously know good Self Test printout (see Sensor and Development Parameters).

NOTE

119 Multiple ESM Display (EXXXX BXXXX DXXXX CXXXX)
wherein
E = ESM Reference Measurement
B = Door Bias Measurement
D = Developer Voltage
C = ESM Control Voltage

If the parameters vary significantly, investigate the operation of the ESM circuitry (see figure 6-16). Verify that the ESM assembly is clean and that no pins or connectors damaged (see ESM maintenance in paragraph 5-19 of the Service Manual).

b. If the print quality is acceptable (background and/or carryout), the following procedure may be used to isolate the problem:

1. Initiate the printer Self Test (1 ENTER RUN).
2. Disable the printer electrostatic diagnostic loop (430 ENTER).
3. Alternately monitor the Multiple Corona Diagnostics (1115) and the Multiple Drum Potentials (1113); the diagnostics display commands are defined as follows:

Multiple Corona Diagnostic 115 (PXXXX VXXXX SXXXX TXXXX)
wherein
P = Primary Corona Voltage
V = Primary Screen Voltage
S = Simultaneous Corona Current
T = Transfer Corona Current

Multiple Drum Potentials 113 (DXXXX LXXXX PXXXX SXXXX)
wherein
D = Dark Potential of Drum
L = Light Potential on the Drum
P = Primary Corona Setting
S = Simultaneous Corona Setting

If the Light and Dark Potentials on the drum readings are unstable, the Electrostatic Monitor may be faulty; investigate all ESM circuitry (see figure 6-16 of this manual and paragraph 5-16 of the Service Manual).

If the light and dark potentials are stable yet, the simultaneous and primary corona currents are unstable, the suspected source of the problem may a corona system problem (see figures 6-17 and 6-18).

4. The following procedure may be used to verify the operation of the ESM/Corona System circuitry:

   (a) With the ES Loop disabled, initiate modify command 341 (Simultaneous Corona Setting) and 331 (Primary Corona Setting).

   (b) Verify that the following conditions result as the the settings are modified:

      (1) Increasing the Primary and Simultaneous Corona Settings should result in the increase of Primary and Simultaneous Currents.

      (2) As the Primary Corona Setting is increased, the Dark and Light Potentials should increase.

      (3) As the Simultaneous Corona Setting is increased, the the Dark and Light Potentials should decrease.

   If the corona currents do NOT change as the settings are increased, a problem may exist in the corona system's high voltage circuitry (see figure 6-17 and 6-18).

   If the currents changed, yet the dark and light potentials readings do NOT change, the ESM may not be correctly measuring the drum potentials, investigate the ESM circuitry.

   If the currents and dark and light potentials correctly track the settings, the problem may exist with either the drum or the corona assemblies.

Vacuum System Malfunctions

The printer's vacuum system is used in the electrophotographic process for cleaning the photoconductive drum, and is used in the fusing system for holding the paper to the preheater surface and for collecting fumes given off by the paper.
If the vacuum system is malfunctioning, a wide range of problems could result i.e., "blotches" in the printed output, poor fusing, excessive paper jams, print smears on the printer top cover and on the leading and trailing edges of the printed output.

Possible causes:

a. Broken Vacumm System Belt
b. Clogged Vacuum Line
c. Overfilled Waste Disposal Bottle
d. Vacuum Motor
e. Clogged Cleaner Station Assembly
f. Vacuum Door Seal (leaks)
g. Vacuum Hose (leaks)
h. Vacuum Control Circuitry
   - Control PCA
   - AC Power PCA
   - Triac PCA
   - Q9 Triac Bracket

Recommended procedure:

a. Initiate service tool command 676 (Enable High Voltage System) and open the printer front door; the printer front door must be opened within three seconds of initiating the command.

   Initiate device on command 701 (Vacuum Motor). The enabling of the vacuum motor should apparent due to the loud noise emitted by the vacuum system. If the motor did NOT start, investigate the operation of the vacuum control circuitry (see figure 6-3). If the vacuum motor is operational, perform the following vacuum system checks:

1. Try to open the vacuum system door (see figure A Para 5-9 of the Service Manual). If the door can not be opened easily the vacuum system is correctly working.

2. Visually verify if the toner disposal bottle being lifted at its coupling. If the bottle is near empty the vacuum system should create sufficient vacuum to lift an empty disposal bottle.

3. Open the printer top cover, note if there is sufficient vacuum to hold the paper to the preheater surface.

4. If the unit has a vacuum splice feature, check for the presence of vacuum at the splice table.

Close the printer front door. If insufficient vacuum is detected after performing any of the above checks, the vacuum system may be blocked and it may be necessary to disassemble the vacuum piping.

b. Remove the drum cleaner station (see section V of the Service Manual). Inspect the station checking for any signs blockage; clean if necessary. If the cleaner station indicates any signs of insufficient vacuum, perform the following steps:

1. Remove the cleaner station from the printer.

2. Remove the EP Top Close Out Cover. The panel is to the right of the review window and is secured by four screws. When the cover is removed and the cleaner station is removed, the cleaner station vacuum port is revealed on the interior side of the back EP wall.

3. Initiate device on command 701 (Vacuum On) and check for vacuum by placing thumb over the cleaner station vacuum port. If no vacuum is present, the vacuum piping may be blocked; clean if necessary.

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4-1. INTRODUCTION

This Chapter of the manual provides adjustment and replacement procedures for HP service personnel.

4-2. TOOLS REQUIRED

In addition to the hand tools normally included in service tool kits, the following special tools and equipment are required to perform adjustment procedures and replacement of parts:

- Corona Stringing Tool (HP part number 02682-60451)
- Go/No-Go Gauges (HP part number 02682-20533 and -20534)
- Drum/Developer Roll Spacing Tool (HP part number 02682-60441)
- Magnet Angle Alignment Tool (HP part number 02682-60606)
- Paper Drop Cloth, 5 each (HP part number 9281-0460)
- Paper Misfold Sensor Adjustment Tool (HP part number 02682-20503)
- Plastic Gloves, box of 25 pr (HP part number 92193G)
- Retraction Blade Adjustment Tool (HP part number 02682-20458)
- Cleaner Blade/tension gauge (HP part number 8750-0058)
- Vactra Lubricant # 2 (6 ounce)(HP part number 02682-60549)
- Moly-Cote G (HP part number 6040-0521)
- Kodak Lens Tissue, Kodak Part Number KP-62647-A or equivalent
- Foam-tipped swabs, box of 50 (HP part number 9300-0468)

4-3. HOW TO USE THIS CHAPTER

This chapter of the manual is arranged in alphabetical order according to the name of the assembly being adjusted or removed, or the name of the procedure being performed. Refer to the Table of Contents or the reference index if help is needed to find a procedure.

4-4. AC POWER PCA ADJUSTMENT

The AC Power PCA adjustment must be performed whenever this PCA is replaced to ensure the displayed line voltage and the actual line voltage are equal. To verify this reading, proceed as follows:

EQUIPMENT NEEDED

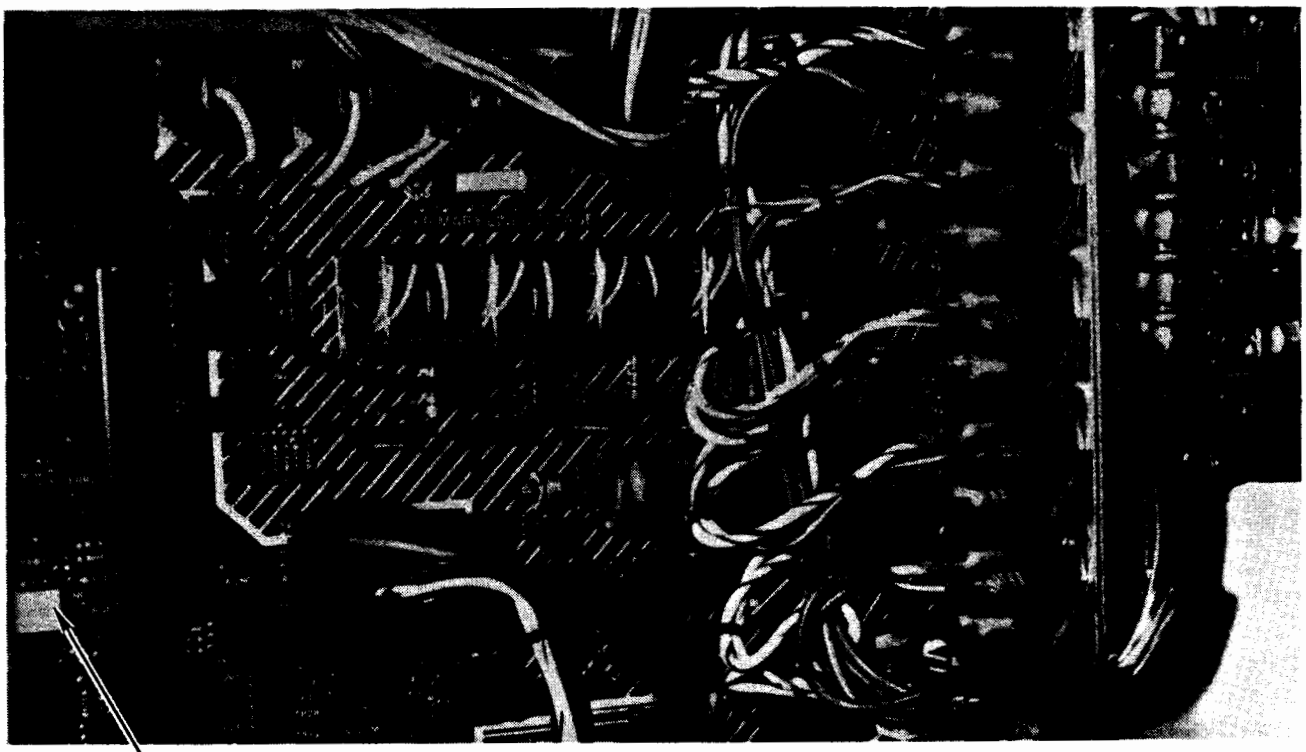
- Digital Voltmeter (DVM)

Line Voltage Adjustment

A. Set the rear MAIN POWER breaker to OFF.

B. Remove the rear panel.

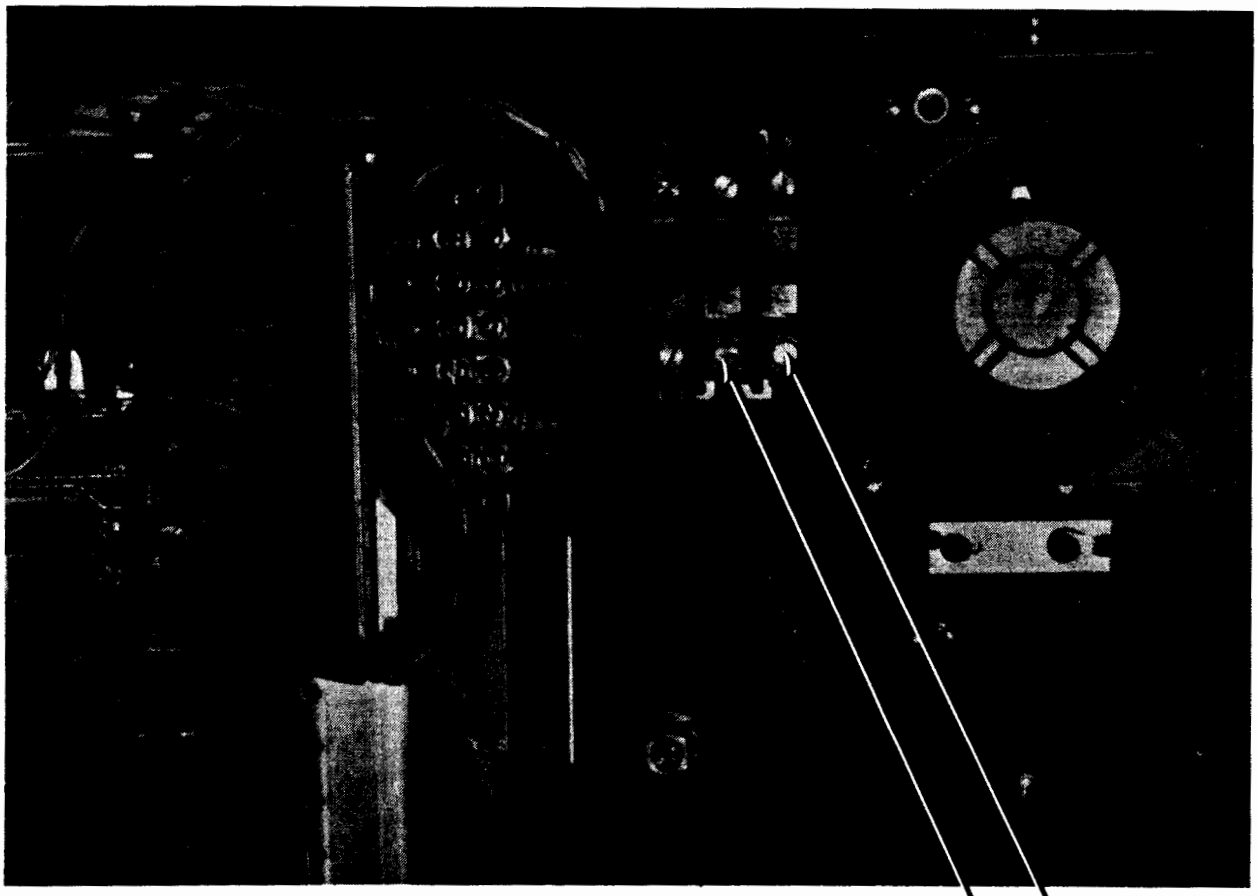
C. Remove the four screws which secure the plastic high voltage shield covering the components shown in Figure 4-1.



1. Line voltage adjustment potentiometer

Figure 4-1. AC Power PCA.

D. Connect the voltmeter across the wires shown in Figure 4-2. The voltmeter should be set to indicate voltages up to 260 VAC.



1. Connect voltmeter here (orange wire)
2. Connect voltmeter here (violet wire)

Figure 4-2. Line Voltage Measurement.

E. Set rear MAIN POWER breaker to ON.

F. Record the voltage measured; the voltage should measure between 187 to 252 VAC.

G. Key in 1196, ENTER to show the line voltage on the display and compare that value with the one measured in step F. If the values do not compare, proceed to step H. If the values do compare, proceed to step I.

H. Adjust the LINE VOLTAGE ADJ potentiometer (Figure 4-1) on the AC Power PCA until the display indicates the same voltage as the voltmeter (+/- 1V).

I. Set the rear MAIN POWER breaker to OFF.

J. Disconnect the voltmeter and install the high voltage shield.

K. Install the rear panel and restore the printer to normal operation.

Preheater Adjustments

Two switches are located on the AC Power PCA which control the Preheater Assembly: switch S1 and S2. Switch S2 is the preheater enable/disable switch. This switch should be in the enable position at all times.

Switch S1 sets a reference temperature which is used by the preheater control circuitry. Under normal circumstances this switch should be set to position 3 which is the equivalent to 130 degrees centigrade. This switch may be set to position 4 if the printer is operating in an extremely cool environment. If any question exists concerning the correct switch position, compare the "Fusing System" parameters listed in the Self Test printout with those listed in a known good Self Test printout. If the parameters listed are different, change the switch setting by one. Table 4-1 shows the different target temperatures for different switch settings.

Table 4-1. Target Temperature Switch Settings.

switch (S1) position	target temperature (degrees centigrade)
0	100
1	110
2	120
3	130
4	140
5	150
6-9	disables preheater

NOTE

Low preheater temperatures result in poor fusing.

4-5. AC POWER PCA REMOVAL

To remove the AC Power PCA, proceed as follows:

A. Set the rear MAIN POWER breaker to OFF.

B. Remove the printer rear panel.

C. Remove the four screws which secure the plastic high voltage shield covering the AC Power PCA.

D. Remove the temperature sensor cap from the temperature sensors by pulling on the two plastic fasteners (see Figure 4-3).

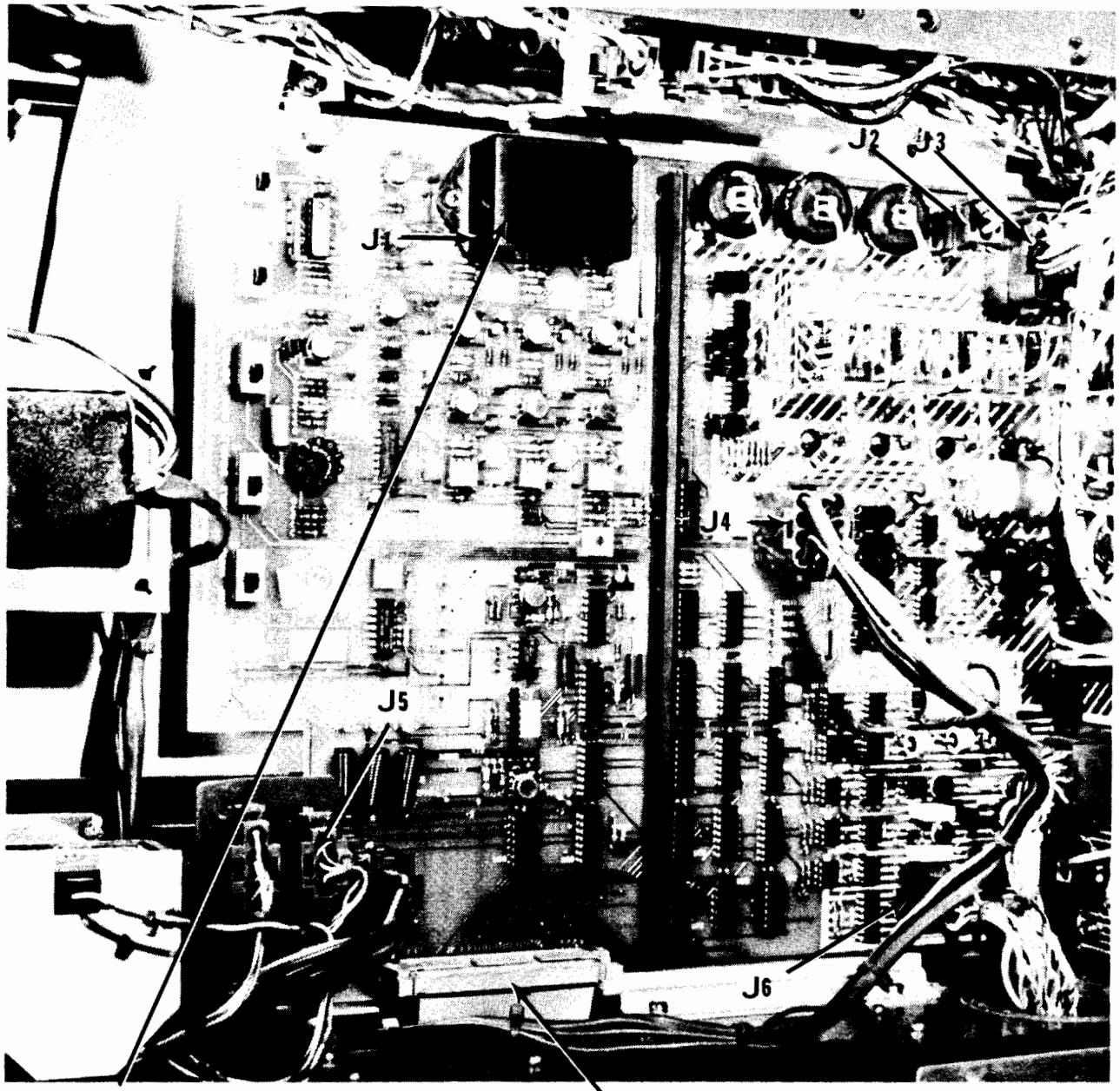


Figure 4-3. AC Power PCA.

E. Disconnect the seven connectors shown in Figure 4-3 (J1 through J7). (J1 is located behind the temperature sensor cap).

F. Loosen the two screws which secure the top rail on the PCA.

G. Loosen the screw fastener located at the upper left corner of the PCA.

H. Slide the AC Power PCA toward the left to disconnect it from the Triac PCA.

I. Lift the top rail enough to clear the top edge of the AC Power PCA, then pull the top of the PCA outward. Lift the PCA upward to free it from the bottom rail.

NOTE

The AC Power PCA Adjustment procedure MUST be performed if a new AC Power PCA is installed in the printer. If this is not done, the input voltage display (167, ENTER) will be in error. Other error messages could be displayed when no fault condition actually exists.

Install the AC Power PCA in the reverse of the procedure listed above. Perform the adjustment procedure in 4-4 of this manual.

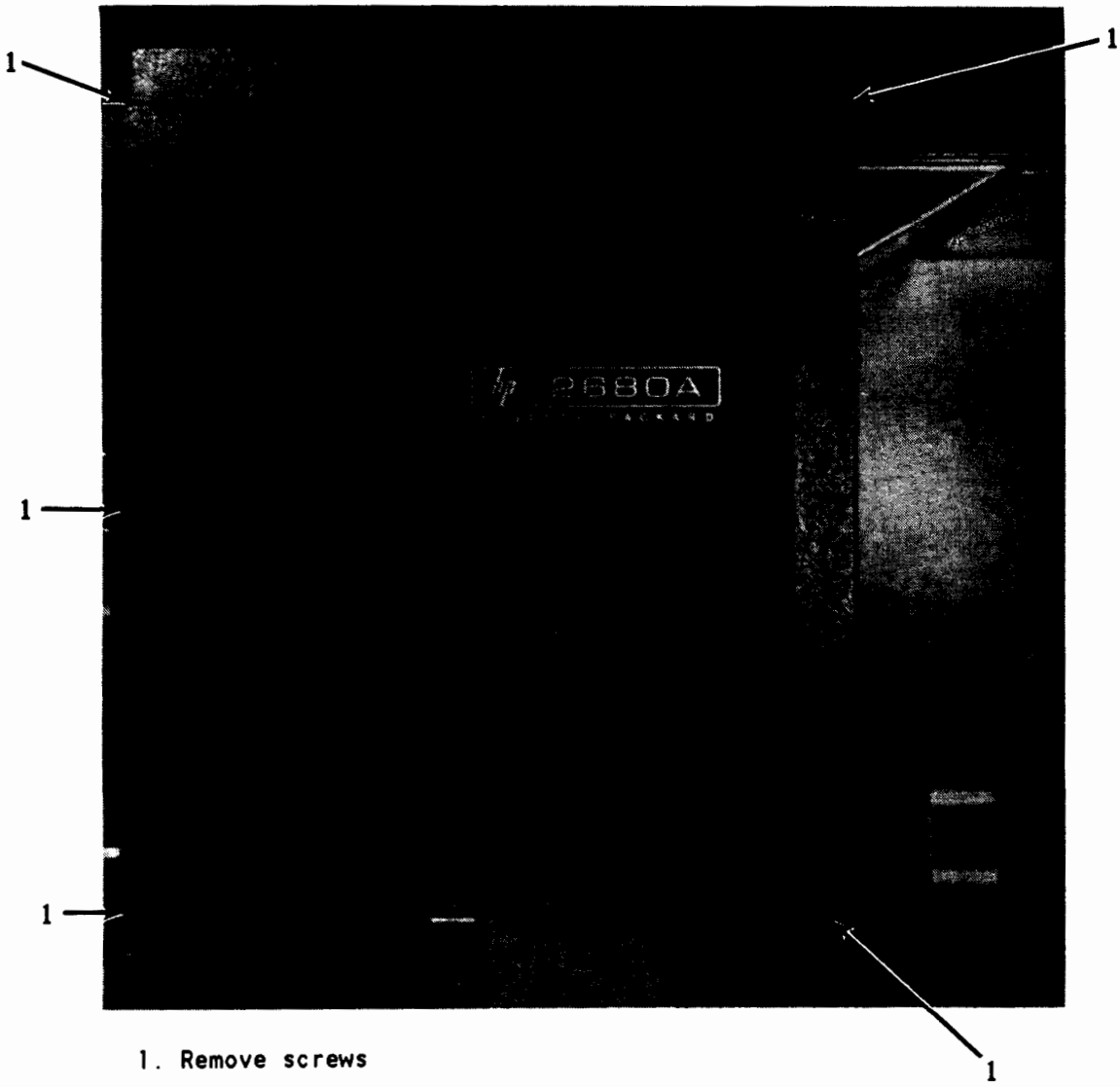
4-6. CHAIN BOX REMOVAL

To remove the chain box, proceed as follows:

A. Press the HALT switch on the Operator Control Panel. Press the STACK DOWN switch on the Paper Control Panel, then clear the stacker of paper.

B. Open the printer top cover and paper output door.

C. Remove the five screws which mount the paper control panel bezel. The screws are located around the bezel as follows: one screw on the center left side, one screw each on the right bottom and left bottom sides, and two flat-head screws on the top side (see Figure 4-4).



1. Remove screws

Figure 4-4. Paper Control Bezel Removal.

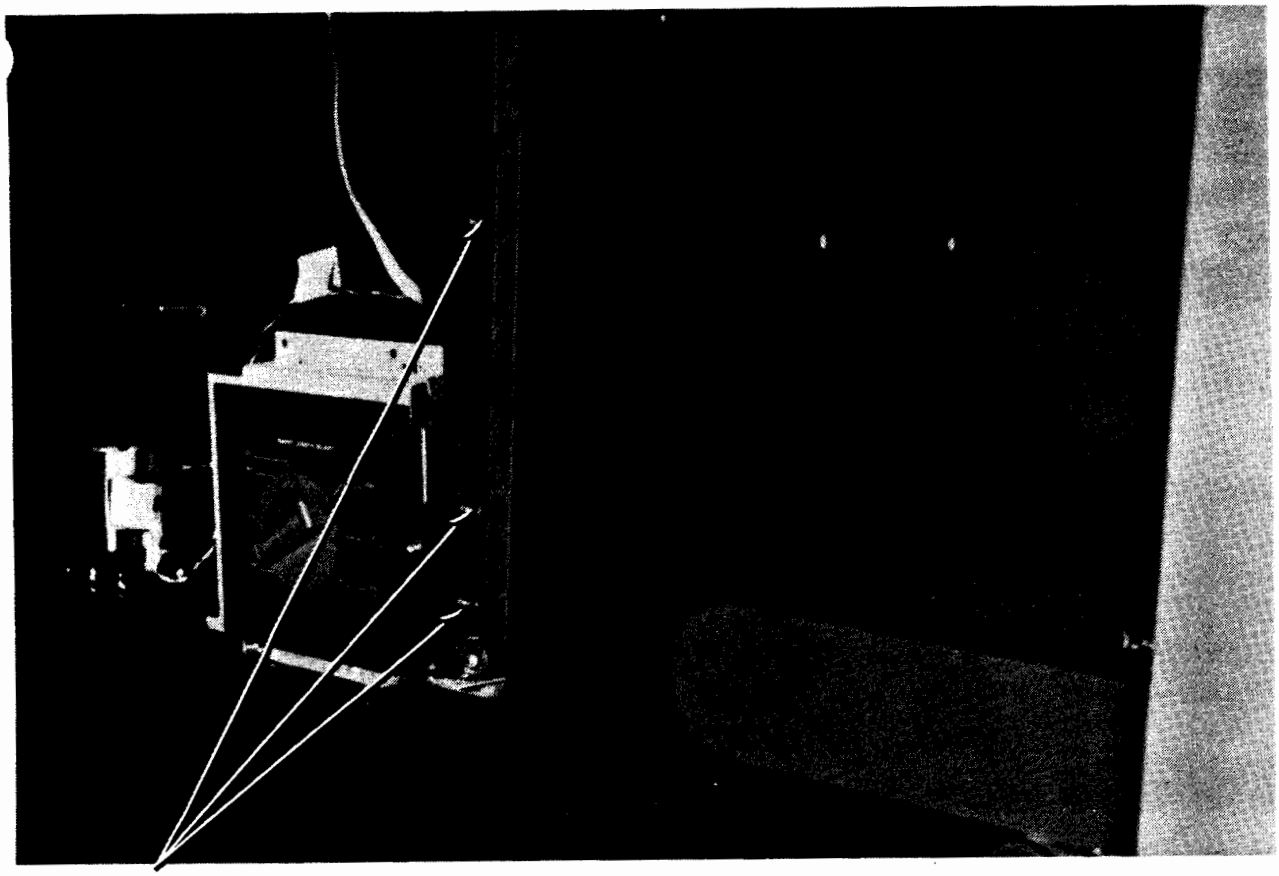


Figure 4-5. Paper Control Panel (Right Side).

D. Remove the paper control panel bezel and disconnect the ribbon cable inside.

E. Remove the three screws from the chain box right-side panel (see Figure 4-5) and remove this panel.

F. Rotate the Paper Length Adjust knob to the 12.0 position.

G. Remove the printer rear panel.

H. Remove the metal guard from around the elevator drive belt (see Figure 4-6).

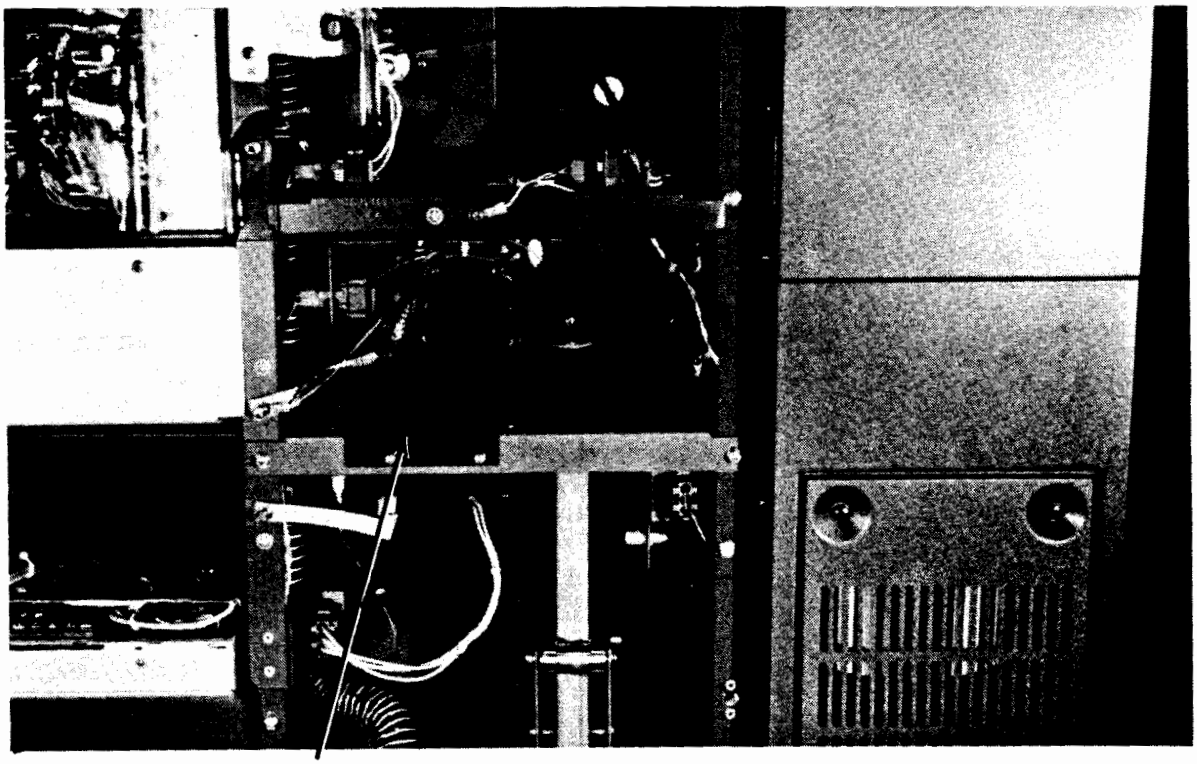
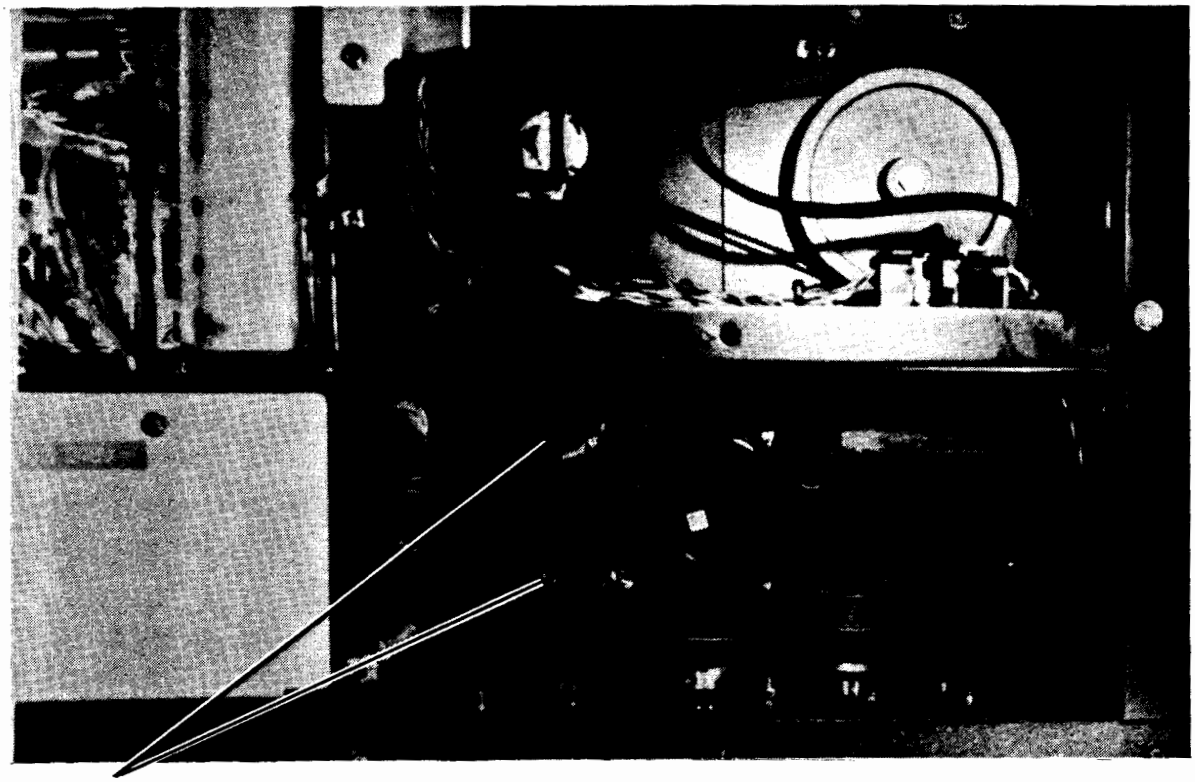


Figure 4-6. Elevator Drive Belt Guard.

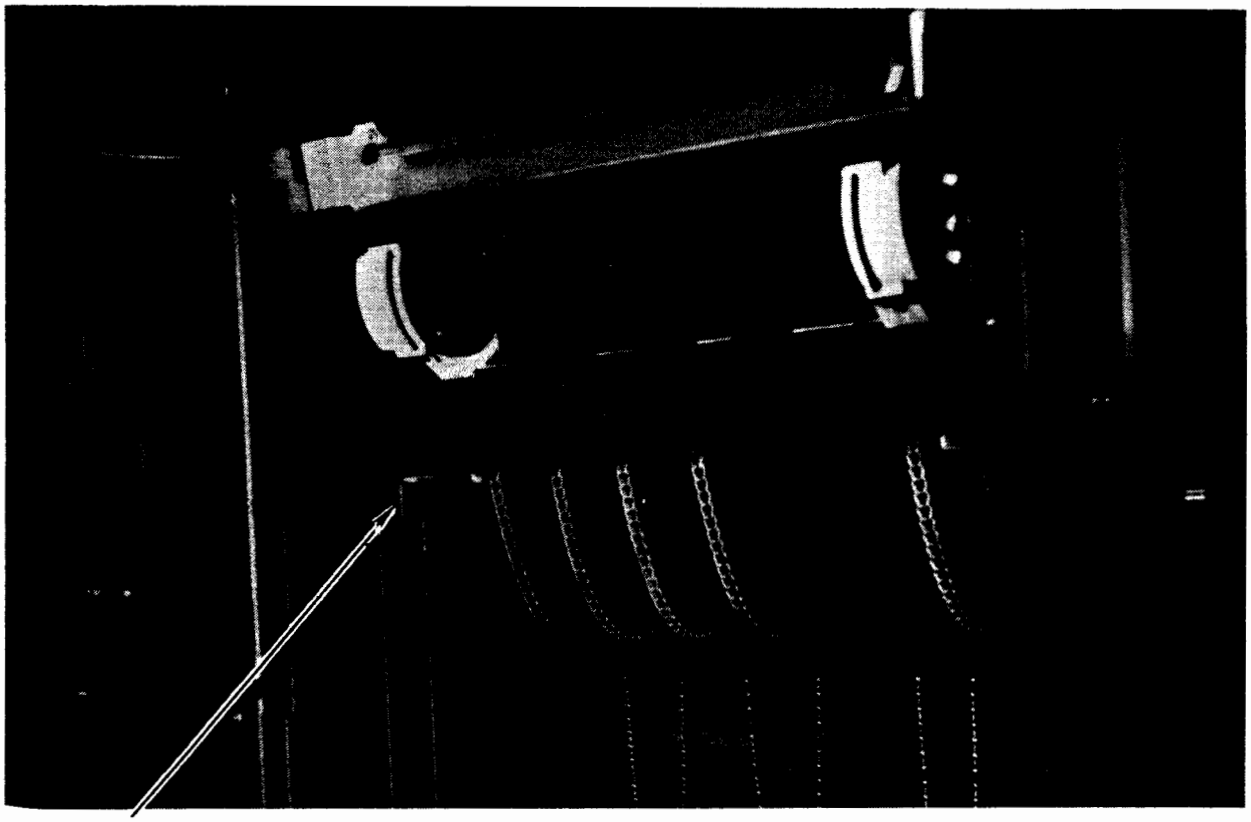


1. Remove 2 screws

Figure 4-7. Web Tension Motor.

I. Remove the two screws located near the top left corner and bottom left corner of the web tension motor (see Figure 4-7).

J. Remove the small panel at the front of the printer located around the chain drive gear and chain drive shaft (see Figure 4-8).



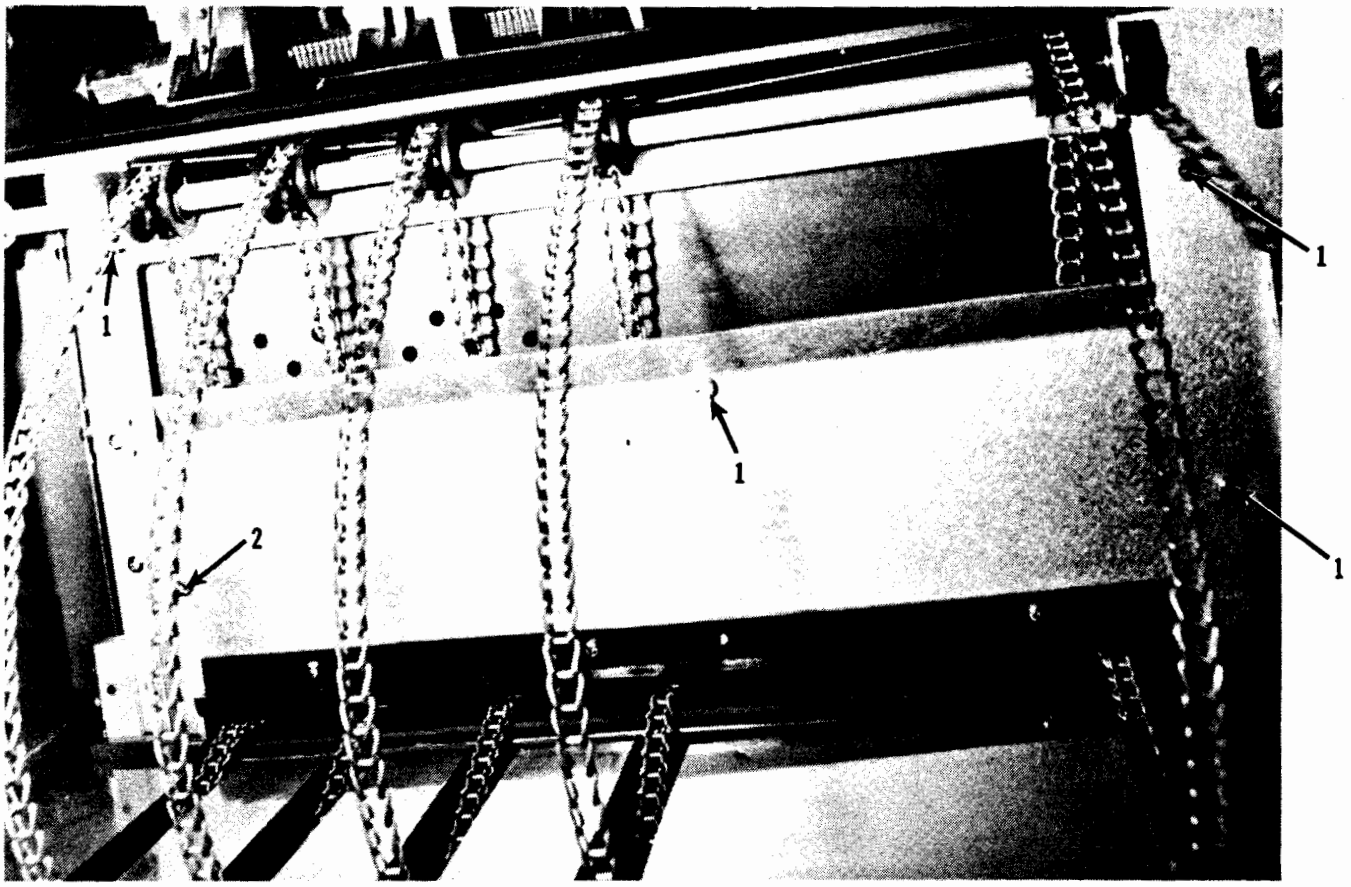
1. Remove gear panel

Figure 4-8. Gear Panel.

CAUTION

Support the chain box with your hand while removing the last mounting screw. The center screw must be the last screw removed to help balance the chain box and avoid bending the chain box case.

K. Remove the five screws which mount the chain box to the printer. The four corner screws must be removed first, then the center screw. These screws are located as shown in Figure 4-9.



1. Remove 4 screws
2. No recess spring on this screw

Figure 4-9. Chain Box (Bottom View).

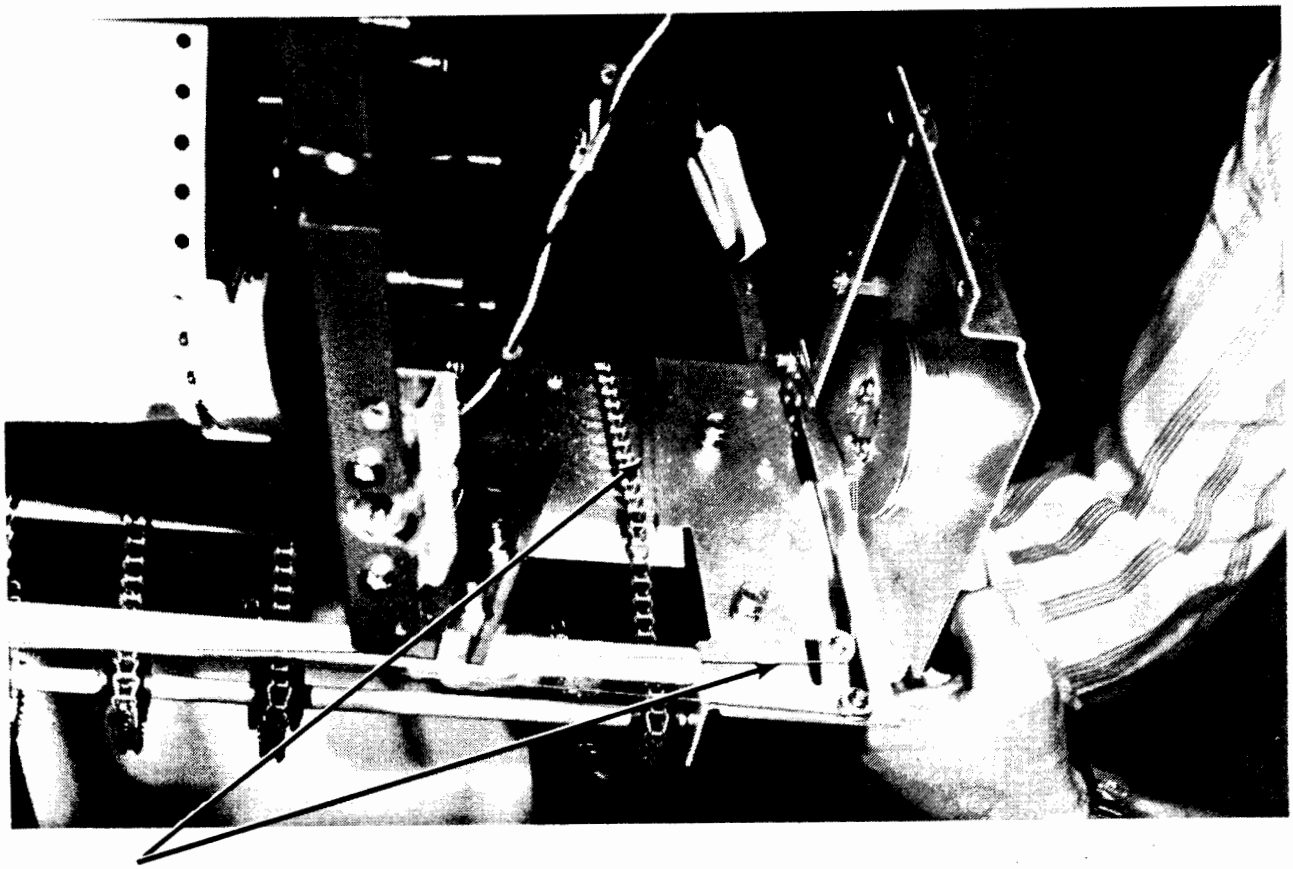
L. Pull the chain box straight forward approximately 25 mm (1 inch) to clear the drive gears, then down. The chain box is now free of the printer.

To install a chain box in the printer, proceed as follows:

A. Ensure that the springs are installed over the stand-offs on the top of the chain box mounting plate. Note, the left-rear standoff does not have a recess spring, however a spacer is required.

CAUTION

Ensure that the wire looped around the pulleys inside the chain box (see Figure 4-10) does not catch on the metal lip while the chain box is being moved into position. The wires could be frayed or cut.



1. Wire

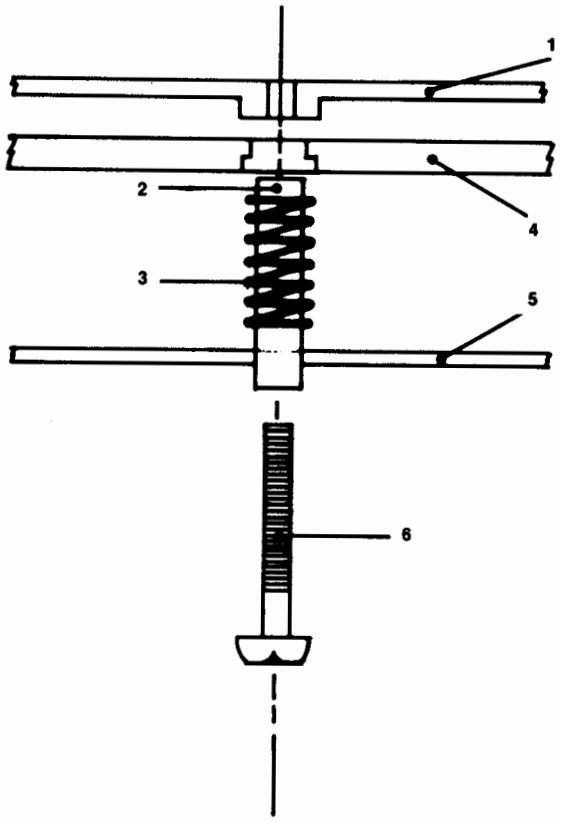
Figure 4-10. Chain Box.

B. Support the chain box in a level position and engage the gear at the rear of the chain box with the upper side of the gear on the rear wall of the printer.

C. Hold the chain box in position until the center screw is installed and rotated several turns (but not tightened).

D. Start the remaining four screws, but do not tighten.

E. Adjust the chain box until the standoffs are set into the recesses as shown in Figure 4-11. Tighten all five screws.



1. T bar
2. Stand off
3. Recess Spring
4. Frame
5. Chainbox assembly
6. Screw

Figure 4-11. Chain Box Standoffs.

F. Lift the front, then the rear corners of the chain box to ensure that there is free movement of the box up and down and that the safety micro-switch activates (a audible click can be heard). If not, repeat step D and step E.

G. Reverse the procedures in step A through step D to return the printer to normal operating conditions.

4-7. CONTROL PCA ADJUSTMENT

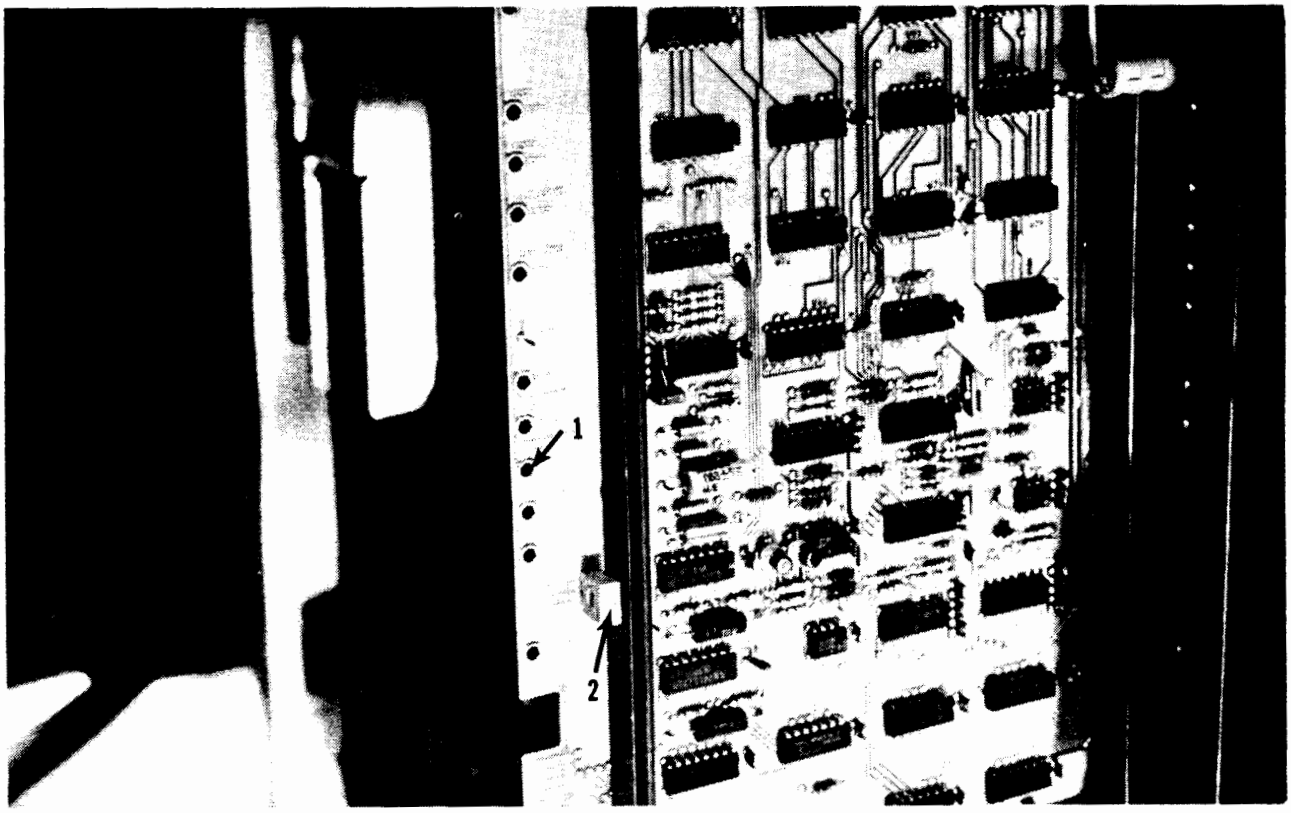
The following procedure describes the tension motor speed adjustment which should be performed whenever a new Control PCA or a new Tension Motor is installed in the printer. To adjust the tension motor speed, proceed as follows:

EQUIPMENT NEEDED

- DC voltmeter
- Small, flat-blade screwdriver

A. Remove the rear panel of the printer.

B. Rotate the TENSION SPEED CONTROL potentiometer (see Figure 4-12) fully clockwise.



1. Tension speed potentiometer
2. Tension motor speed test point

Figure 4-12. Control PCA.

C. Load paper if not already loaded.

D. Connect the voltmeter test leads to ground and to the TENSION MOTOR SPEED test point (TP 24). Set the voltmeter to measure between 0 to +5 VDC.

E. Press and hold the PAPER FWD key on the paper control panel while observing the voltmeter display. Record the maximum voltage measured (this will be a negative voltage).

NOTE

Before proceeding through this adjustment, ensure that the Run Tension is set to 10. Refer to the Tension Motor Setting Adjustment procedure, 4-49.

F. Remove paper from the output tractors.

G. Key in 631, ENTER, 2680, ENTER to enter the service command mode.

H. Key in 792, ENTER, RUN to enable the tension motor.

I. Adjust the TENSION SPEED CONTROL potentiometer until the minimum voltage observed on the voltmeter is 1.1 times the voltage recorded in step E.

J. Key in HALT, then 600, ENTER to halt the tension motor.

NOTE

Ensure that the Run Tension is set to it's nominal tension level if different from the default tension setting.

K. Key in 630, ENTER to return the printer to normal operation.

4-8. CORONA WIRE REPLACEMENT

If any of the corona wires break, become loose or become coated with any material that cannot be cleaned off using swabs moistened with isopropyl alcohol, the wire must be replaced. High background (where the paper appears dirty or gray) or streaking (light colored vertical lines) indicates that grid wires or corona wires may be loose or degraded and should be replaced. To replace any of the corona wires, proceed as follows:

EQUIPMENT NEEDED:

- Corona Stringing Tool (HP part number 02682-60451)
- Corona Wire (7225-0312)
- Screwdriver (Flat-Blade)
- Screwdriver (Cross-Tipped)
- Lint free swabs and isopropyl alcohol

PROCEDURE

A. Place the Front ON/OFF switch and the rear MAIN POWER breaker to OFF if not presently OFF.

B. Open the printer's front door. Open the printer top cover and EP closeout door.

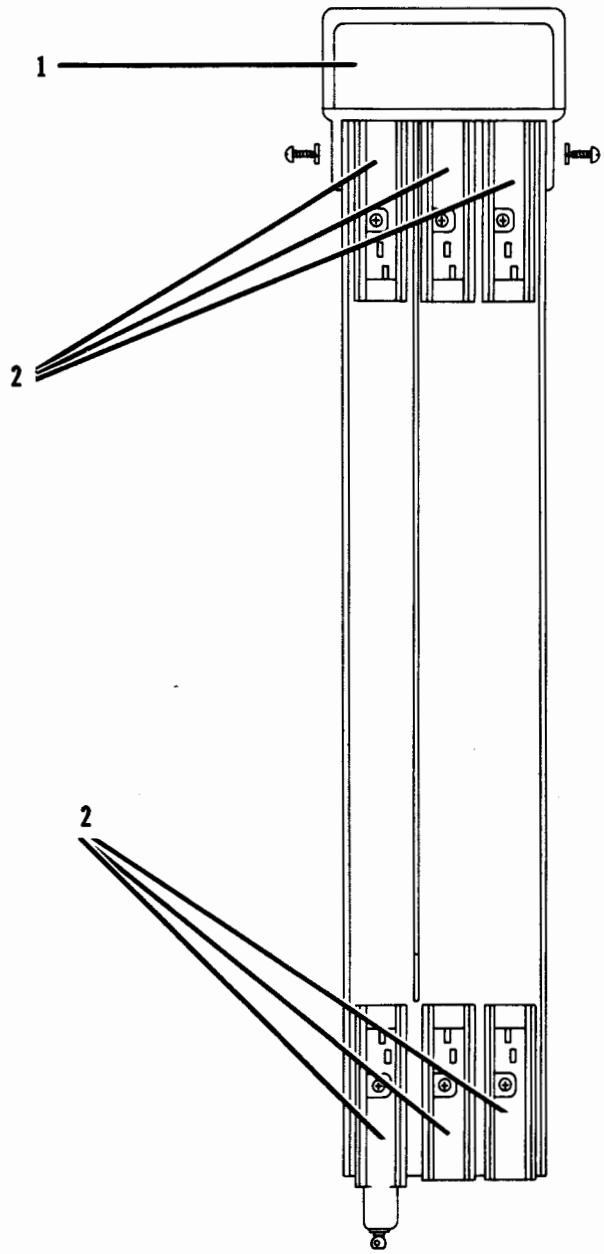
C. Remove the three corona assemblies by grasping the respective corona handle (L-shaped bracket) labeled either PRIMARY, SIMULTANEOUS, or TRANSFER and gently pull outward away from printer.

For defective or broken corona wire replacement, refer to individual procedures for the Primary Corona, the Simultaneous Corona, the Simultaneous Grid Frame, or the Transfer Corona as listed below:

Primary Corona Wires

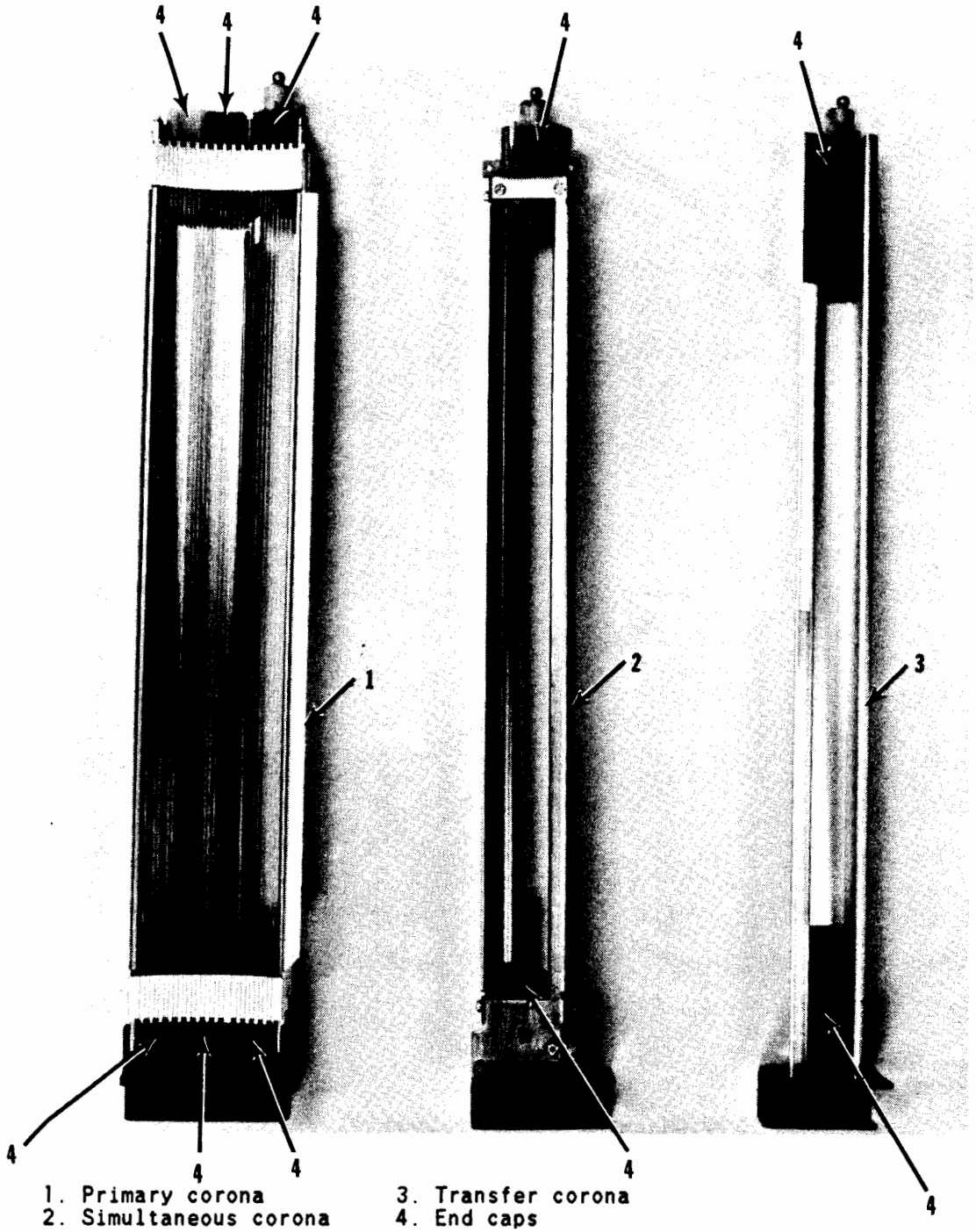
CAUTION

Wash hands thoroughly with soap before stringing corona wire. Skin and perspiration residues (salt deposits) on the end blocks can cause assembly failure.



1. Corona handle
2. End caps

Figure 4-13. Primary Corona (Screen Removed).



1. Primary corona
2. Simultaneous corona
3. Transfer corona
4. End caps

Figure 4-14. Corona Assemblies.

A. Remove the Primary Corona Screen from the corona assembly.

B. Remove the two cross-hatched screws which secure the corona handle (see Figure 4-13) to the corona assembly.

C. Remove the six end caps (see Figure 4-14) by sliding the end caps outward off the end blocks of the corona assembly.

D. Loosen the three cross-hatched screws at the end ball connector end of the corona assembly, see Figure 4-15.

E. Remove the three cross-hatched screws and their D-shaped washers at the handle end of the corona assembly (see Figure 4-15). Loosen the three remaining screws. Remove any wires or fragments from the corona assembly.

F. Install the Corona Stringing Tool (02682-60451) to the end block as shown in Figure 4-15. The tool should be firmly positioned against the endblock with the pulley facing up (Figure 4-16).

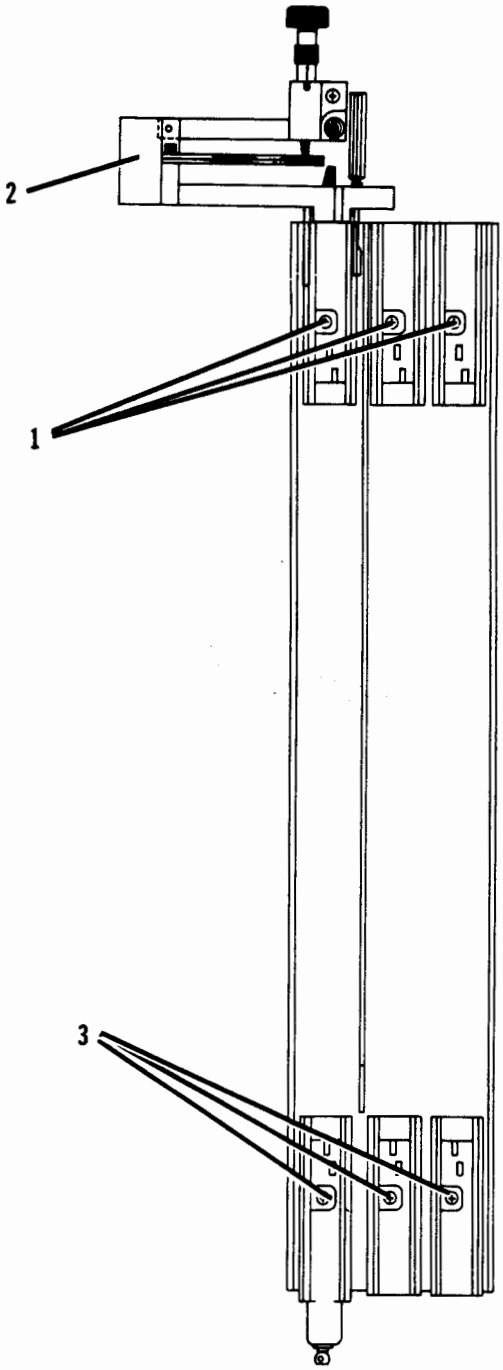
G. Loosen the tool's Tension Adjust Knob until approximately 1.5mm (1/16 inch) of the adjustment tip is exposed (see Figure 4-16).

H. Begin stringing the corona wire by sliding the wire under the D-shaped washer at endblock A (see Figure 4-17); tighten the cross-hatched screw at endblock A to hold the wire firmly in place. Ensure that the corona wire is strung around the outside of the rectangular protrusions on the end blocks.

I. String the corona wire around the pulley as shown in Figure 4-17 and back to the top of the D-shaped washer at endblock A.

NOTE

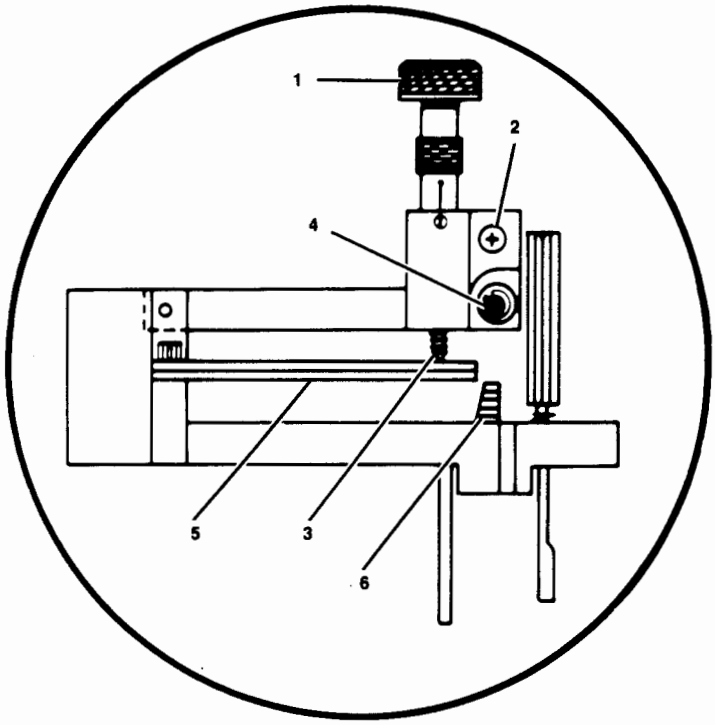
In stringing the corona wire, always keep the corona wire spool horizontal and rotate the spool to feed the wire off the spool. This prevents the wire from kinking and knotting.



1. Remove 3 screws and washers
2. Corona stringing tool
3. Loosen these 3 screws

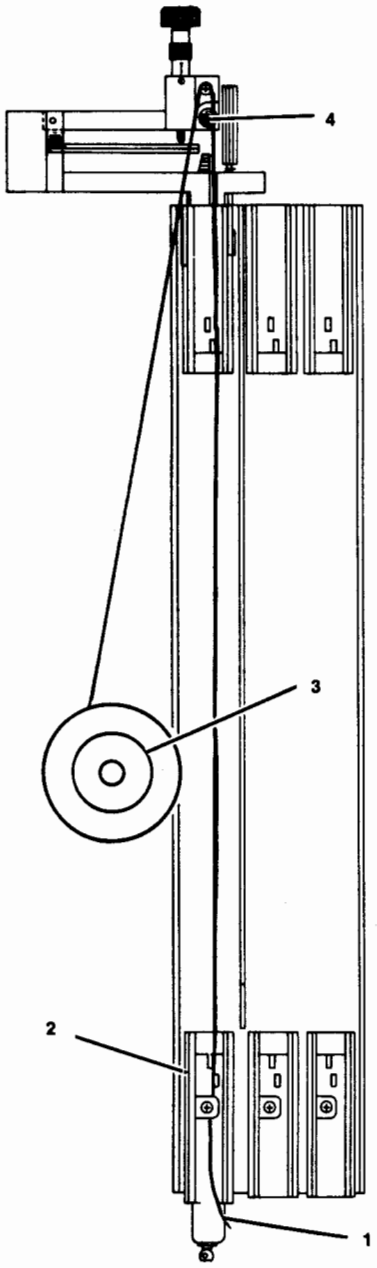
Figure 4-15. Primary Corona (Stringing Tool Installed).

J. While holding the loose end of the wire with one hand, loosen the cross-hatched screw at endblock A and slide the wire from the spool under the top edge of the D shaped washer at endblock A.



1. Tension adjust knob
2. Locking screw
3. Adjustment tip
4. Pulley
5. Tension springboard
6. Index mark

Figure 4-16. Corona Stringing Tool.

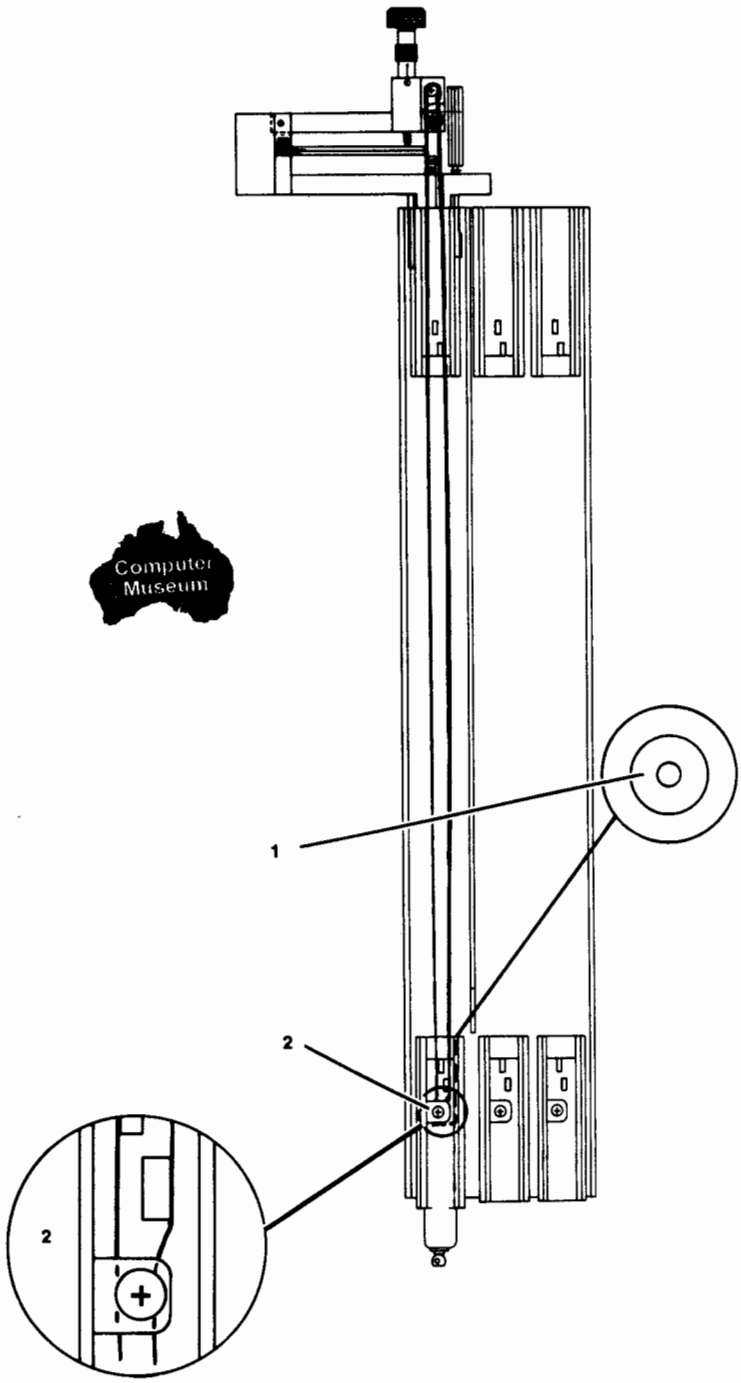


1. Start here
2. Endblock A
3. Corona wire spool
4. Pulley

Figure 4-17. Primary Corona (Start of Stringing).

K. Position the corona wire spool as shown in Figure 4-18 to keep a slight tension on the wire and securely tighten the cross-hatched screw at endblock A.

L. Rotate the corona stringing tool's Tension Adjust Knob clockwise until the tension springboard is aligned to the tension mark, see Figure 4-19.

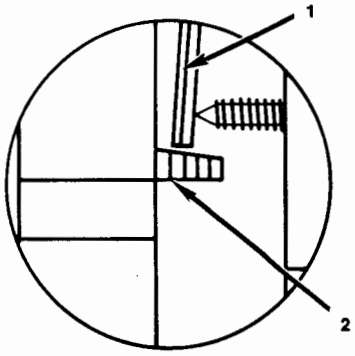


1. Corona wire spool
2. Endblock A

Figure 4-18. Primary Corona (Stringing First Two Wires).

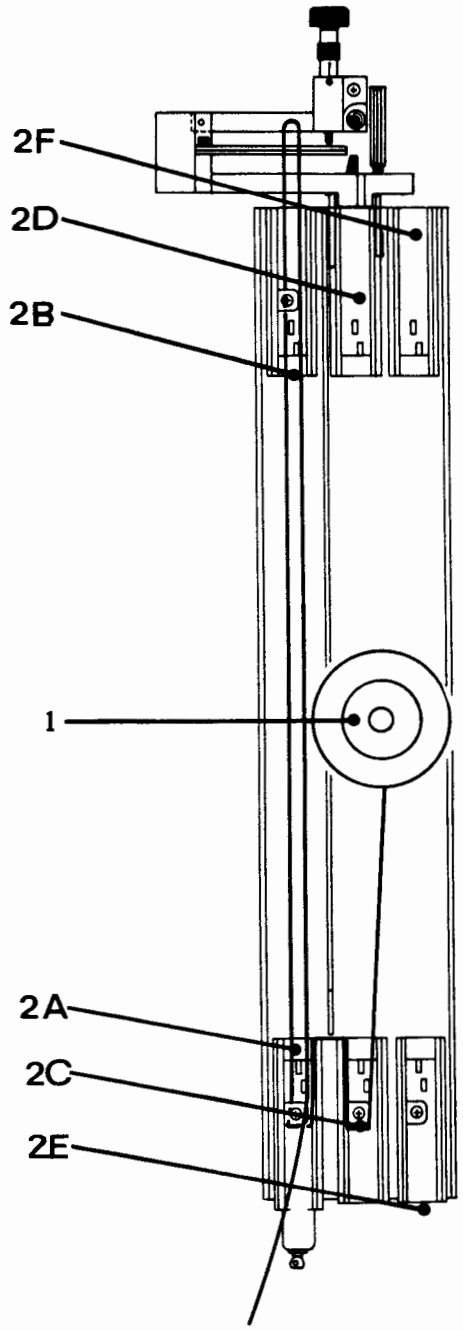
M. Install the D-shaped washer and the cross-hatched screw at endblock B (or end blocks D and E in repeat operations); securely tighten the screw. Ensure that the flat edge of the washer faces as shown in Figure 4-20.

N. Rotate the stringing tool's Tension Adjust Knob counter-clockwise and remove the corona wire from around the tool pulley. Remove the stringing tool and install the tool into endblock D.



1. Tension springboard
2. Tension mark

Figure 4-19. Corona Stringing Tool Tension Alignment.



1. Corona wire spool
2. Endblocks

Figure 4-20. Primary Corona Stringing (From Endblock A to C

O. At the ball connector end of the corona assembly, string the corona wire from endblock A to endblock C, then around the top of the D-shaped washer (see Figure 4-20).

P. String the corona wire around the tool pulley installed at endblock D, and back to the top of the D-shaped washer at endblock C.

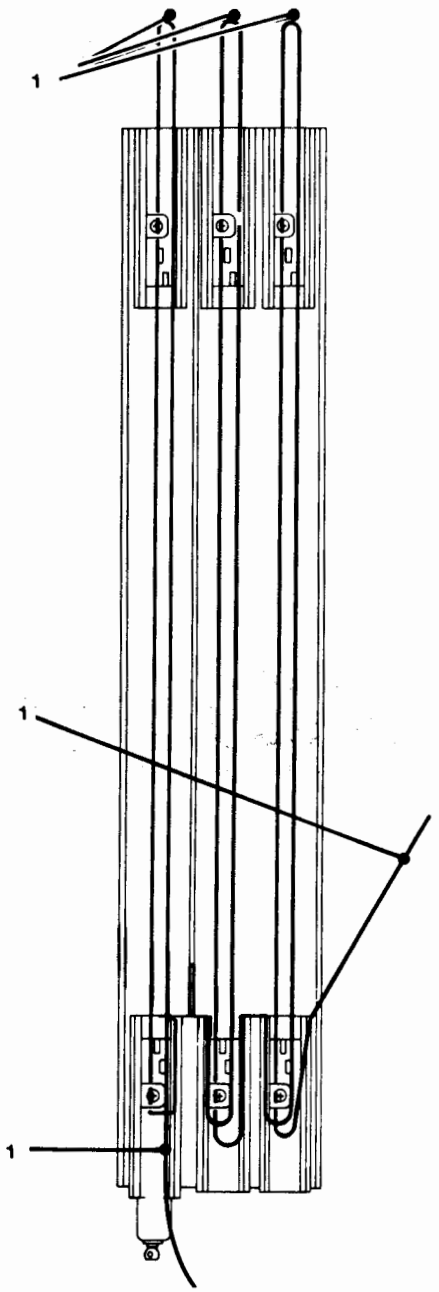
NOTE

In stringing the corona wire, always keep the corona wire spool horizontal and rotate the spool to feed the wire off the spool. This prevents the wire from kinking and knotting.

Q. Exert a slight amount of tension on the corona wire and position the corona wire spool in front of the corona assembly as shown in Figure 4-18. Securely tighten the cross-hatched screw at endblock C.

R. Repeat steps L through Q until the corona wire has been strung between all the end blocks. The wire path should look like the wire path shown in Figure 4-21. Ensure that the corona wire is strung to the outside of the endblock protrusions.

S. When all wires are strung and all screws have been securely tightened, break off the beginning end, the three wire loops, and the trailing end of the corona wire by pulling on these wires, see Figure 4-21. Ensure that no short wire ends are left.



1. Break off these ends

Figure 4-21. Primary Corona (Completed Wire Path).

T. Install the six end caps removed in step C onto the corona assembly. Ensure that the three end caps installed at the connector end of the assembly do NOT protrude so as to break the corona wire strung between end blocks A and C, and end blocks C and E.

U. Inspect the wires and clean if necessary. Refer to the Corona Cleaning procedure in this section of the manual.

V. Re-install the corona handle removed in step B. Ensure that the notched side faces the corona tracks.

CAUTION

To avoid possible damage to the drum ensure the corona assemblies are properly aligned in their guide rails before re-installing.

W. Re-install the Primary Corona Screen by reversing the instructions listed for step A of this procedure and re-install the Primary Corona Assembly in the printer where indicated.

NOTE

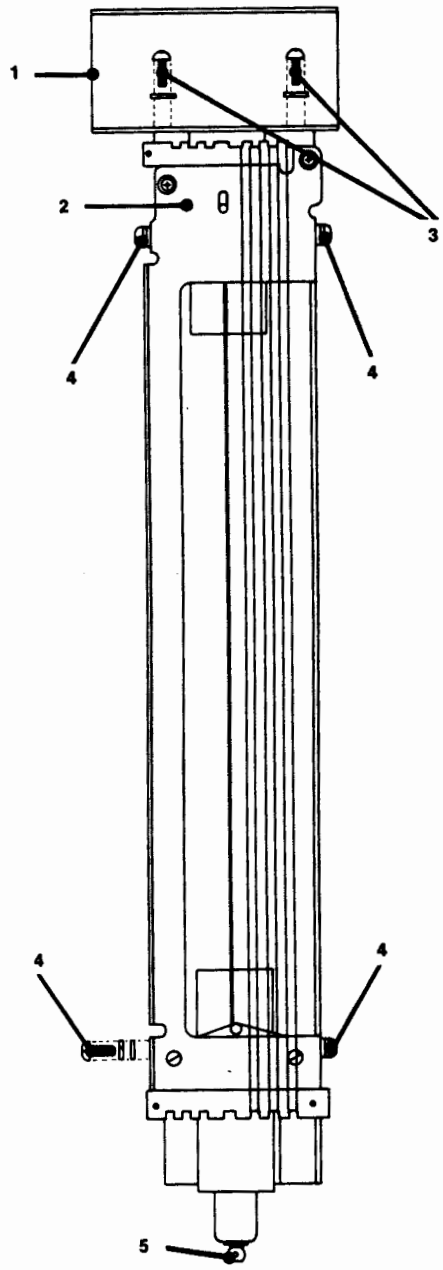
Wash hands thoroughly with soap before stringing corona wire. Skin oils and perspiration on the end blocks may cause assembly failure.

Simultaneous Corona Wire

Restring the simultaneous corona wire as follows:

A. Remove the four cross-hatched screws (see Figure 4-22) located on the sides of the grid which secure the simultaneous grid to the corona assembly. Lift up to remove the simultaneous corona grid.

B. Remove the two cross-hatched screws which secure the corona handle to the corona assembly. Remove the handle.

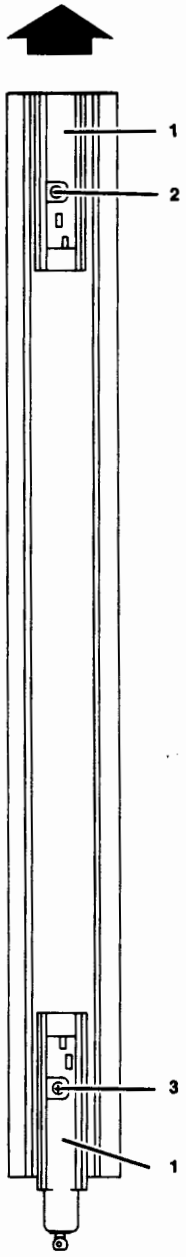


1. Corona handle
2. Simultaneous grid
3. Remove screw to remove handle
4. Remove screw to remove grid
5. End ball connector

Figure 4-22. Simultaneous Corona Assembly.

C. Remove the two corona end caps (see Figure 4-23) by sliding the end caps outward off the end blocks of the corona assembly.

D. Loosen the one cross-hatched screw at the end ball connector end of the corona assembly, see Figure 4-23.



1. End caps
2. Remove screw and washer
3. Loosen screw

Figure 4-23. Simultaneous Corona (Grid Removed).

E. Remove the one cross-hatched screw and D-shaped washer at the other corona end (opposite the end ball connector). Remove all fragments of the old corona wire.

F. Install the Corona Stringing Tool (02682-60451) on the corona assembly as shown in Figure 4-24. Ensure that the tool is firmly positioned against the endblock and the tool's pulley is facing up.

NOTE

Loosen the stringing tool's Tension Adjust Knob until approximately 1.5mm (1/16 inch) of the adjustment tip is exposed, before installing the tool to the assembly.

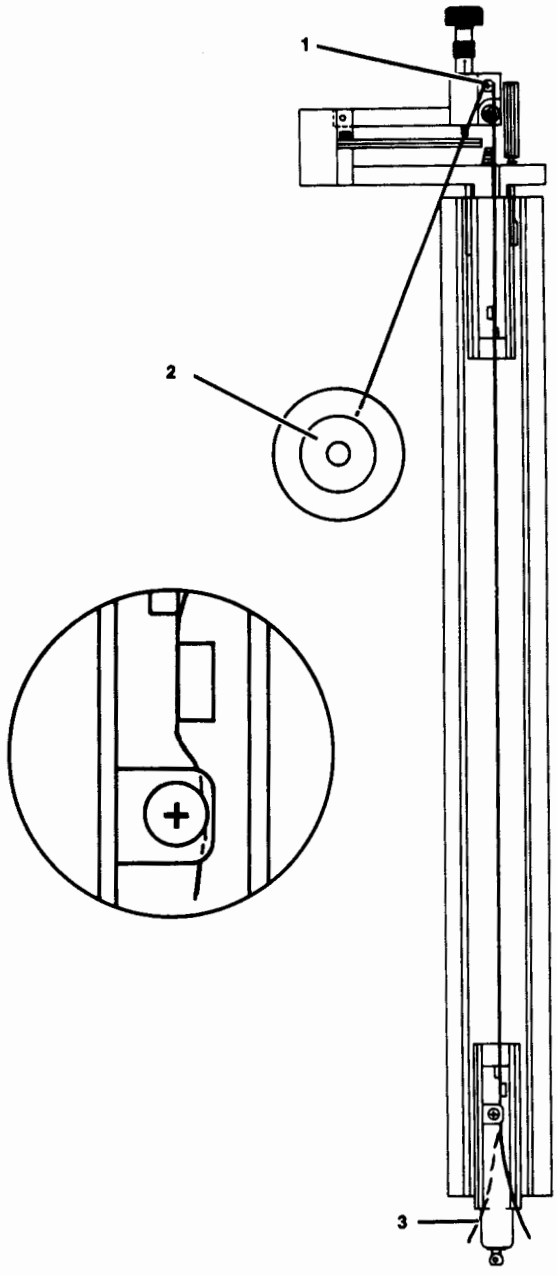
G. Loosen the stringing tool's locking screw, see Figure 4-24.

CAUTION

The locking screw is used on the simultaneous corona because only one wire is installed. Do not attempt to return the wire to the starting side or install more than one wire.

H. String the new corona wire under the D-shaped washer at the ball connector end of the corona assembly (see Figure 4-24); securely tighten the cross-hatched screw to hold the wire in place.

I. String the wire INSIDE of the endblock's rectangular protrusions, past the stringing tool pulley, and around the locking screw (see Figure 4-24).



1. Locking screw
2. Corona wire spool
3. Start here

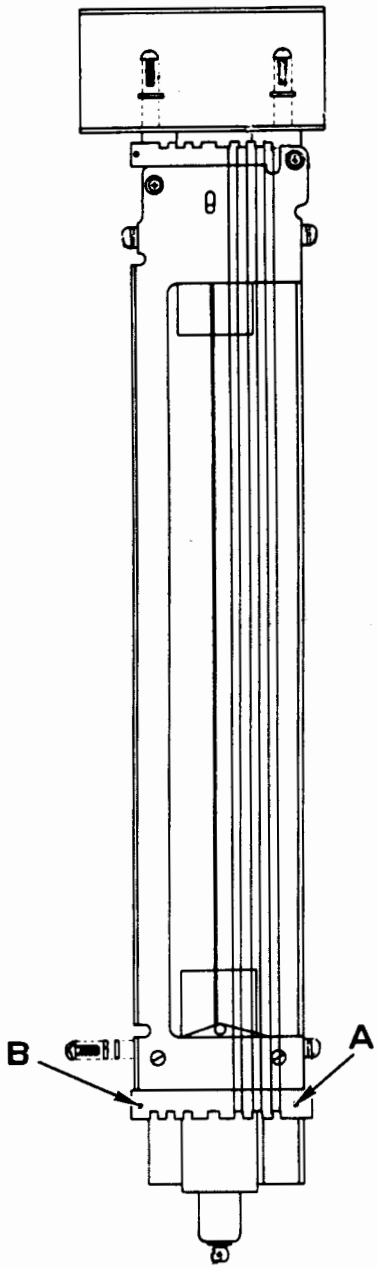
Figure 4-24. Simultaneous Corona (Start of Stringing).

NOTE

In stringing the corona wire, always keep the corona wire spool horizontal and rotate the spool to feed the wire off the spool. This prevents the wire from kinking and knotting.

J. While putting a slight tension on the corona wire, tighten the stringing tool's locking screw.

K. Rotate the stringing tool's Tension Adjust Knob clockwise until the tension springboard is aligned to the tension mark (see Figure 4-19).



1. Loosen these screws

Figure 4-25. Simultaneous Corona (Top View).

L. Install the D-shaped washer and cross-hatched screw removed in step E; securely tighten the screw in place.

M. Loosen the stringing tool's locking screw; rotate the Tension Adjust Knob counter-clockwise and remove the stringing tool.

N. Break off the leading and trailing ends of the corona wire.

Simultaneous Corona Grid Wire

Restring the simultaneous corona grid wire as follows:

A. Loosen screws A and B (see Figure 4-25). Remove all wires and ensure that no short pieces of wire remain under the washers.

B. Loosen screws C and D.

CAUTION

Wash hands before stringing the corona wire. Skin oils and perspiration on the end blocks may result in assembly failure.

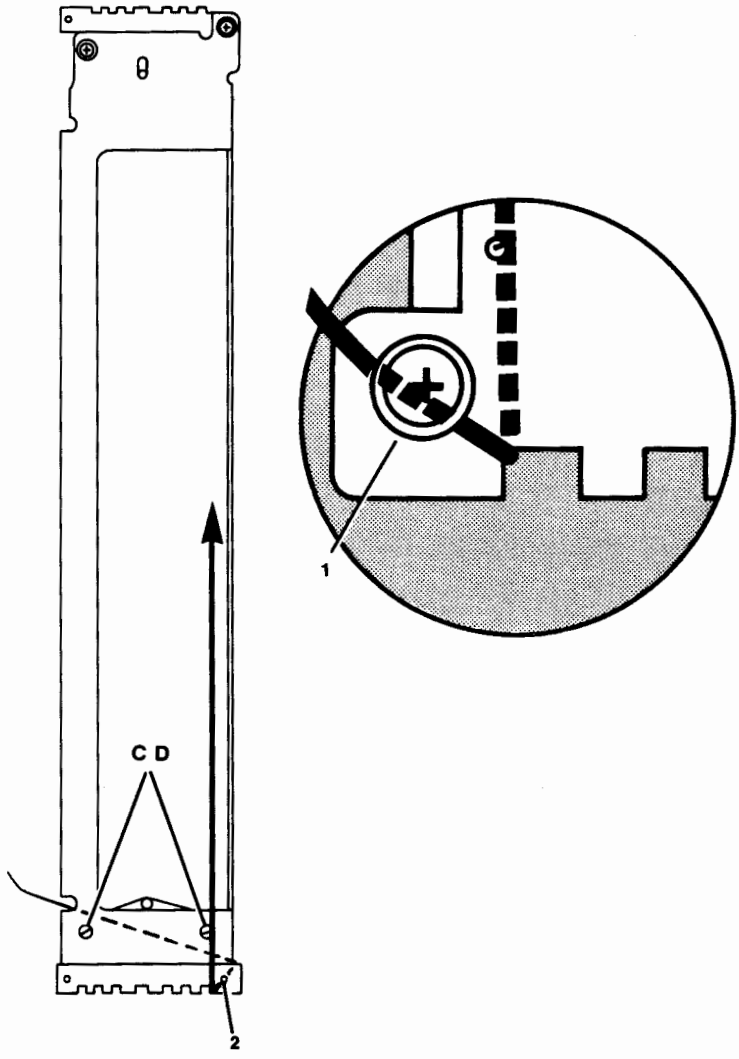
NOTE

Hold the corona grid frame carefully to avoid bending the frame.

C. Begin stringing by sliding the wire under the metal frame so that it is between the metal frame and the plastic corona wire, wrap it around screw A, then tighten screw A, C and D (see Figure 4-26).

NOTE

Insert the metal screws into the plastic threads carefully. The threads can be easily stripped by tightening the screws too much.

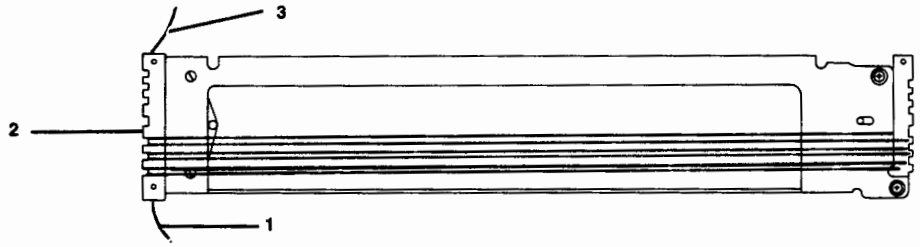


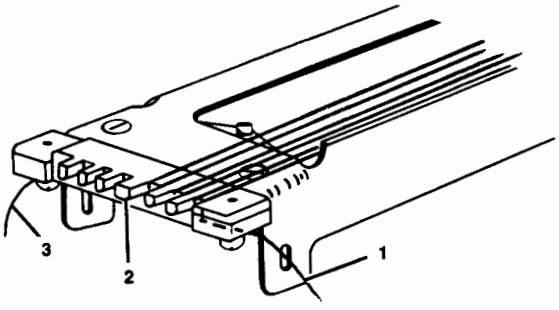
1. Screw A (top view)
2. Screw A (bottom view)

Figure 4-26. Simultaneous Corona Grid.

NOTE

In stringing the grid, ensure that the wires start at exactly the correct protrusion and are subsequently strung to the correct protrusions. Failure to do so will keep the wires from running parallel to each other, and will keep the printer from functioning properly (see Figure 4-25).





1. Start
2. Wrap around this protrusion
3. Finish

Figure 4-27. Simultaneous Corona (Completed Wire Path).

D. Pull the wire toward the opposite end of the corona, as shown in Figure 4-25. Hold the wire in place with your thumb, then pull the wire toward the opposite end again. Maintain the tension on each wire AS IT IS STRUNG, since the wire cannot be tightened after being wrapped around the protrusions.

E. Continue to string the corona grid as shown in Figure 4-27.

F. When the final strand is pulled tight, wrap the wire around the largest protrusion in the center of the end bar. Pull the wire to the top of the grid and to the end and back down to the other side of the grid. Thread the wire under screw B between the flat washer and the block (see Figure 4-27).

NOTE

If the wire becomes kinked or knotted, do not attempt to straighten it, as the wires will tend to break at those points. Remove the wire and restring the grid.

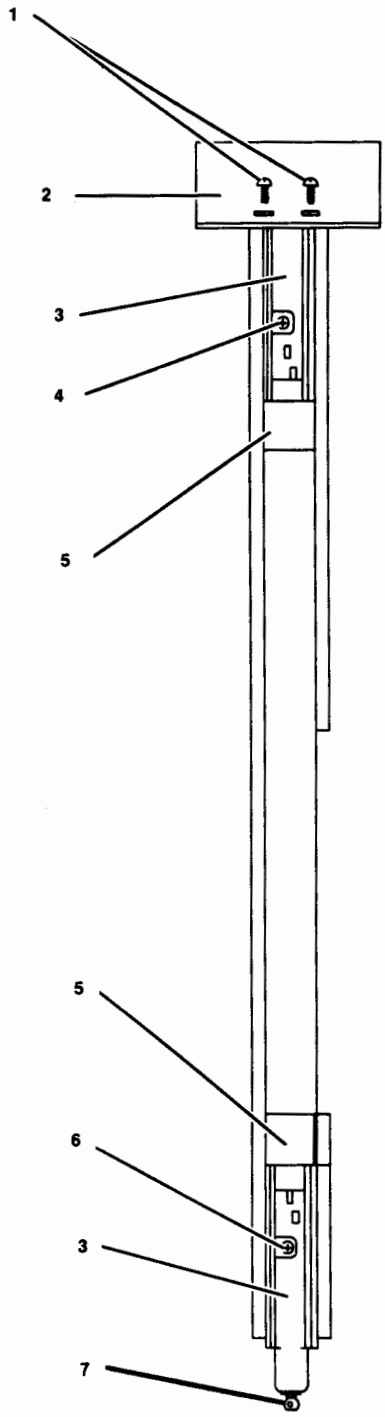
G. Tighten screw B. Break off the loose ends of the corona wires at both holddown screws.

H. Clean the grid frame if necessary. Refer to the Corona Cleaning procedure in this chapter of the manual.

I. Install the grid frame with the L-shaped metal tab toward the handle end of the corona assembly housing. The frame must be pushed down tight on the corona housing before tightening the mounting screws. The corona should resemble the one shown in Figure 4-22.

CAUTION

Ensure that the grid is placed back on the corona with the flat screws on the ball connector end. If the grid is not placed on the corona correctly, it will fit into the printer. HOWEVER, it will damage the drum.



1. Remove screws
2. Handle
3. End caps
4. Remove screw
5. Corona shield
6. Loosen screw
7. End ball connector

Figure 4-28. Transfer Corona Assembly.

J. Install the corona assembly in the printer where indicated. Ensure that the corona is placed on the tracks correctly before inserting it into the printer.

Transfer Corona Assembly

To restring the Transfer Corona, proceed as follows:

A. Remove the two cross-hatched screws which secure the transfer corona handle to the Transfer Corona Assembly. Remove the handle (see Figure 4-28).

B. Remove the transfer corona shield adjacent to the end ball connector (see Figure 4-28). The shield can be easily removed by lifting it at the flanged protrusion.

C. Remove the corona shield at the handle end of the assembly (opposite the ball connector). It may be necessary to carefully pry the shield loose with a flat-blade screwdriver.

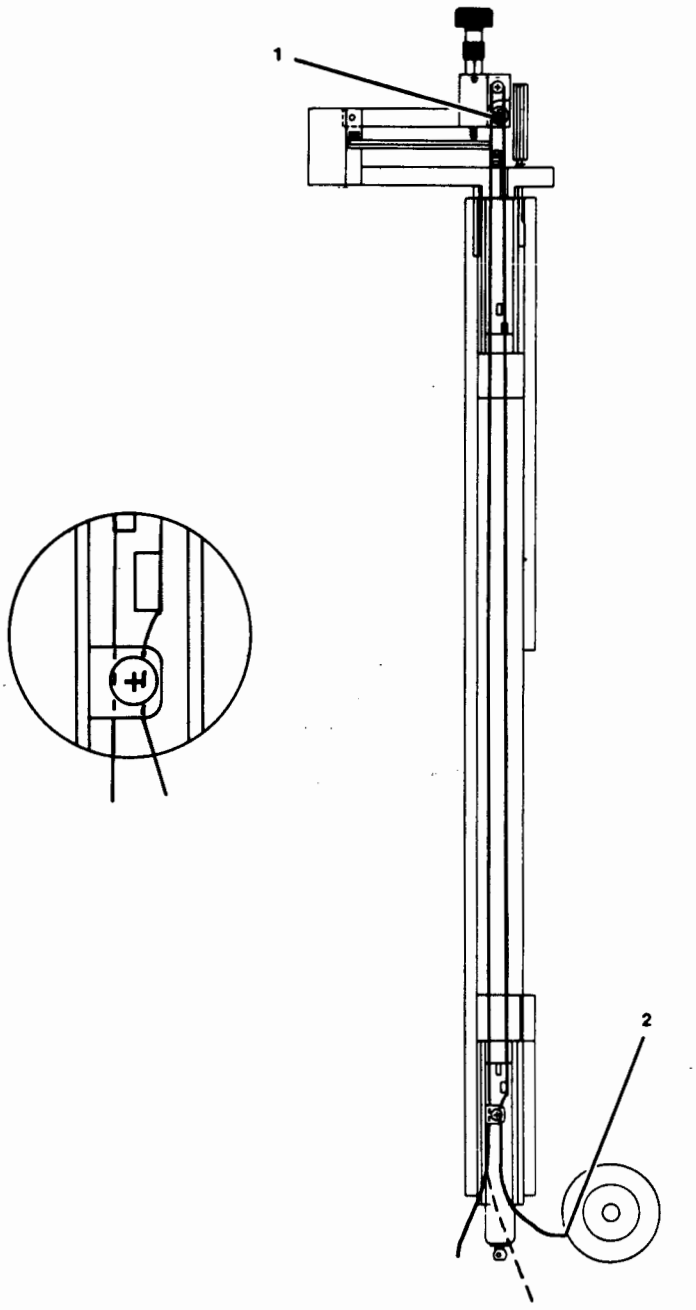
D. Remove the two end caps by sliding the end caps outward off the corona assembly end blocks.

E. Loosen the one cross-hatched screw (see Figure 4-28) at the end ball connector end of the corona assembly.

F. Remove the one cross-hatched screw and D-shaped washer at the handle end of the corona assembly. Remove all wire fragments.

G. Install the Corona Stringing Tool (part number 02682-60451) to the endblock (opposite the ball connector) as shown in Figure 29. The tool should be firmly positioned against the endblock with the tool's pulley facing up. Ensure that the Tension Adjust Knob is loosened before installing the tool.

H. Begin stringing the wire by positioning the new corona wire under the top edge of the D-shaped washer at the connector end of the assembly; tighten the cross-hatched screw slightly to hold the wire in place.



1. Pulley
2. Corona wire spool

Figure 4-29. Transfer Corona Assembly (Stringing Wires).

I. Thread the wire around the stringing tool's pulley and back towards the lower edge of the D-shaped washer (see Figure 4-29). Position the corona wire spool to the left of the end ball connector as shown in Figure 4-29.

NOTE

In stringing the corona wire, always keep the corona wire spool horizontal and rotate the spool to feed the wire off the spool. This prevents the wire from kinking and knotting.

J. Hold the beginning end of the corona wire in one hand while loosening the cross-hatched screw. Slide the corona wire spool forward (see Figure 4-29) positioning the corona wire under the lower edge of the D shaped washer; securely tighten the cross-hatched screw.

NOTE

Ensure that the corona wire is to the outside of the rectangular protrusions on the end blocks.

K. Rotate the stringing tool's Tension Adjust Knob clockwise until the tension springboard is aligned to the tension mark, see Figure 4-29.

L. Install the D-shaped washer and the cross-hatched screw at endblock B; securely tighten the screw.

M. Rotate the Tension Adjust Knob counter-clockwise to loosen the corona stringing tool and remove the tool.

N. Break off the leading end, trailing end and handle loop corona wires; ensure that no short ends remain.

O. Inspect the newly strung corona wire and clean if necessary.

P. Re-install the two corona end caps removed in step D.

Q. Re-install the two corona shields. Ensure that the shields are firmly positioned against the end blocks. Ensure that the flanged portion of the inside corona shield faces towards the cutout flange of the corona assembly.

CAUTION

To avoid possible damage to the drum surface, ensure that the corona assemblies are properly aligned in their guide rails before re-installing.

R. Re-install the transfer corona handle and re-install the assembly in the printer. Ensure that the handle is installed so the two holes above the two screws which secure the handle to the assembly are cleared.

4-9. DATA PROCESSOR PCA ADJUSTMENT

The Data Processor PCA (HP part number 02682-60001) may be configured to operate with or without graphics printing capabilities. Changing the mode of operation

from non-graphics to graphics is implemented by replacing PROMs U56 and U66 on the Data Processor PCA and by replacing the DCS I/O PCA.

The mixing of graphic and non-graphic PCAs and components results in printer failure. The following is a listing of Data Processor PCA graphic and non-graphic PROM part numbers; verify that the printer is configured correctly for it's mode of operation.

Non-Graphic PROMs	U56 (HP part number 02682-60219) U66 (HP part number 02682-60220)
Graphic PROMs	U56 (HP part number 02682-60522) U66 (HP part number 02682-60521)

NOTE

See section 4-30 (Input/Output PCA Adjustment) for determining if the correct I/O PCA is installed for the desired mode of printer operation.

4-10. DC POWER SUPPLIES ADJUSTMENT

Normally, the two power supply assemblies do not have to be adjusted unless new power supplies are installed in the printer. If adjustment is necessary, proceed as follows:

EQUIPMENT NEEDED

- HP 3435A Digital Voltmeter (DVM), or equivalent four-digit DVM.

A. Set the rear MAIN POWER breaker to OFF.

B. Remove the printer rear panel.

C. Remove the plastic shield from the power supplies by pulling upward until the shield is free of the standoffs.

D. Connect the DVM to the test point(s) which corresponds to the voltage to be adjusted:

+/- 12VDC (TP 16) Control PCA (+12 measured)
+ 5VDC (TP 22) Control PCA
+ 28VDC (TP 6) Power Distribution PCA

Use TP 2 or 3 on the Power Distribution PCA as GND

E. Set the rear MAIN POWER breaker to ON.

WARNING

High voltages are present when power is applied to the printer. Extreme care must be taken when making the voltage adjustments. Do not disturb power supply wiring.

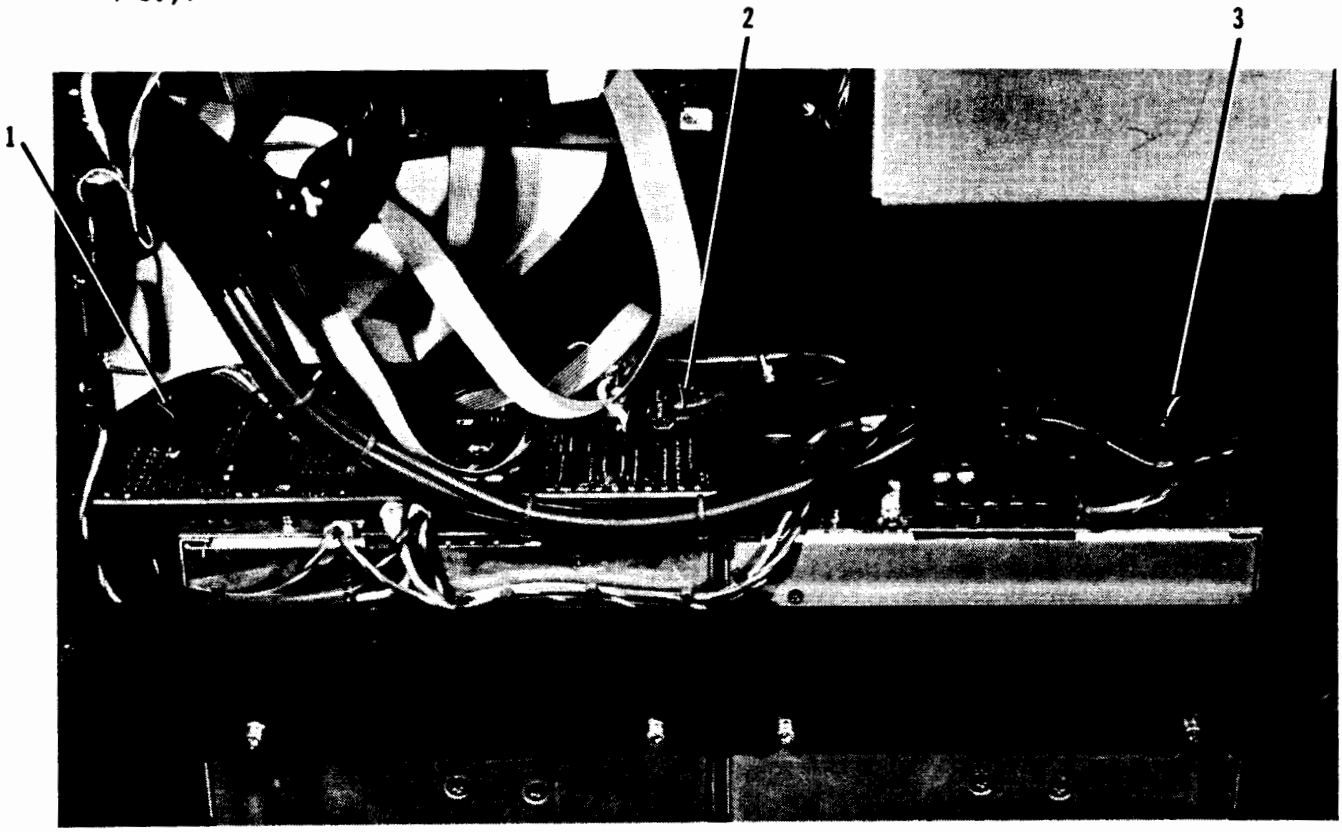
F. Tne voltage adjustment potentiometers are shown in Figure 30. Adjust each potentiometer to within the following tolerances:

+ 12 VDC (+/- .01 VDC)
+ 5 VDC (+/- .01 VDC)
+ 28 VDC (+/- .05 VDC)

NOTE

The -12VDC source does not have an adjustment potentiometer; its voltage level tracks that of +12 VDC source. Adjust the + 12 VDC potentiometer to within its tolerance and measure TP 14 on the Control PCA to verify that it is 12 VDC +/- .02 VDC.

G. Adjust all the CURRENT LIMIT potentiometers fully clockwise (three on the +/- 12 VDC and + 5VDC supply and one on the + 28 VDC supply, see Figure 4-30).



1. +/-12 V potentiometer
2. +5 V potentiometer
3. +28 V potentiometer

Figure 4-30. DC Power Supplies.

H. Set the rear MAIN POWER breaker to OFF and re-install the power supply plastic shield and printer rear panel.

I. Set the rear MAIN POWER breaker to ON and resume normal operation.

4-11. DC POWER SUPPLIES REMOVAL

+/-12 and +5 VDC POWER SUPPLY

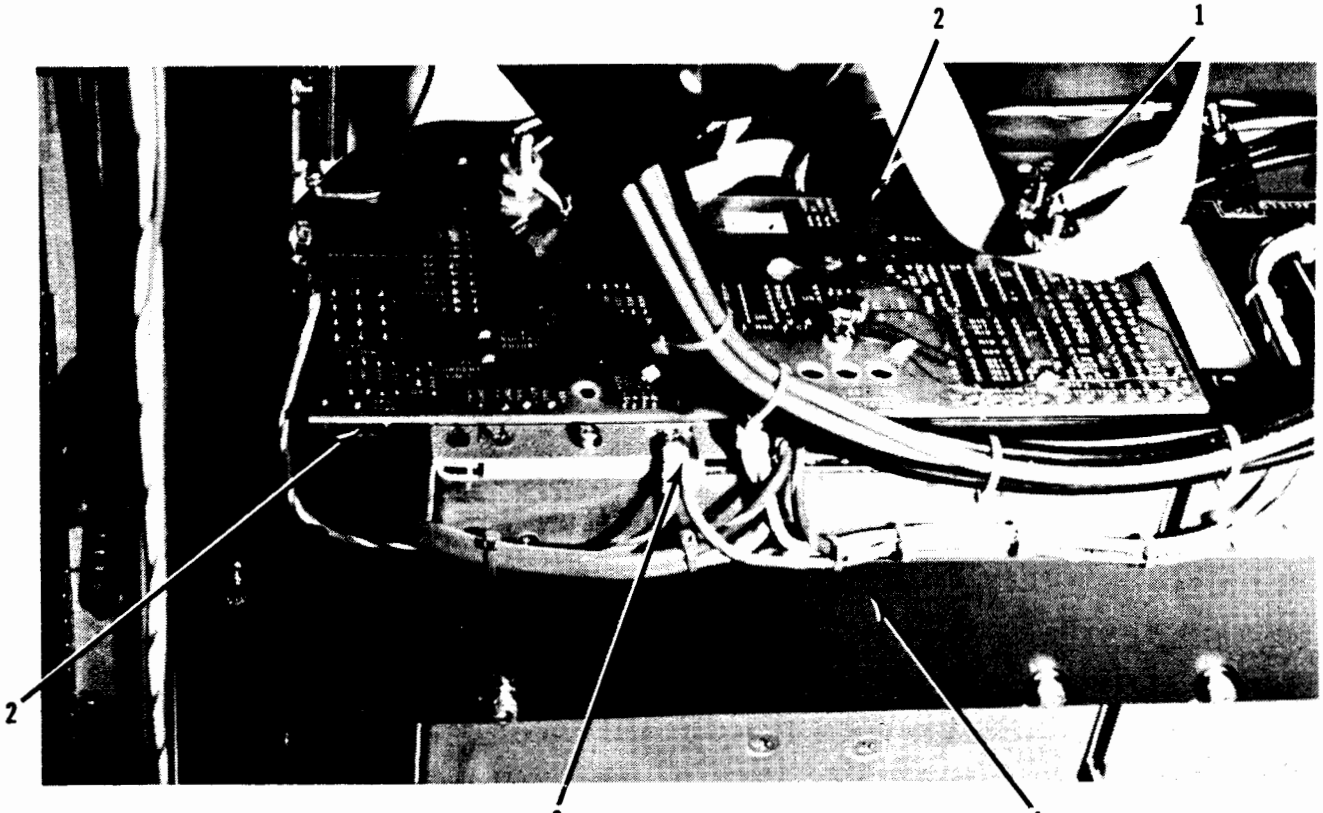
To remove the +/- 12VDC and + 5VDC Power Supply Assembly, proceed as follows:

A. Set the rear MAIN POWER breaker to OFF.

B. Remove the printer rear panel.

C. Remove the plastic shield from the power supply assembly.

D. Disconnect the two large wires (+ Brown and - Black) at the right side of the DC Power Distribution PCA (see Figure 31) and remove the locknuts located below these wires.



1. Disconnect 2 wires
2. Disconnect 2 connectors
3. Disconnect 3 wires
4. Top mounting bar

Figure 4-31. Power Distribution PCA and DC Power Supply.

E. Carefully lift the DC Power Distribution PCA upward until it is free of the edge connectors on both sides.

F. Pull the PCA outward and disconnect the two remaining connectors. The DC Power Distribution PCA will have to be mounted on the new DC Power Supply Assembly unless both are to be replaced.

G. Note the positions of the wires on the terminal block, then disconnect all the wires:

orange/white	-	AC
violet/white	-	Neutral
green/yellow	-	GND

H. Remove the top mounting bar which holds the power supply assembly

I. Loosen the two left-hand screws on the lower mounting bar.

J. Lift the assembly out of the printer.

CAUTION

The new power supply assembly MUST be strapped for 240 volt operation before power is applied. The metal jumper strap must be installed between terminals E2 and E3 on the top of the assembly. Some assemblies are shipped with the strap between terminals E1 and E2.

NOTE

The Power Supply Assemblies Adjustment MUST be performed whenever a new power supply is installed. Refer to section 4-10 of this manual.

Reverse the procedure listed above to install the +/- 12 and +5 VDC Power Supply.

+28 VDC Power Supply

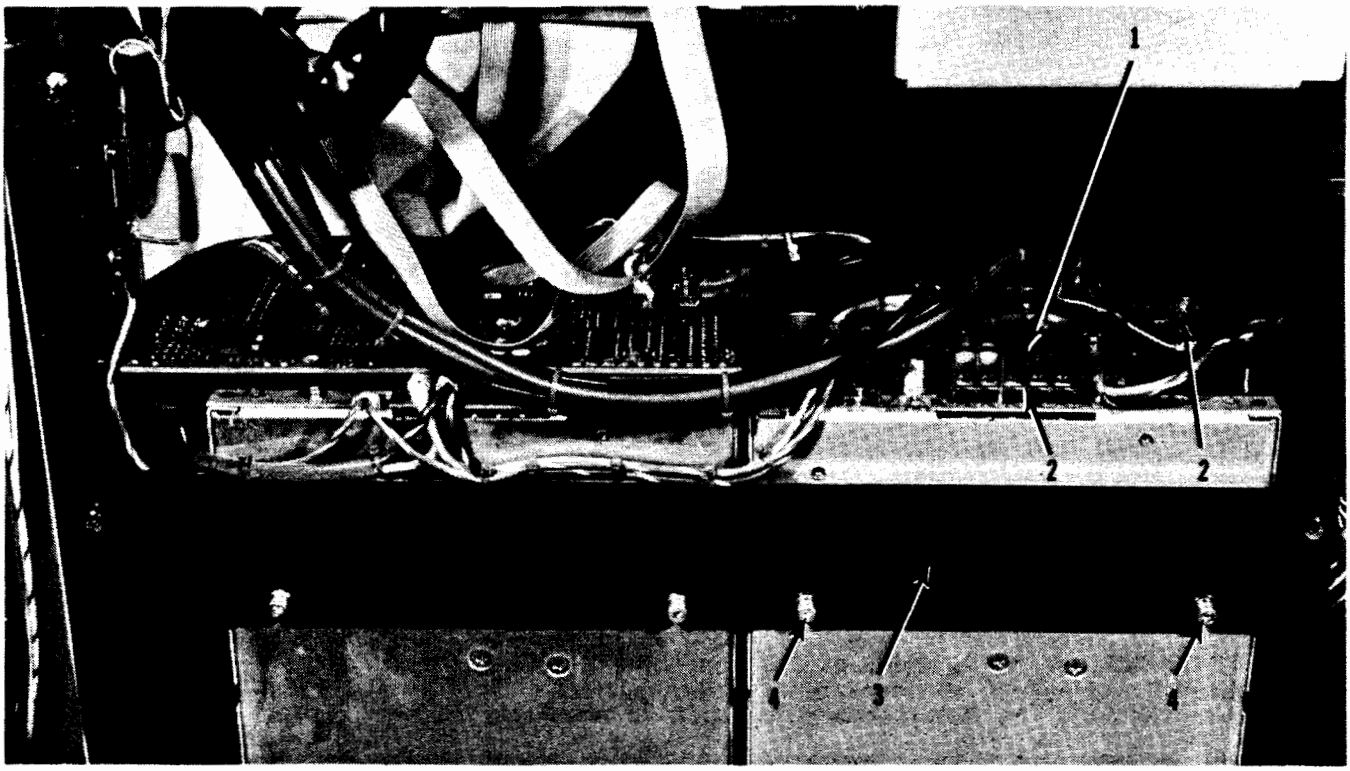
To remove the +28V DC Power Supply, proceed as follows:

A. Set the rear MAIN POWER breaker to OFF.

B. Remove the printer rear panel.

C. Remove the plastic shield from the power supply assemblies.

D. Remove the plastic shield from the center of the assembly (see Figure 4-32).



1. Plastic shield
2. Terminal blocks-disconnect all wires
3. Top mounting bar
4. Loosen 2 screws

Figure 4-32. 28 VDC Power Supply.

E. Note the position of the wires, then disconnect all wires from the two terminal blocks:

orange/white	-	AC
violet/white	-	Neutral
orange/white	-	E4
green/yellow	-	GND
black	-	-V1
red	-	+V1

F. Remove the top mounting bar which holds the power supply assembly in the printer.

G. Loosen the two top right-hand screws on the lower mounting bar (see Figure 4-32).

H. Lift the assembly out of the printer.

CAUTION

The new power supply assembly MUST be strapped for 240 volt operation before power is applied. The metal jumper strap must be installed between terminals E2 and E3 on the top of the assembly. Some assemblies are shipped with the strap between terminals E1 and E2.

NOTE

The Power Supply Assemblies Adjustment MUST be performed whenever a new power supply is installed. Refer to section 4-10 of this manual.

Reverse the procedure listed above to install the power supply assembly.

4-12. DENSITOMETER PCA ADJUSTMENT

The Monitor PCA density offset and the Densitometer PCA gain must be adjusted for variations in the printer's internal environment. These variations may include differences between drums (if the drum is changed), installation of a new Monitor PCA, or replacement of the Densitometer PCA. The density offset must be adjusted before the densitometer gain is set. To adjust the Monitor PCA density offset and the Densitometer PCA gain, proceed as follows:

EQUIPMENT NEEDED

- Digital Voltmeter (DVM)

Densitometer Offset Adjustment

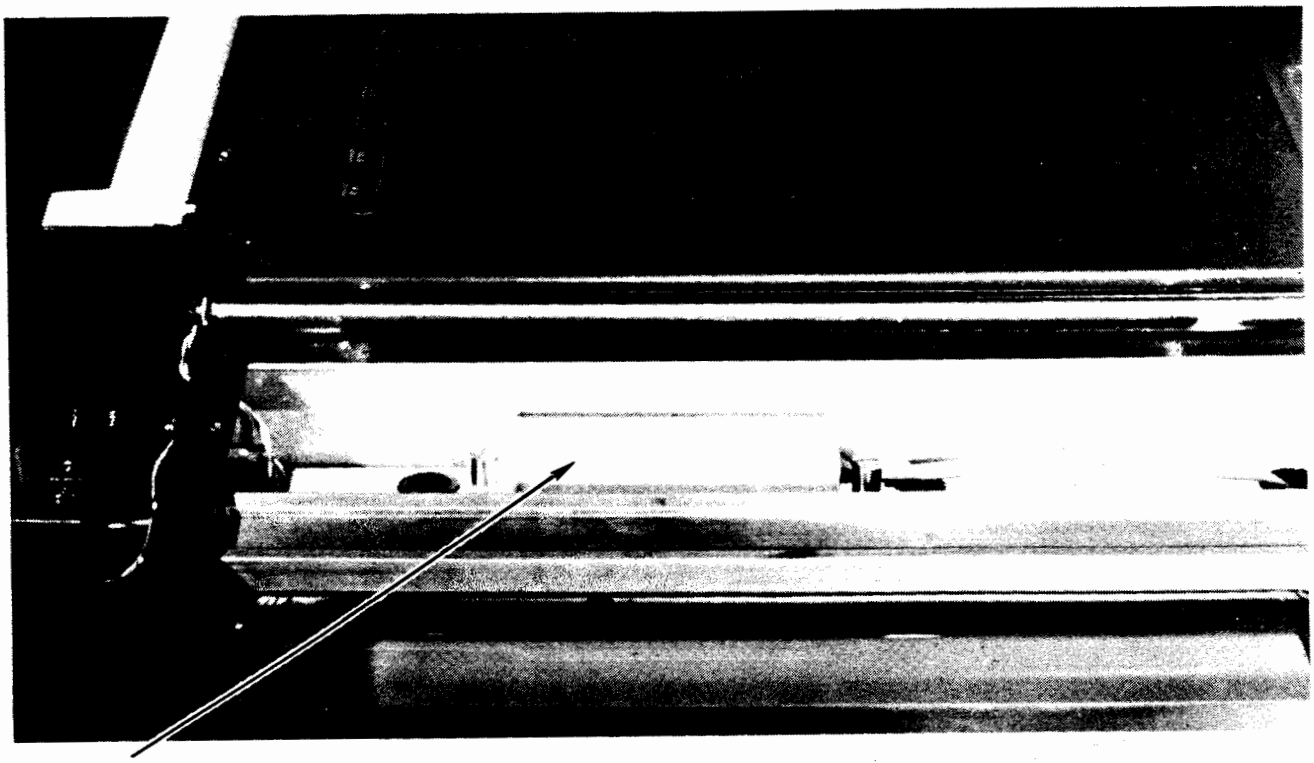
A. Open the printer top cover.

B. Key in 632, ENTER (to access CE mode); 676, ENTER (to allow printer operation with the front door open) and 644, ENTER to set the densitometer to high gain.

C. Remove the electrophotographic (EP) interior closeout panel. This panel is located to the right of the review window.

D. Remove the photoconductive drum per MP 3, chapter V. At the conclusion of step D the following items should be removed from the printer:
   - Developer Assembly
   - Electrostatic Monitor
   - Corona Assemblies (3)
   - Cleaner Station
   - Drum End Plate
   - Photoconductive Drum

E. Remove the densitometer cover (see Figure 4-33).

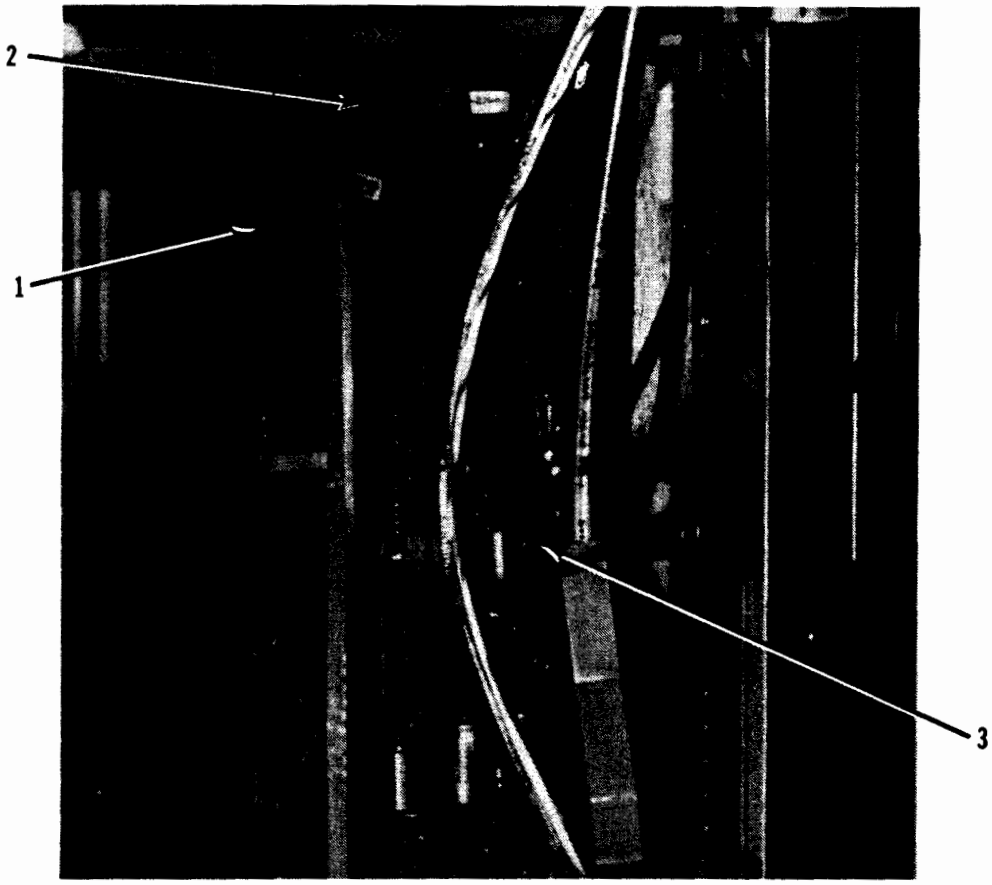


1. Cover

Figure 4-33. Densitometer Cover.

F. Remove the printer rear panel.

G. Connect the DVM to the "DM0" and "GND" test points on the Monitor PCA (see Figure 4-34).



1. DMO test point (TP 1)
2. Offset density potentiometer
3. ESM gain potentiometer

Figure 4-34. Monitor PCA (Densitometer Offset Adjustment).

H. The voltage measured at test point "DMO" should equal 0.00 +/- .02 VDC. If DMO is within these limits, no further adjustment is needed. If DMO is outside the limits, adjust the OFFSET DENS potentiometer until the density offset is within range.

I. When the adjustment is completed, disconnect the DVM and proceed on to the Densitometer Gain Adjustment procedure.

J. Reinstall the drum per MP-4, Chapter V.

Densitometer Gain Adjustment

NOTE

Ensure that the printer front door is closed.

A. Press 631, ENTER, 2680, ENTER at the Service Control Panel to enter the service command mode.

B. Press 326, ENTER at the Service Control Panel. The "Clean drum interval=?" message will be displayed. Press 1, ENTER to set the new interval to one.

C. Press 1, ENTER, RUN to initiate the printer Self Test.

D. Press 1225, ENTER to continuously display the clean drum measurement.

E. Adjust the potentiometer on the Densitometer PCA for an indication on the display of 675 counts +/- 10 counts.

NOTE

If the range specified cannot be attained, halt the printer (press HALT). Remove the densitometer assembly and inspect the assembly for obstructions in the cone. If none are found, replace the densitometer assembly.

F. After the adjustment is complete, press HALT.

G. To restore the clean drum interval, press 326, ENTER at the Service Control Panel. When the "Clean drum interval=?" message is displayed, press 500, ENTER to restore the interval to a count of five hundred thousand drum rotations.

H. Re-install the Densitometer cover, EP closeout panel, and close the printer top cover.

I. Press 630, ENTER to restore the printer to the normal mode of operation.

4-13. DEVELOPER BIAS ADJUSTMENT

The developer bias voltage represents the voltage applied to the developer mixture. This voltage must be 302 volts +/- 5 volts at TP12 on the High Voltage Supply PCA and at the developer housing. If the voltage is not within this range the developer bias must be adjusted **IF THE DATE CODE (of the high voltage power supply) IS LESS THAN 2535.** No adjustment is necessary on PCA's with a date code of 2535 or greater. To verify the developer bias, proceed as follows:

Equipment Needed

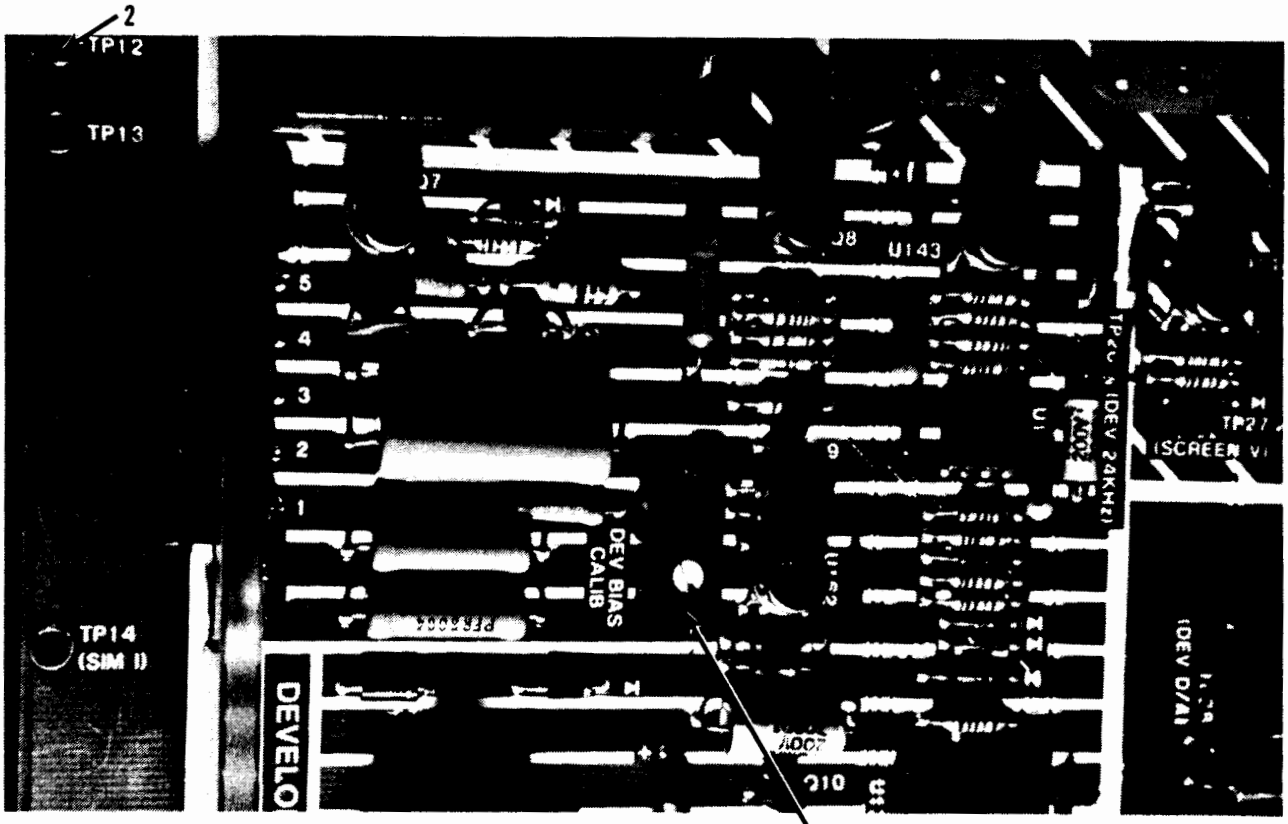
- DC Voltmeter , 10 Mega Ohm input impedance

Developer Bias Verification

A. Remove the printer rear panel.

B. With the printer ON, enter the service command mode by pressing 631, ENTER, 2680, ENTER.

C. Connect a voltmeter to test point TP12 on the High Voltage PCA and to ground (see Figure 4-35). Adjust the voltmeter to read between 200 to 400 volts.



1. DEV BIAS CALIB potentiometer
2. Test point (TP12)

Figure 4-35. High Voltage Supply PCA.

D. Press 736, ENTER, RUN (Developer Bias Enable) at the Service Control Panel and observe the voltage measured. If the voltage is within range, proceed to step E and verify the voltage at the developer housing. If the voltage is not within range, proceed to the adjustment procedure.

E. The developer bias is measured at the developer housing to ensure that all connectors and cables between the High Voltage PCA and the developer assembly are in good condition (none frayed, corroded, or broken). Measure the developer bias as follows:

1. Press 600, ENTER to exit the Developer Bias Enable routine.

2. From the service command mode, press 676, ENTER (Enables High Voltage System) and open the printer front door. Note, the printer door must be opened within three seconds.

3. Connect a voltmeter to the developer housing and to ground.

4. Press 736, ENTER, RUN (Developer Bias Enable) and observe the voltage measured. If the voltage is not similar to the measured voltage at TP12, place the rear MAIN POWER breaker to OFF and inspect all connectors and cables within the developer bias circuitry system.

Developer Bias Adjustment

NOTE

Normally the DEV BIAS CALIB potentiometer is preset and Glyptolled at the factory and requires no adjustment.

A. Adjustment of the Developer Bias requires the removal of the High Voltage PCA. To adjust the Bias proceed as follows:

1. Set the Rear MAIN POWER breaker to OFF and remove the High Voltage Supply PCA.

2. Locate the DEV BIAS CALIB potenitometer (see Figure 4-35) and make the necessary adjustment:

- To increase the bias rotate the potentiometer counter-clockwise
- To decrease the bias rotate the potentiometer clockwise.

3. Install the PCA in the printer and repeat the verification procedure. Repeat the adjustment procedure until the developer bias is within range.

4-14. DEVELOPER ROLL REPLACEMENT and MAGNET ANGLE ALIGNMENT

Developer Roll Removal

A. Remove and purge the developer assembly as described in MP 1, Chapter V.

B. Remove the developer roll from the assembly as follows:

1. Insert a flat-blade screwdriver into the developer drive gears to keep the gears from turning when the developer roll is being removed (see Figure 4-37).

2. Rotate the developer roll clockwise (as viewed from the gear train) approximately eight turns until the developer roll is free; allow the roller to fall into the developer cavity.

3. Remove the roll support bracket (Figure 4-36).

4. Remove the flat-blade screwdriver.

5. Remove the developer roll from the developer cavity and scrape as much developer mixture as possible from the roll surface.

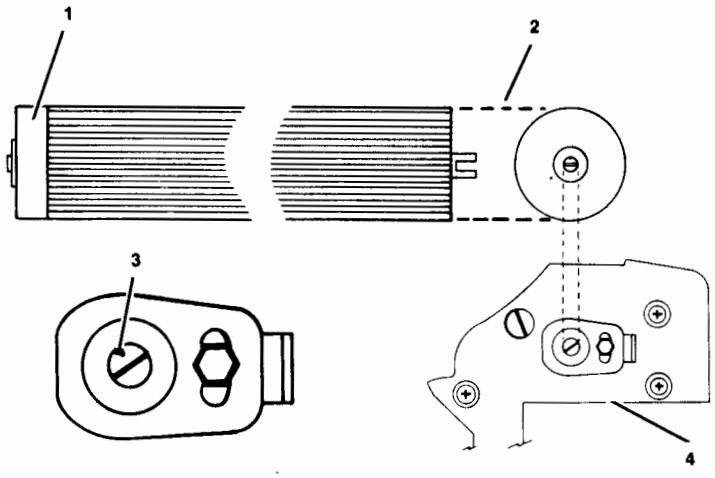
Developer Roll Installation

A. Insert the clean developer roll in the developer assembly as follows:

1. Insert the non-capped end of the developer roll into the developer cavity first (see Figure 4-36). The capped end of the developer roll should be nearest the gear train.

2. Rotate the developer roll until the notch at the end of the non-capped end of the roll faces up (see insert in Figure 4-36).

3. Insert the roll support bracket on the developer roll shaft.

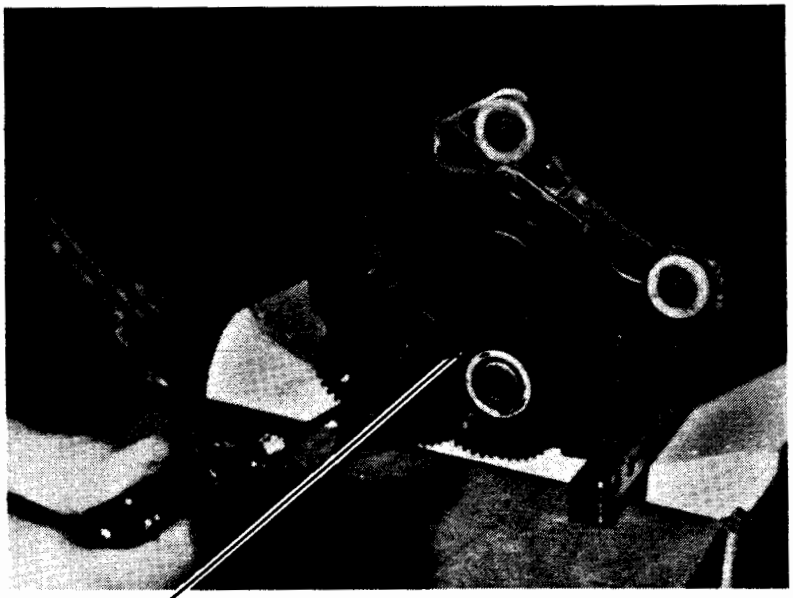


1. Capped end
2. Non-capped end
3. Notch
4. Roller support bracket

Figure 4-36. Installing the Developer Roller.

4. At the capped end of the developer roll, align the roll with the developer drive screw; rotate the roller counter-clockwise (as viewed from the gear train) several times until snug (until the gears begin to turn).

5. Install the flat-blade screwdriver in the developer drive gears (see Figure 4-37) and rotate the developer roll counter-clockwise until the roll is firmly tightened on the developer drive screw. Remove the screwdriver.



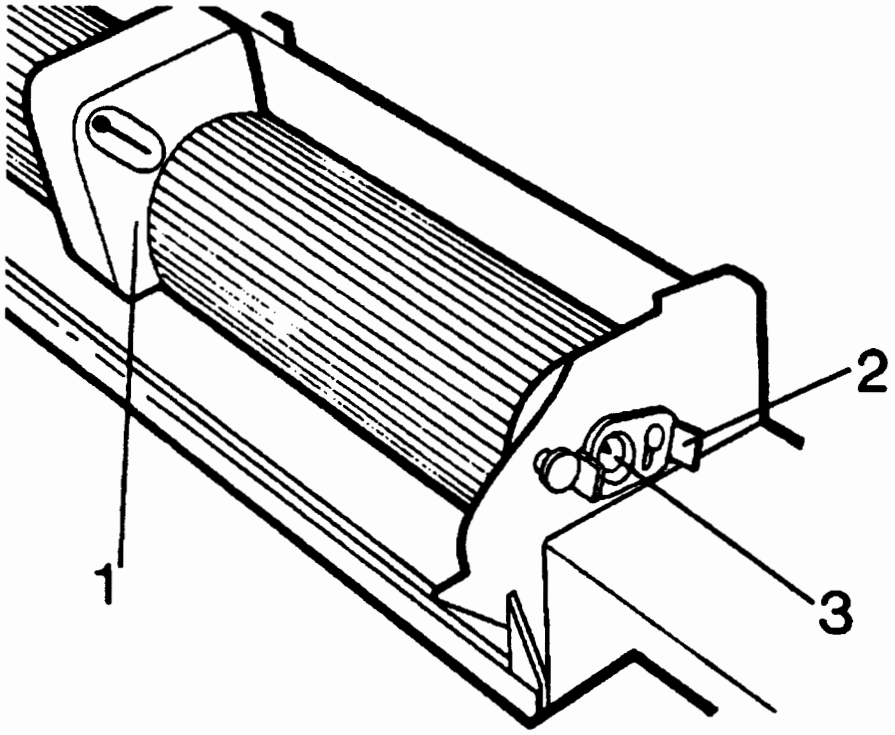
1. Jam gears here

Figure 4-37. Locking the Developer Gears.

6. Ensure that the roll support bracket is firmly seated to the developer housing and install the bracket locking hexhead screw and washer. Do not tighten the screw.

Magnet Angle Alignment

A. Position the Magnet Angle Alignment tool (part number 02682-60606) near the center of the developer roll, see Figure 4-38. The window on the alignment tool faces towards the roll support bracket.



1. Verify the magnet angle
2. Magnet angle support bracket
3. Magnet roll polarity notch

Figure 4-38. Installing the Developer Roller.

B. Align the developer roll magnet angle as follows:

1. Moving the roll support bracket deflects the alignment tool's indicator needle. Move the support bracket until the needle is EXACTLY aligned to the centering mark on the tool.

2. Carefully tighten the roll support bracket screw; ensure that the magnet angle does not change.

3. Recheck the angle alignment and re-align if necessary.

4. Remove the alignment tool when the alignment is complete.

C. Replenish the developer mixture, install the developer assembly and perform the run-in routine as described in MP 2, chapter V.

4-15. DEVELOPER TOP SEAL ROLLER and END SEAL REPLACEMENT

The developer top seal rollers and the developer end seals should be replaced as needed to prevent a possible developer/drum electrical short. Replacement of

the top seal support spring is required whenever the spring lacks sufficient resilience to hold the top seal against the drum. To replace the developer top seal rollers, end seals, or support spring, proceed as follows:

A. Remove the developer assembly and place the assembly on a clean working surface (refer to MP 1-Developer Assembly Removal and Purge procedure in Chapter V.

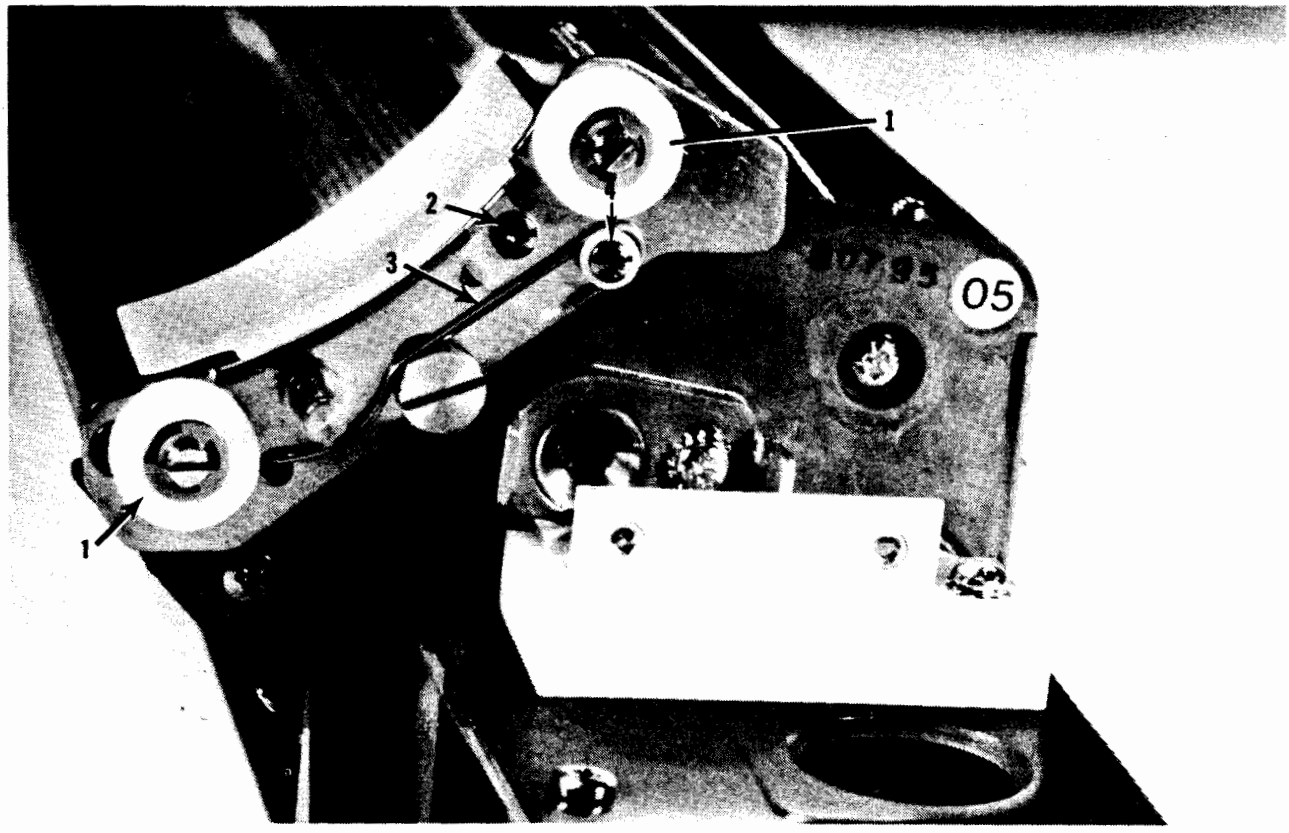
B. Lift up on the developer seal and remove the seal from the developer assembly.

C. All four developer seal rollers need to be replaced; each roller is secured to the seal assembly by an "E" ring. Remove the "E" rings and replace all four rollers.

CAUTION

There are nylon washers located behind the rollers that could become lost when the rollers are removed. Take care not to misplace them.

D. Each of the two mylar end seals is secured by one cross-hatched screw (see Figure 4-39). Remove the cross-hatched screws and replace the mylar end seals.



1. E rings
2. Remove end seal screws
3. Top Seal support spring
4. Top seal support spring screw

Figure 4-39. Developer Top Seal Roller and End Seals.

E. Each of the two top seal support springs is secured by one cross-hatched screw (see Figure 4-39). Remove the screws to replace the springs.

F. Re-install the developer seal on the developer assembly and re-install the assembly in the printer (refer to MP 2, Chapter V.)

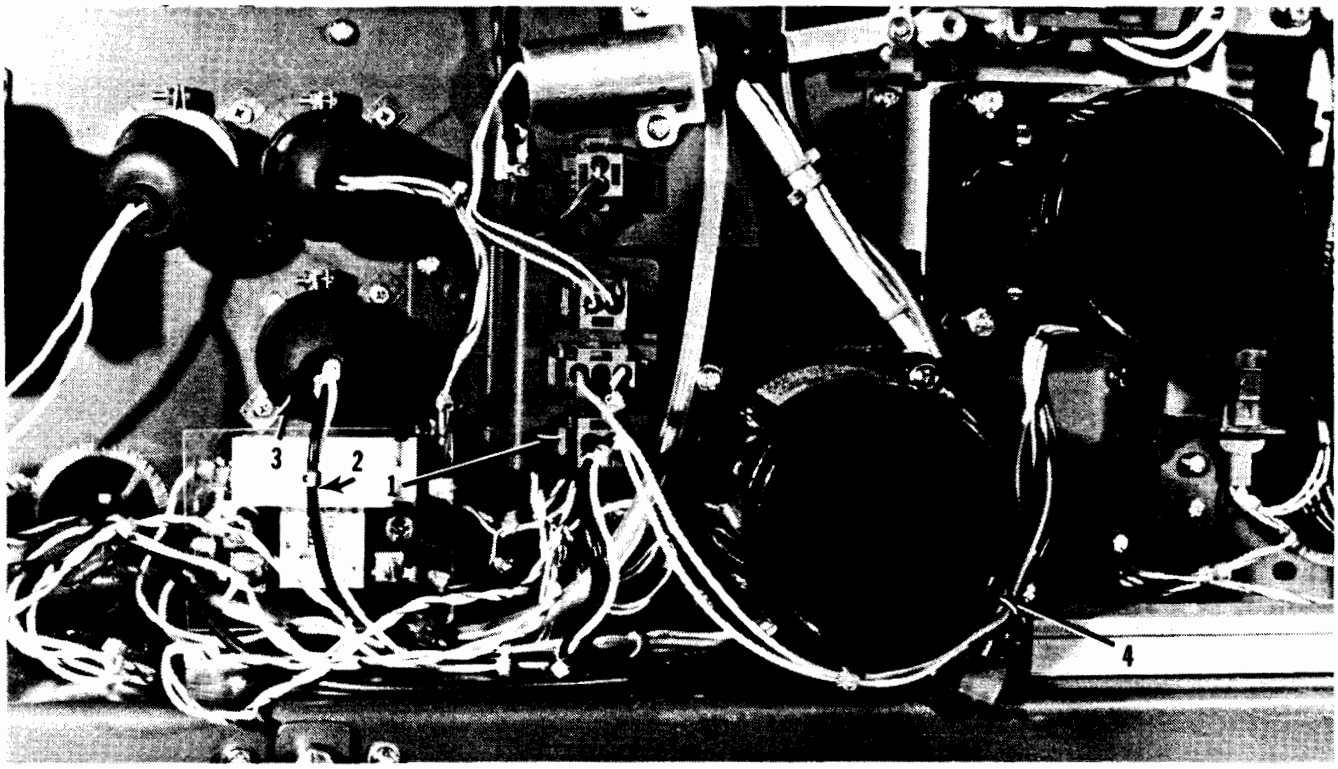
4-16. DEVELOPER DRIVE MOTOR ASSEMBLY REPLACEMENT

To remove the developer drive motor assembly, proceed as follows:

A. Set the rear MAIN POWER breaker to OFF.

B. Remove the printer rear panel.

C. Disconnect the bottom connector on the connector bracket located to the left of the developer drive motor (see Figure 4-40).



1. Developer motor connector
2. Disconnect 2 wires under this shield
3. Developer motor capacitor
4. Developer drive motor

Figure 4-40. Developer Drive Motor.

D. Remove the shield from the high voltage solid state relay. Note the positions of the wires on the relay, then disconnect the two wires on the left side of the relay (pins 1 and 2).

E. Pull the rubber cap off the bottom of the developer capacitor. Note the positions of the wires on the capacitor, then pull the two wires loose from the capacitor leads.

F. Remove the developer motor ground strap and the four bolts which secure the developer motor mounting plate and motor to the frame. The motor assembly can now be removed from the printer.

To install the developer drive motor assembly, reverse steps A through F. Ensure that the ground strap at the upper right corner of the motor is securely installed.

4-17. DISPLAY PCA ADJUSTMENT

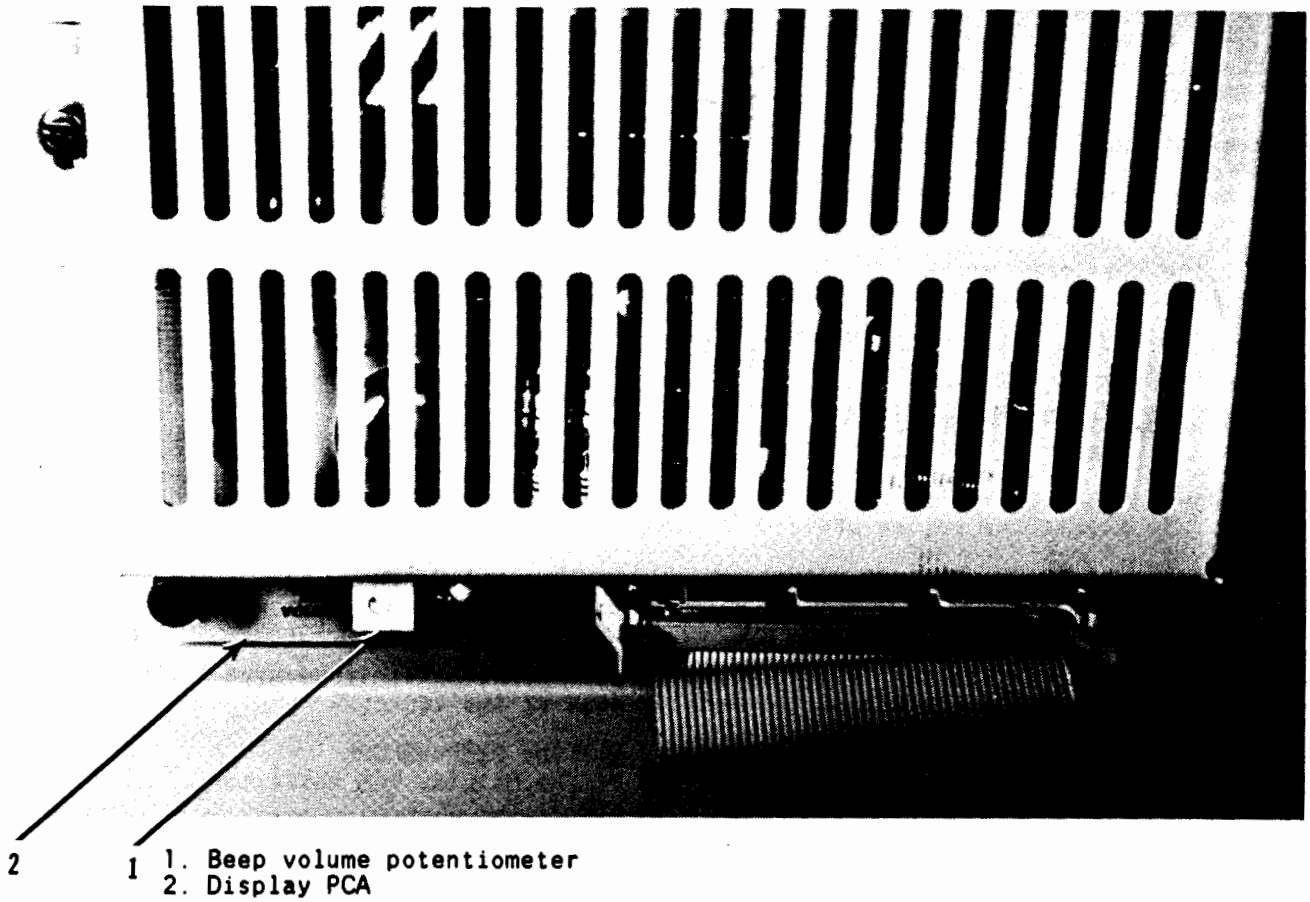
The only adjustment required on the Display PCA is the speaker volume adjustment. To adjust the volume proceed as follows:

A. The printer mst be ON, but not operating.

B. Lift the top cover fully open.

C. Remove the top cover closeout panel (dress cover). This panel is secured to the top cover by fasteners around the outside edge of the top cover.

D. Alternately press the STACK MANUAL key and adjust the BEEP VOLUME potentiometer (see Figure 4-41) at the bottom of the Display PCA until the desired volume of tone is achieved.



1. Beep volume potentiometer
2. Display PCA

Figure 4-41. Display PCA (Top Cover Dress Panel Removed).

4-18. DRUM BEARING and GEAR REPLACEMENT

To replace the drum bearings and/or drum gear, proceed as follows:

A. Set the rear MAIN POWER breaker to OFF.

WARNING

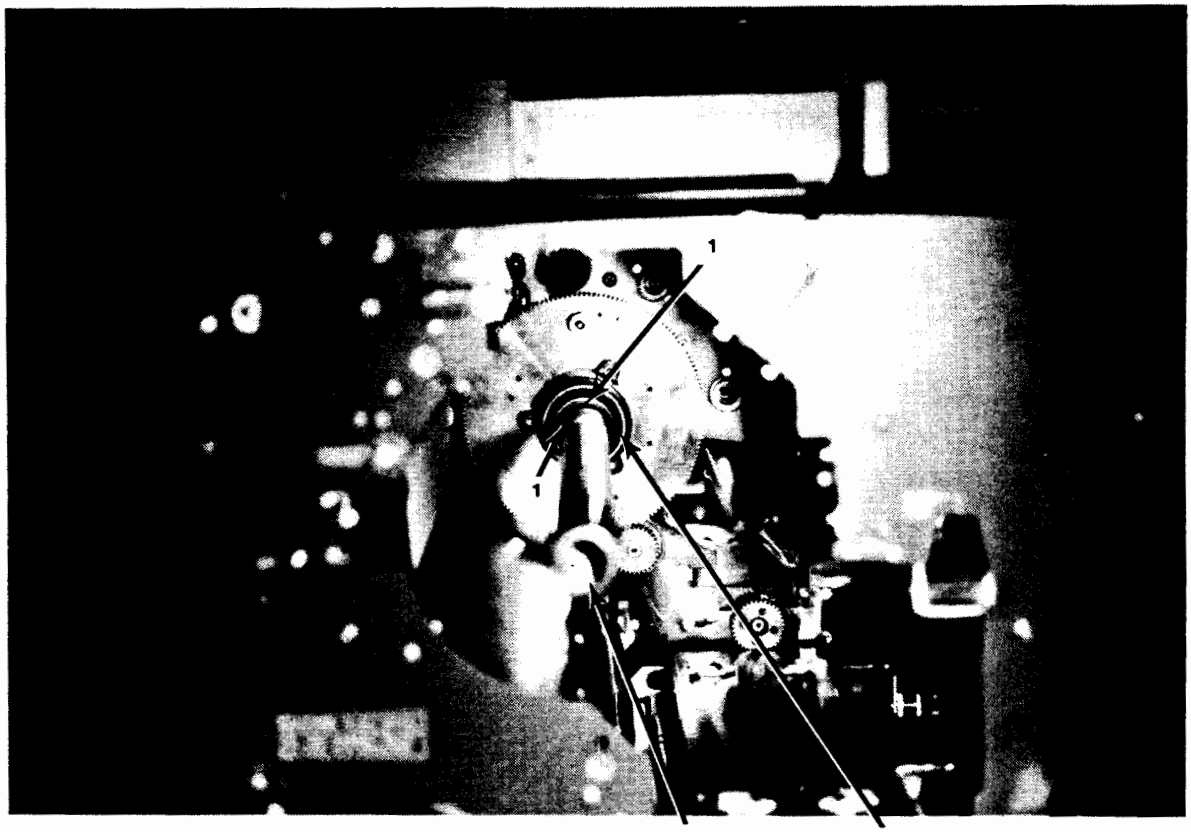
The drum is hot and should be allowed to cool for 30 minutes before attempting to touch the drum. Serious burns could result.

NOTE

The bearing at the outer end of the drum should also be replaced when replacing the inner end bearings.

B. Remove the photoconductive drum as described in MP 3-Photoconductive Drum Removal, in Chapter V of this manual.

C. Loosen the two set screws which secure the collar to the drum shaft (see Figure 4-42).



1. Set screws
2. Collar
3. Drum shaft

Figure 4-42. Drum Shaft (Inner Bearing and Collar).

D. Grasp the drum gear and slide the collar, bearings, bearing holder, and gear off the shaft.

E. Reverse this procedure to install the bearings and gear. The order in which the items should be installed on the shaft are: the spacer, bearing, gear (with bearing holder outward), bearing, and collar.

F. Reinstall the drum as per MP 4, Chapter V.

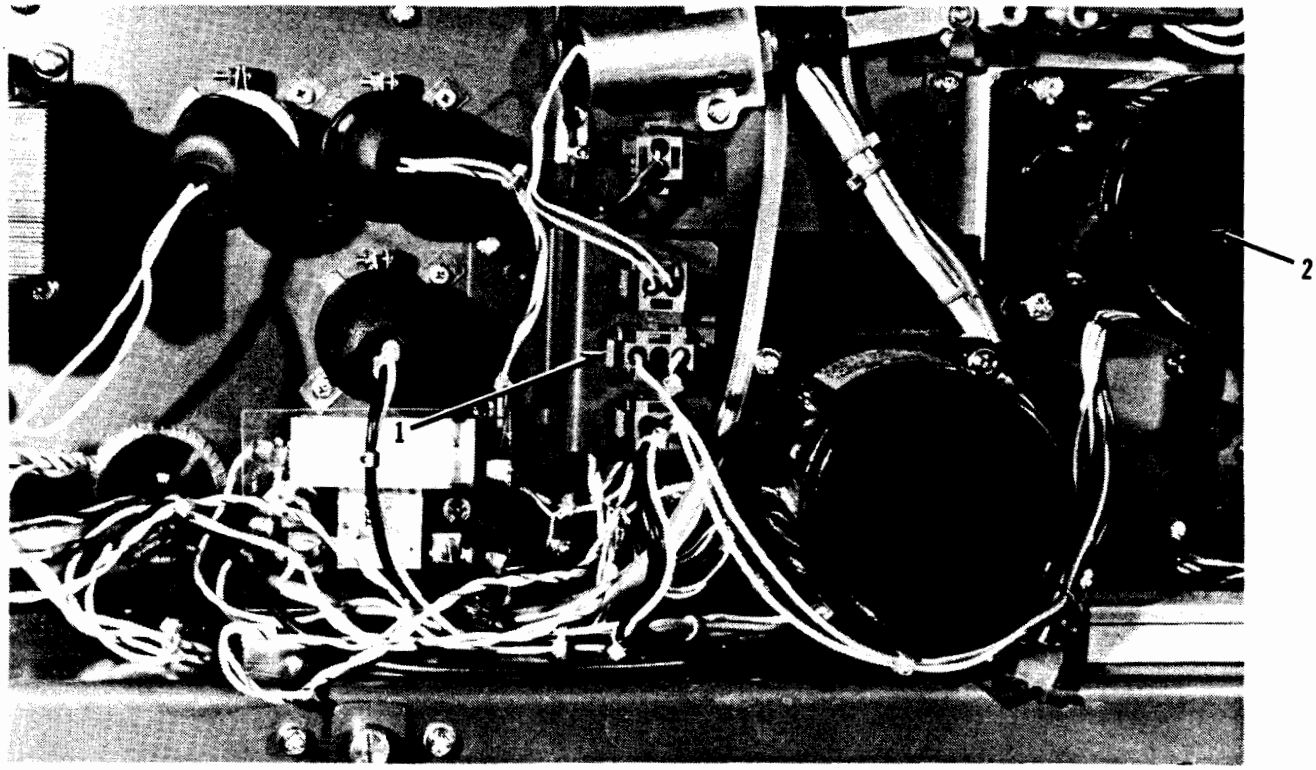
4-19. DRUM DRIVE GEAR, GEAR BOX and DRUM DRIVE MOTOR REPLACEMENT

This procedure describes removal of the drum drive motor, the developer and the drum gear boxes, and the drive gears. To remove any of these items, proceed as follows:

A. Set the rear MAIN POWER breaker to OFF.

B. Remove the printer rear panel.

C. To remove the drum drive motor, disconnect the middle connector on the connector bracket located to the left of the developer drive motor (see Figure 4-43).



1. Drum drive connector
2. Drum drive motor

Figure 4-43. Drum Drive Motor.

D. Remove the four mounting bolts from the motor. If the drum drive motor is being removed, it can be removed from the printer; if the developer drive motor is being removed, rest it on the frame just below the motor.

E. The motor and the gear box can now be separated from each other. If replacement of the drive gear is required, continue to step F.

F. Tap the roll pin out of the gear box shaft and slide the drive gear off the shaft.

NOTE

Ensure that the ground strap is installed on the motor when replacing these assemblies.

Installation of the drive gear and gear box is the reverse of the procedure listed above.

NOTE

Add a light film of Moly-Cote G lubricant to the gears to prevent wear.

4-20. ELEVATOR ASSEMBLY REPLACEMENT

To remove the elevator assembly, proceed as follows:

A. If the printer is not off-line, press the HALT key.

B. Remove paper from the elevator tray.

C. Press the STACK UP or STACK DOWN switch on the paper control panel to position the elevator tray approximately one third up from the bottom position.

D. Push in and rotate the PAPER LENGTH ADJUST knob fully clockwise.

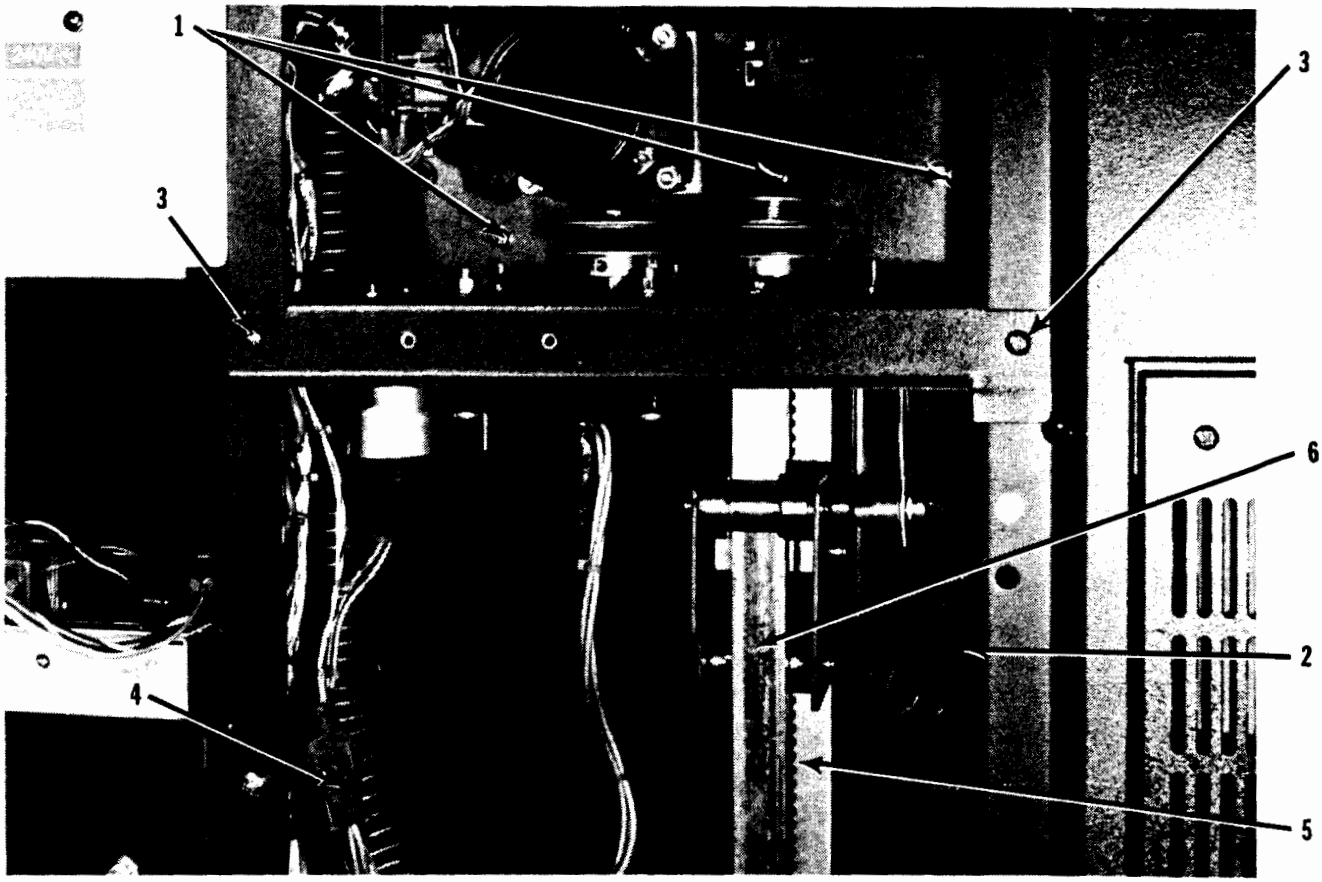
E. Open the PAMM door.

F. Set the rear MAIN POWER breaker to OFF.

G. Remove the printer rear panel.

H. Remove the metal guard from the area around the leadscrew drive pulleys (see Figure 4-6).

I. Remove the three screws which secure the elevator front panels and remove these panels (see Figure 4-44).



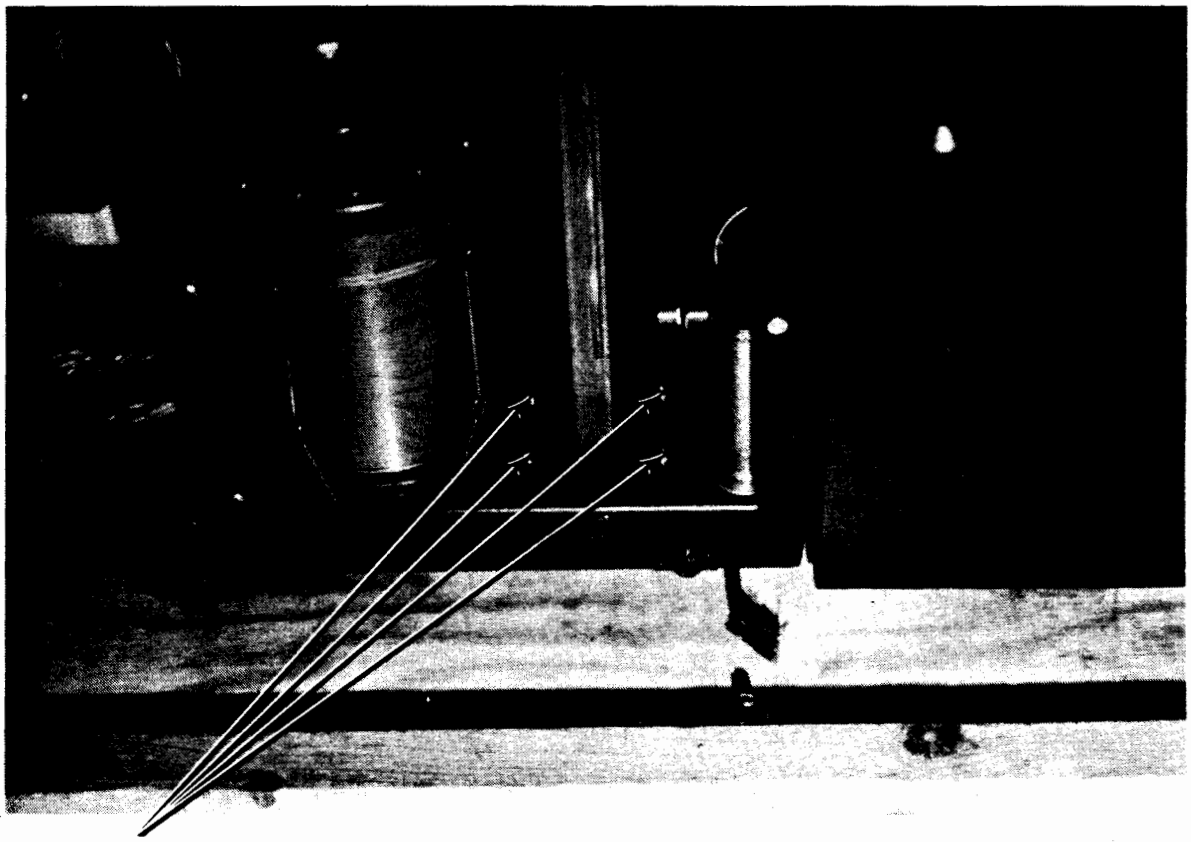
1. Remove 3 elevator front panel screws
2. Proximity switch connector
3. Top elevator mount screws
4. Elevator motor connector
5. Leadscrew
6. Stabilizer bar

Figure 4-44. Elevator Panels, Leadscrew and Top Proximity Switch.

J. Disconnect the preheater vacuum hose from the preheater filter.

K. Disconnect the top and bottom proximity switches and the elevator motor connectors, and the ground strap and proximity receptacle.

L. Remove the eight screws which secure the elevator assembly to the printer frame; four screws secure the bottom of the assembly to the printer frame and four screws secure the top of the assembly to the frame (two on the front side of the printer and two on the back of the printer), see figures 44 and 45. The two front screws are accessed by removing two covers from the front of the printer.



1. Bottom elevator mount screws

Figure 4-45. Elevator Assembly.

M. Tilt the top of the elevator assembly toward the rear of the printer, rotate the tray 90 degrees toward the PAMM unit, then remove the elevator assembly from the printer.

CAUTION

Whenever an elevator assembly is installed, the Elevator Proximity Switch Adjustment must be performed. Failure to do so could result in damage to the elevator assembly or the proximity switches refer to section 4-22.

Installation of the elevator assembly is the reverse of the procedure listed above.

4-21. ELEVATOR DRIVE BELT REPLACEMENT

To replace the elevator drive belt, proceed as follows:

\. Press and release the STACK DOWN switch on the paper control panel. Wait until the paper stacker reaches the bottom of its travel, then unload paper from the stacker.

WARNING

Ensure that the rear MAIN POWER breaker is OFF. Serious injury could result if the elevator motor were to operate while performing this procedure.

B. Set the rear MAIN POWER breaker to OFF.

C. Remove the printer rear panel.

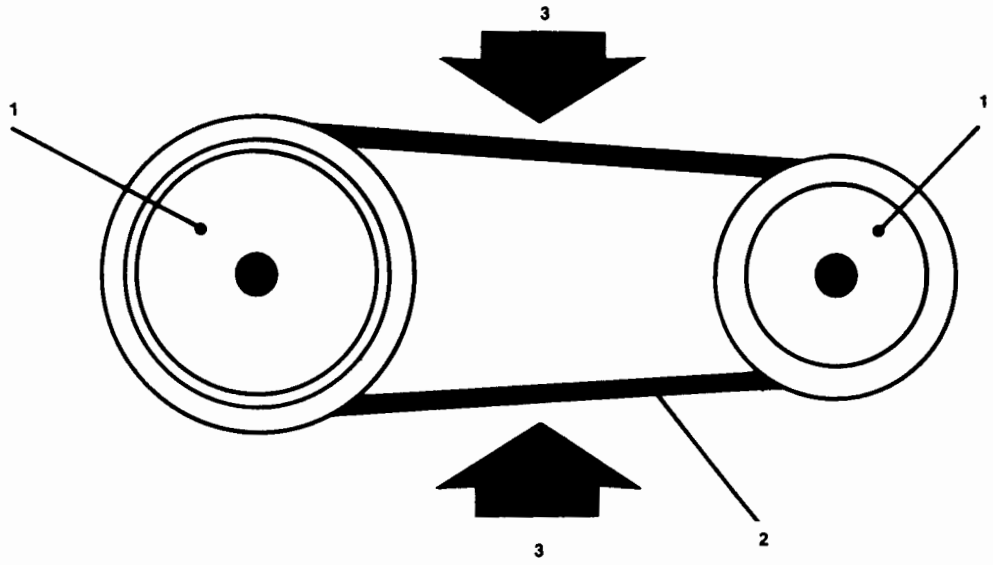
D. Remove the metal guard from the area around the leadscrew drive pulleys (see Figure 4-6).

E. Loosen the four screws which mount the elevator drive motor.

F. Slide the motor toward the leadscrew as far as it will go.

G. Twist the drive belt off the motor pulley, then remove the belt.

When the drive belt is installed on the pulleys, adjustment of the belt tension is critical. The pulleys must be positioned such that slack is taken up, but no tension is applied to the belt. Refer to Figure 4-46 to check for proper adjustment. Reverse the procedure listed above to install a new belt.



1. Pulleys
2. Belt
3. Distance from arrows=35 mm (+/-1 mm)

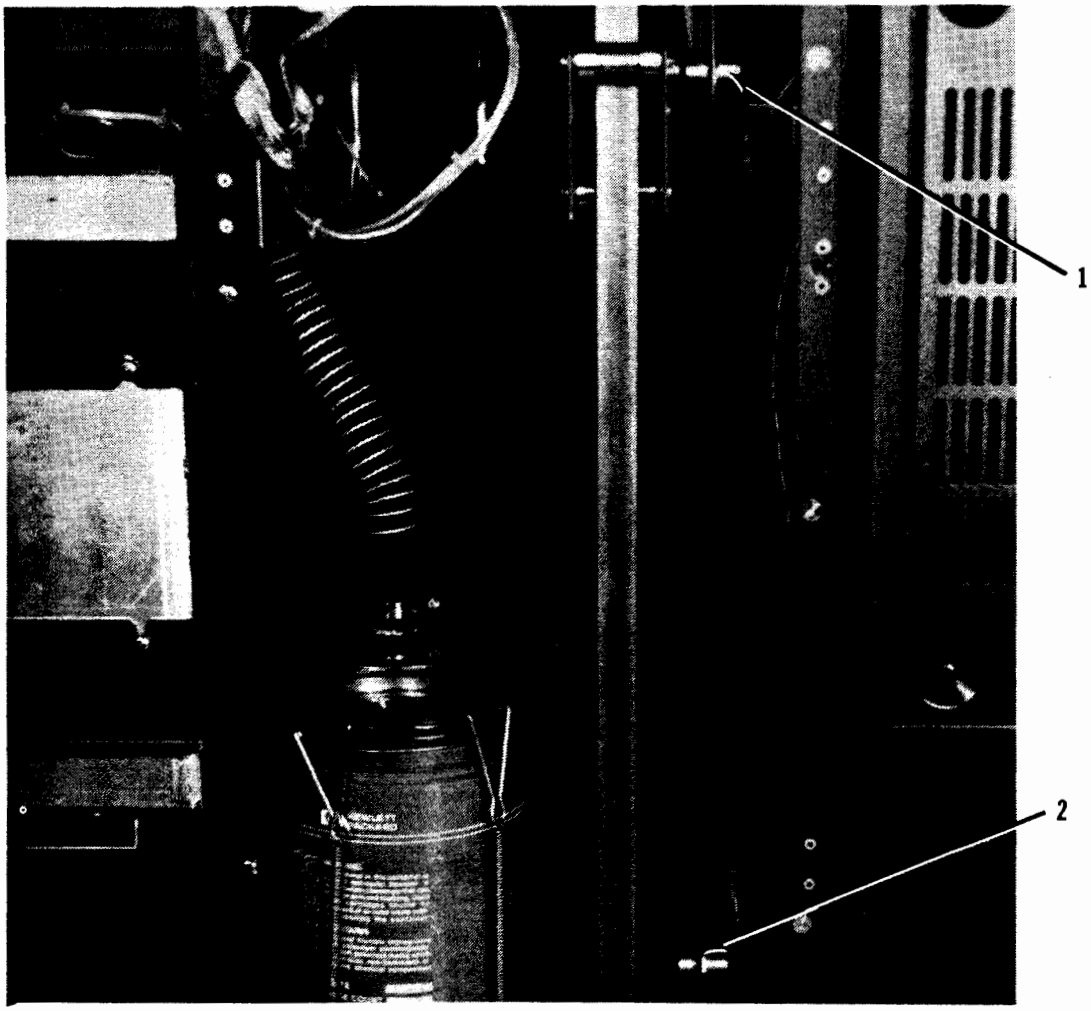
Figure 4-46. Elevator Belt Tension Adjustment.

4-22. ELEVATOR PROXIMITY SWITCH ADJUSTMENT

The elevator proximity switches must be adjusted to properly sense when the elevator tray is at the top or bottom, of its travel. If misadjusted, the proximity switches or the elevator assembly could be damaged. To adjust the proximity switches, proceed as follows:

A. Unload the stacker of paper if loaded. The PAMM door MUST BE CLOSED.

B. Position both proximity switches (see Figure 4-47) well into the mounting brackets, away from the leadscrew. This will prevent damage to the magnet or proximity switches when the elevator is raised or lowered.



1. Top proximity switch
2. Bottom proximity switch

Figure 4-47. Elevator Proximity Switches.

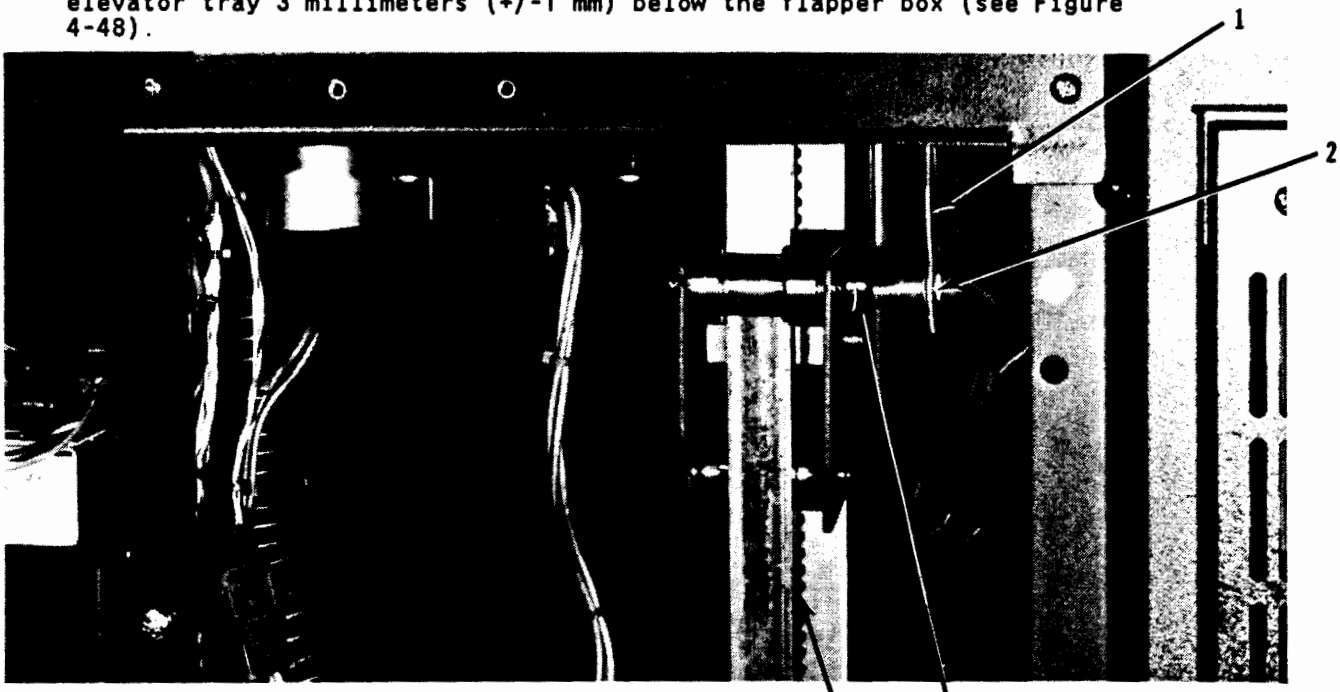
CAUTION

If the elevator is raised too high, damage to the elevator motor can result.

C. With power on, press the STACK UP switch on the paper control panel to raise the elevator. Press the STACK UP switch again to stop the elevator before the tray reaches the bottom of the flapper box.

D. Set the rear MAIN POWER breaker to OFF.

E. Manually turn the leadscrew to position the top of the outer edge of the elevator tray 3 millimeters (+/-1 mm) below the flapper box (see Figure 4-48).



1. Mounting bracket
2. Top proximity switch
3. Magnet
4. Leadscrew

Figure 4-48. Elevator Tray Alignment (Top Proximity Switch).

F. Position the proximity switch such that there is a 1 millimeter gap (+/-0.5 mm) between the switch and the magnet, and that the magnet is centered horizontally in respect to the switch.

G. Tighten the pair of nuts on the switch to fix the switch in this position.

H. Set the rear MAIN POWER breaker to ON.

I. Press the STACK DOWN switch to lower the elevator completely to the bottom of its travel.

J. Again, set the rear MAIN POWER breaker to OFF.

K. Repeat step F for the lower proximity switch.

L. Set the rear MAIN POWER breaker to ON.

M. Use the STACK UP and STACK DOWN switches to raise and lower the elevator to the top and bottom of its travel. Ensure that the elevator stops at both proximity switches and that the motor is off when the elevator is at the bottom of its travel.

4-23. ESM GAIN ADJUSTMENT

The ESM gain adjustment is not normally required unless excessive "ESM shut door test f" or "ESM open door test f" messages are occuring. Locate the Sensor Diagnostic parameter section of the Self Test printout. Note the "ESM voltage= xx" and the "Door voltage= xx" readings. Under normal operating conditions, the two measurements should compare within ±2 counts. If the measurements are not within ±2 counts, verify that the ESM solenoid and mechanical linkages are operating correctly. If the mechanical linkage is correct, adjust the ESM gain potentiometer on the Monitor PCA (Figure 4-34) until the measurements are within range.

NOTE

The self test will have to be started after each adjustment of the potentiometer.

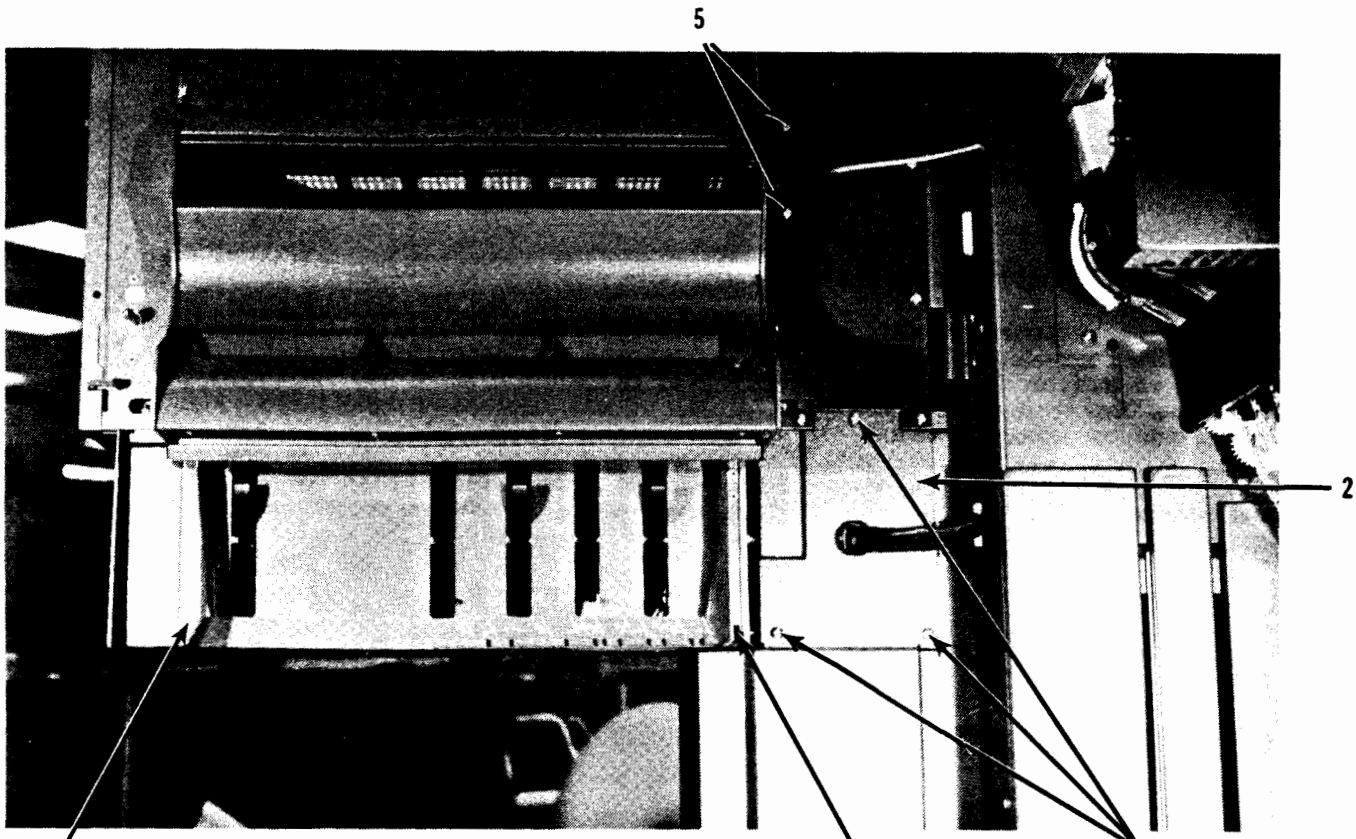
4-24. FLAPPER ASSEMBLY REPLACEMENT

To replace the flapper arms, motor or switch (top of stack switch) proceed as follows:

A. Set the rear MAIN POWER breaker to OFF.

B. Open the PAMM door.

C. Remove the three cross-hatched screws which secure the lower PAMM door cover and remove the cover (see Figure 4-49).



1. Remove 3 screws
2. Lower PAMM blower cover
3. Compactor guide
4. Facia plate
5. DO NOT remove (see note below)

Figure 4-49. PAMM Door.

NOTE

If screws shown in Figure 4-49 are removed, a plate will fall into the PAMM door. Accessing the plate then requires disassembling the PAMM door. DO NOT Remove these screws.

D. Using a 1.5 mm internal hex driver (allen wrench) remove the set screw which secures the collar holding the motor to the shaft. The set screw is located to the right of the right side wall. Slide the motor off the shaft (to the right). This exposes the top of stack switch.

Proceed with step E to replace the flapper arms. To replace the flapper motor or the top of stack switch, skip to step M.

E. Move the compactor guide all the way to the right.

F. Remove the black paper deflector. The two mounting screws are located near the top inside edge of the flapper box.

G. Move the compactor guide all the way to the left.

H. Remove the four screws located on the underside of the flapper box which secures the facia plate to the flapper box.

I. Pull the facia plate straight toward you to remove it.

J. Remove the E-ring at the opposite end of the flapper shaft.

K. Push the flapper shaft to the left until it clears the motor shaft, then pull the flappers free of the flapper box.

L. Replace the flapper arms by removing the E-rings and the pins and sliding the arms off the shaft. Ensure that the new arms are installed with their curves in the same direction as the old arms, and that each arm is in an alternating position (90 degrees out of phase) with respect to the adjacent arms.

Replace the flapper motor or the top of stack switch as follows:

M. Detatch the spring from the motor assembly.

N. Remove the wires from the motor connector and attach the new motor wires.

O. Replace the top of stack switch by removing the two screws securing the switch to the PAMM door.

P. Remove the wires connecting the switch and remove the switch.

To install the flapper arms in the flapper box, reverse the procedure listed above. Ensure that the flat surface of the motor shaft is engaged by the set screw when the flapper shaft and motor shaft are joined.

Reverse the removal procedure for the motor and switch outlined above. The flapper motor should rotate and a clicking noise from the top of stack switch should be heard.

4-25. FLAPPER BOX ADJUSTMENT

The flapper box position must be occasionally checked and adjusted to ensure proper compression and stacking of the paper stack. To check and/or adjust the flapper box, proceed as follows:

A. Set the rear MAIN POWER breaker to OFF.

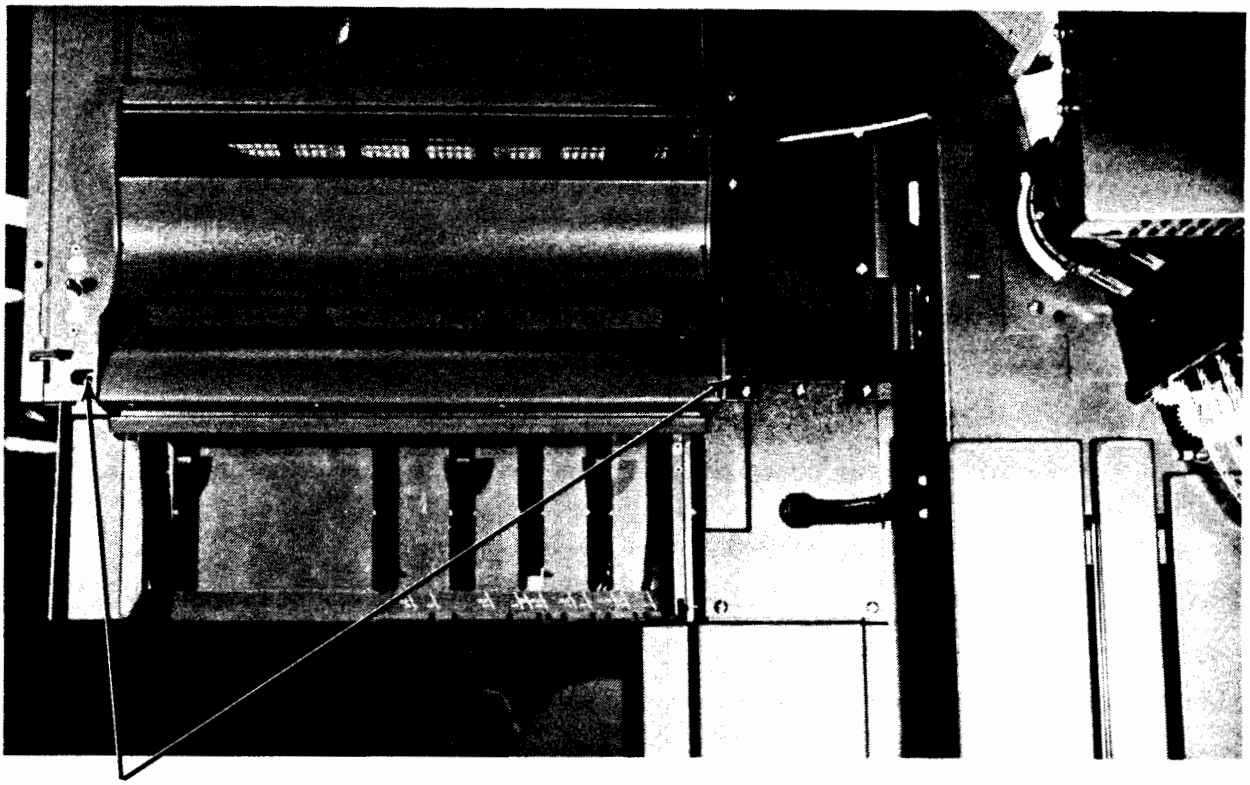
B. Tear off paper (if loaded) above the output tractors.

NOTE

For explanation purposes, the 8.5 inch position on the Paper Length Adjust knob is used in this procedure. However, any position of the knob is acceptable, provided that a gauge corresponding to this length is used to make the adjustment.

C. Position the Paper Length Adjust knob for 215 mm (8.5 in.) paper.

D. Loosen the two screws located on both sides of the PAMM unit (see Figure 4-50).

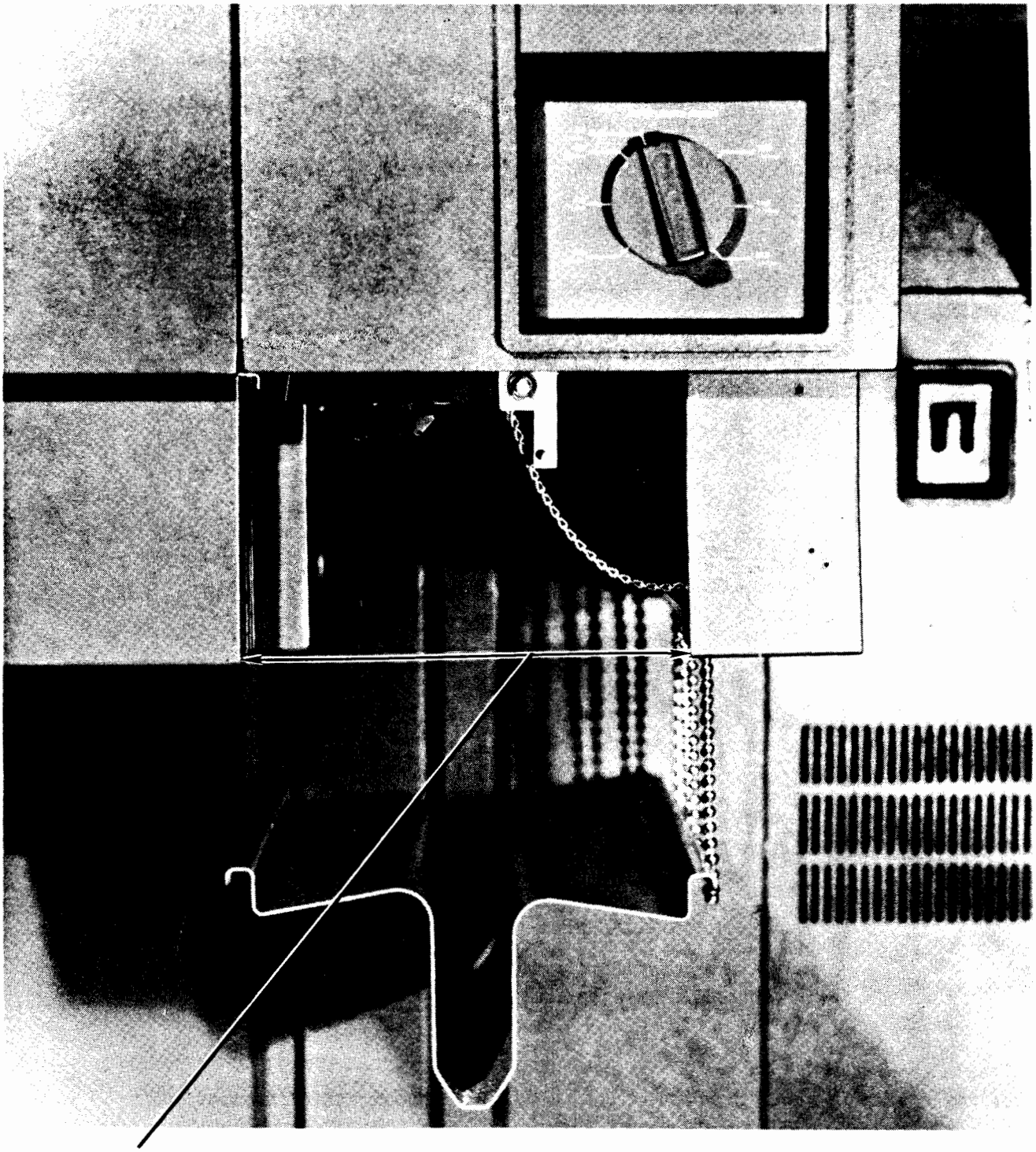


1. Loosen 2 screws

Figure 4-50. Flapper Box Adjustment Screws.

E. Gently close the PAMM door.

F. Use any type gauge which is equal in length to the Paper Length Adjust knob setting (in this case, 8.5 inches or 215 mm). Measure between the facing surfaces of the chain box and the flapper box below the compression bars, at both the front and the rear (see Figure 4-51). Ensuring that the flapper box and the chain box are parallel, adjust these surfaces to be exactly 8.5 inches apart.



1. Paper length

Figure 4-51. Paper Length Adjust.

G. Carefully open the PAMM door to avoid disturbing the position of the flapper box.

H. Tighten moderately the two screws which were loosened in step D.

I. Swing the PAMM door closed again and check the alignment on the flapper box. If the position of the box has changed, repeat steps D through H.

J. If the flapper box alignment is acceptable, tighten the two screws until they are snug.

K. Check the alignment of the flapper box again. If necessary, repeat the alignment.

L. Reload paper and continue normal operation.

4-26. FUSER LAMP REPLACEMENT

To replace the fuser lamp, proceed as follows:

WARNING

Ensure that the MAIN POWER Breaker is turned OFF. If the power is not turned off, 220 volts will be applied to the connectors of the fuser bulb.

WARNING

If the printer has been operating, or the EJECT ALL or EJECT SINGLE on the Paper Control Panel has been pressed, allow 30 minutes after the rear MAIN POWER breaker has been set to OFF before attempting to remove the fuser lamp. Burns will result if you touch the preheater before it has been allowed to cool.

CAUTION

Handle the fuser lamp only by the two ends. Skin oils can greatly decrease the life of the lamp.

A. Set the rear MAIN POWER breaker to OFF. Wait 30 minutes before continuing.

B. Open the printer top cover.

C. Open the PAMM unit.

D. Remove the fusing system cover (held by four screws).

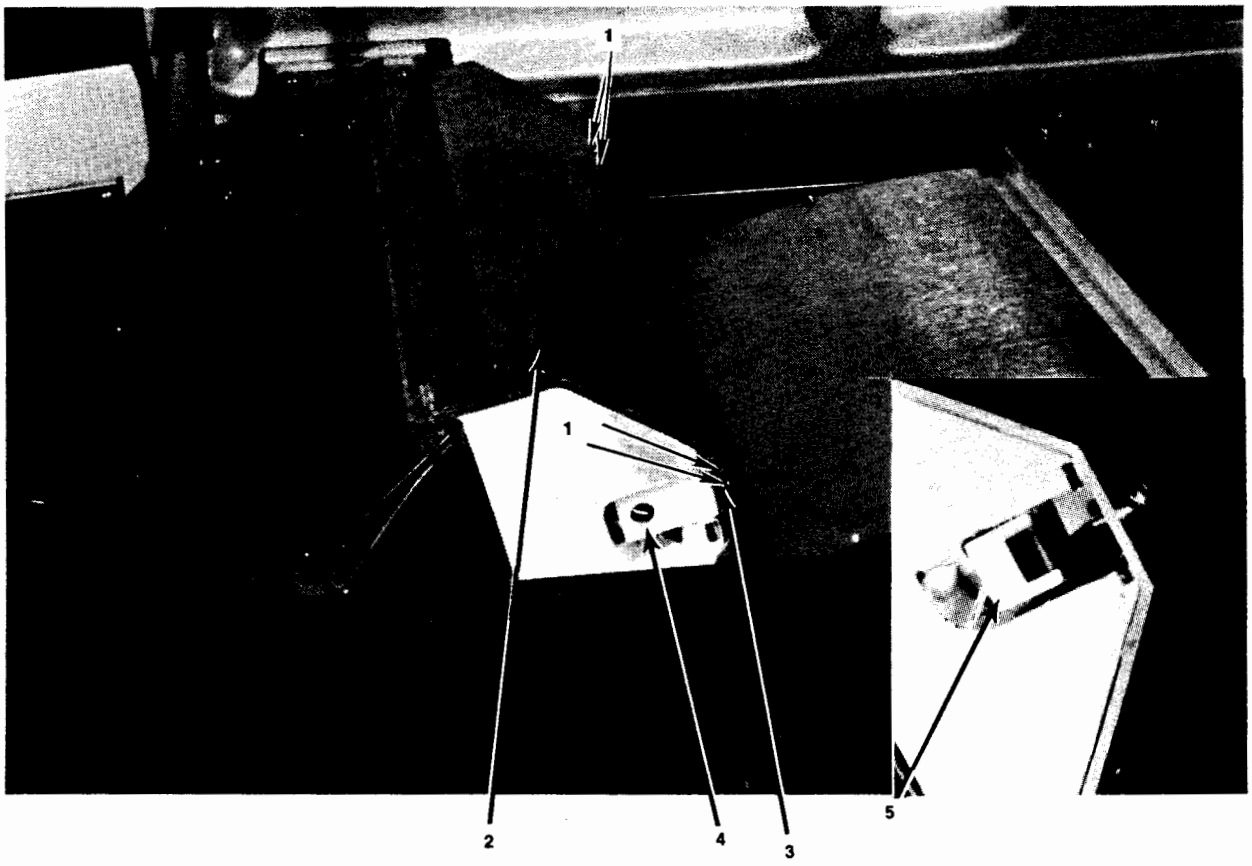
E. Lift the fuser unit into the service position.

WARNING

The fuser lamp may break during removal. Wear safety goggles and handle the bulb with several disposable wipers to protect your hand in case the lamp does break.

F. There are 2 styles of endblock used in the HP 2680 printer. The old and new styles are shown in Figure 4-52. If the printer has the new style of endblock (HP part number 02682-60568) the lamp can be removed by pushing it to the rear and removing it, then proceed to step H. If the printer has the old style endblock, (HP part number 02682-60518) proceed to step G.

G. Loosen the lamp mounting screw on the end of the fuser assembly (see Figure 4-52). The loosening of this screw releases tension on the fuser lamp and allows it to be removed.



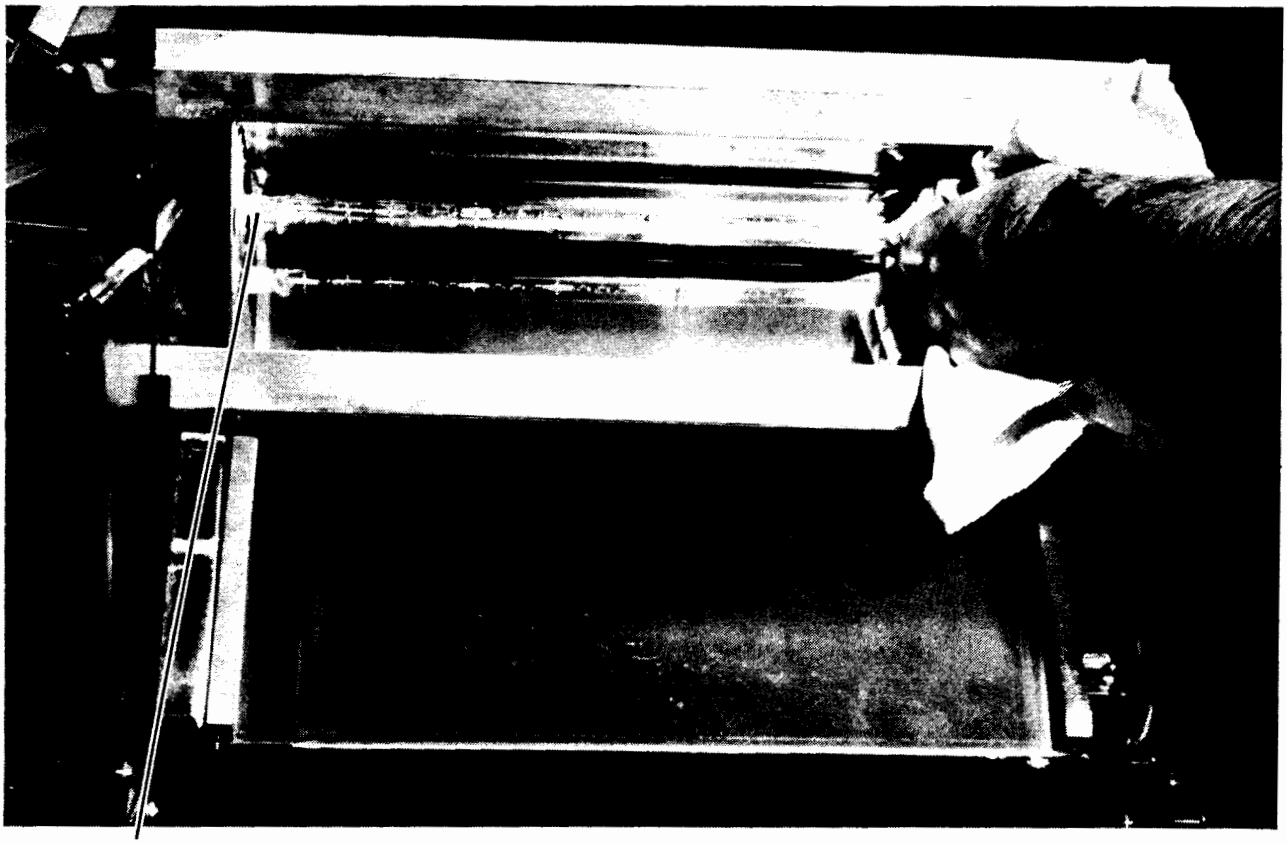
1. Remove 4 screws
2. Fusing system cover
3. Loosen fuser lamp mounting screw
4. Old style endblock
5. New style endblock

Figure 4-52. Fuser Lamp Mounting Screws.

NOTE

If the fuser lamp is excessively tight, it may be necessary to loosen the mounting screws on both ends of the fuser assembly.

H. Grasp the lamp as shown in Figure 4-53 and push the lamp towards the front of the printer until the back of the fuser lamp clears the connector. Lift up on the back of the lamp, straighten the lamp out and remove the lamp from the printer. Care must be taken not to break-off the tip of the fuser lamp. Always handle the fuser lamp with wipes to prevent contaminating the lamp surface with skin oils.



1. Grasp lamp only by the flat ends

Figure 4-53. Fuser Lamp Removal.

NOTE

If the new fuser lamp accidentally contacts your skin, clean the contaminated portion of the lamp with isopropyl alcohol.

I. Visually inspect the fuser lamp contactors at both ends of the fuser unit for any signs of electrical arcing or a buildup that would prevent good electrical contact with the lamp. Replace both contactors if either of these conditions exist.

J. Adjust both fuser contacts for the proper tension before installing the fuser bulb. To do so, tighten each contact screw clockwise until it stops.

Installation of a fuser lamp is the reverse of the above procedure. Ensure that the lamp is inserted in the rear contact first, then pushed to the rear to insert the front end.

4-27. HIGH VOLTAGE POWER SUPPLY PCA

Replacement of the High Voltage Power Supply PCA requires no adjustment; however, the Developer Bias Voltage should be verified when the PCA is replaced. Refer to section 4-13 for the Developer Bias Adjustment procedure.

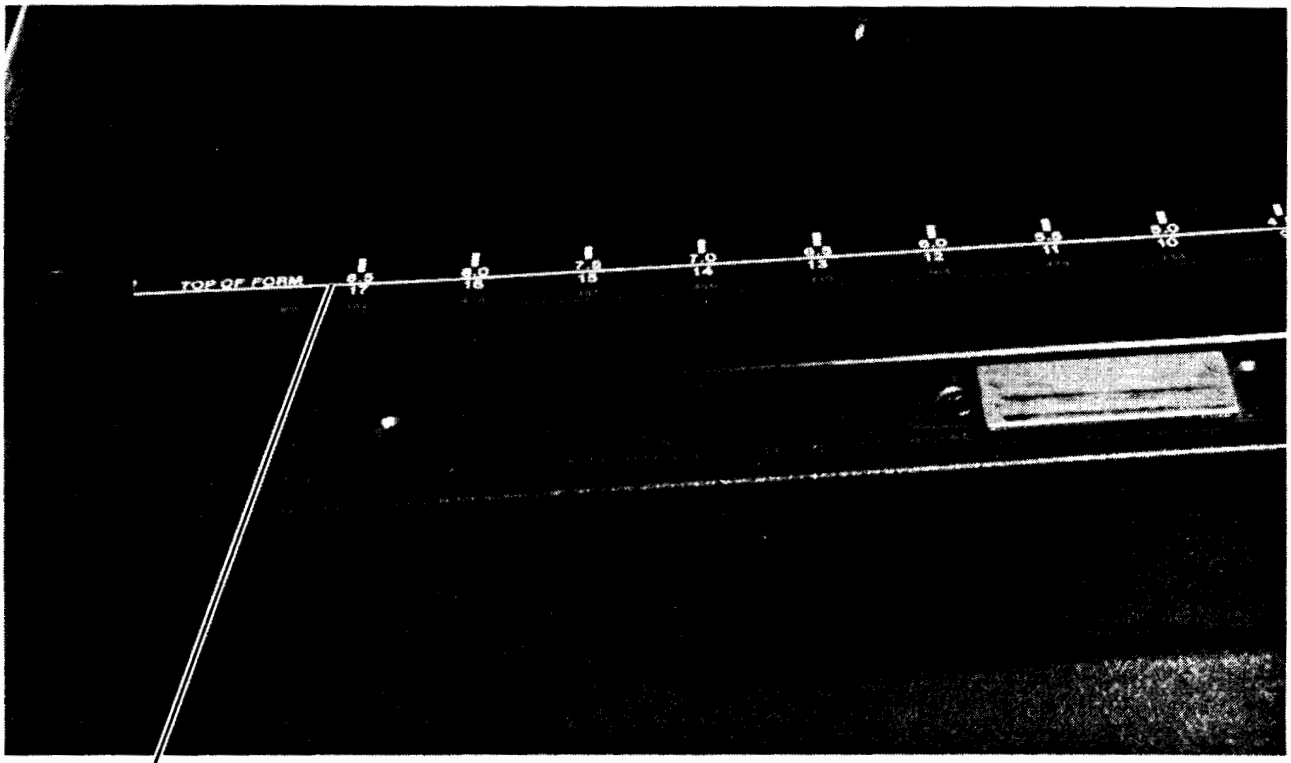
4-28. INPUT STEPPER REGISTRATION ALIGNMENT

The position of the input stepper motor is monitored using the encoder disc and the stepper drive circuit. Once the stepper position has been initialized using the Stepper Registration Mode command (602), the steppers should always be in the correct placement with respect to the print transfer and top of form positions. Use of the PAPER FORWARD key moves paper to a position where page perforation can be aligned with the top of form marks in the review window. (However, the page perforation can appear to drift slightly because of paper variations.) The input stepper system should only be reinitialized in the case of one of the following conditions:

- A non-volatile memory failure destroys the registration values for the stepper system. The stepper registration mode is automatically entered upon initializing the non-volatile RAM.
- If the message "Stepper init error" is displayed, the registration values in non-volatile memory are out of bounds and the stepper registration mode must be entered to reinitialize the stepper system.
- A mechanical change is made to the paper system such that the top of form can no longer be aligned. Again, the stepper registration mode must be entered to reinitialize the stepper system.

To adjust the input stepper registration, proceed as follows:

A. Enter the service command mode by pressing 631, ENTER, 2680, ENTER at the printer's service control panel.



1. Top of form marks

Figure 4-54. Top of Form Alignment Scale.

B. Enter the input stepper position initialization mode by pressing 602, ENTER.

C. Press the RUN key to advance the input tractors until the page perforation is aligned on any 0.5 inch Top of Form scale alignment mark (see Figure 4-54).

NOTE

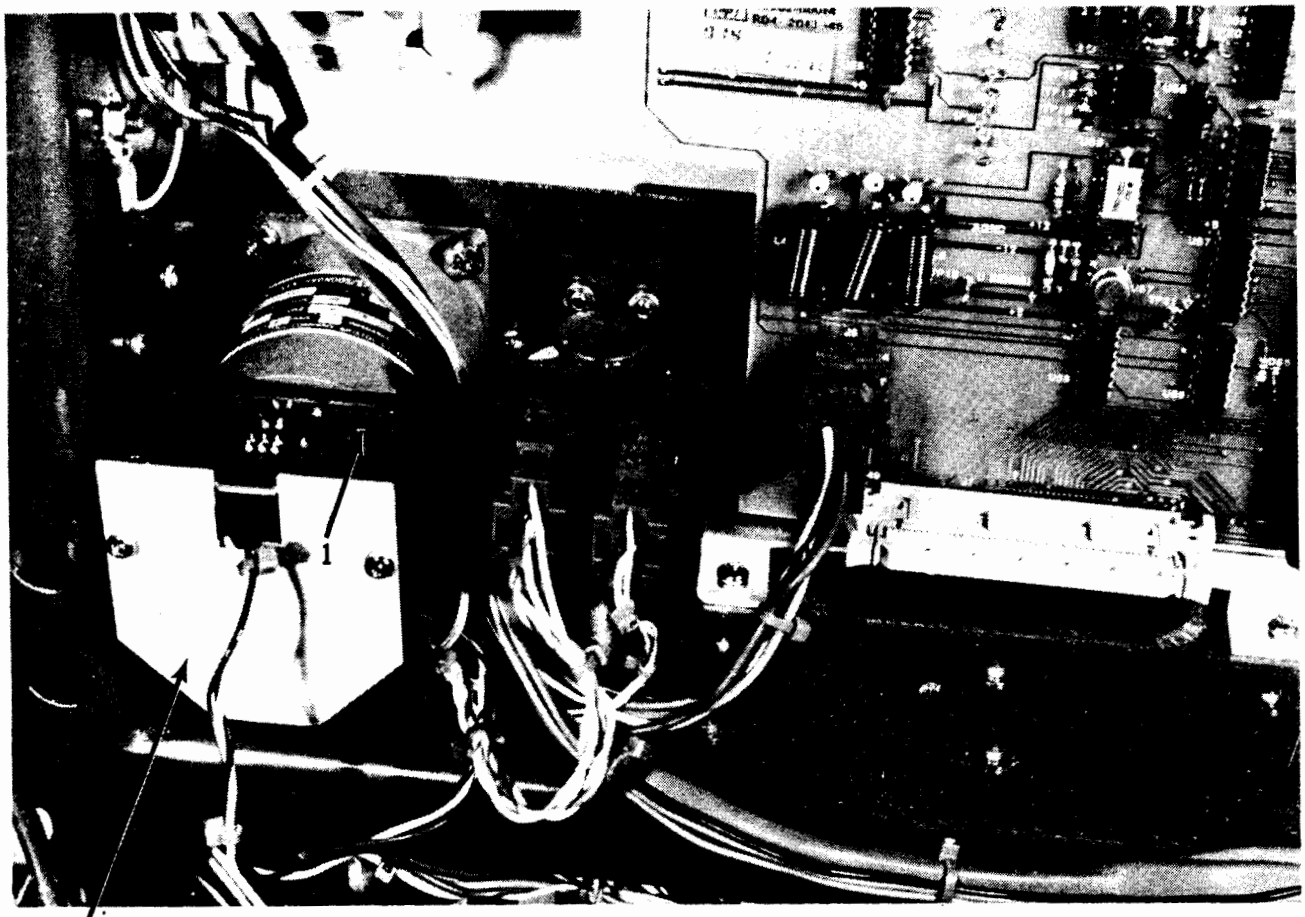
Pressing the RUN key advances the paper in .0125 inch increments. The alignment resolution between the page perforation and the Top of Form scale alignment marks can not be less than this increment.

When satisfactory alignment is achieved press HALT. This establishes the present encoder position as the "base position" which is any 0.5 inch multiple unit from the Top of Form mark. Each time the PAPER FORWARD key is pressed, the stepper motor (driving the input tractors) advances the paper to the next base position (0.5 inch increment).

If the "**Invalid step position**" message is displayed after performing the alignment, mechanical alignment of the stepper encoder disc is necessary. If no error message occurs, proceed to step N.

D. Remove the printer rear panel.

E. Remove the encoder cover plate on the stepper motor (see Figure 4-55).



1. Access to set screw
2. Encoder cover plate

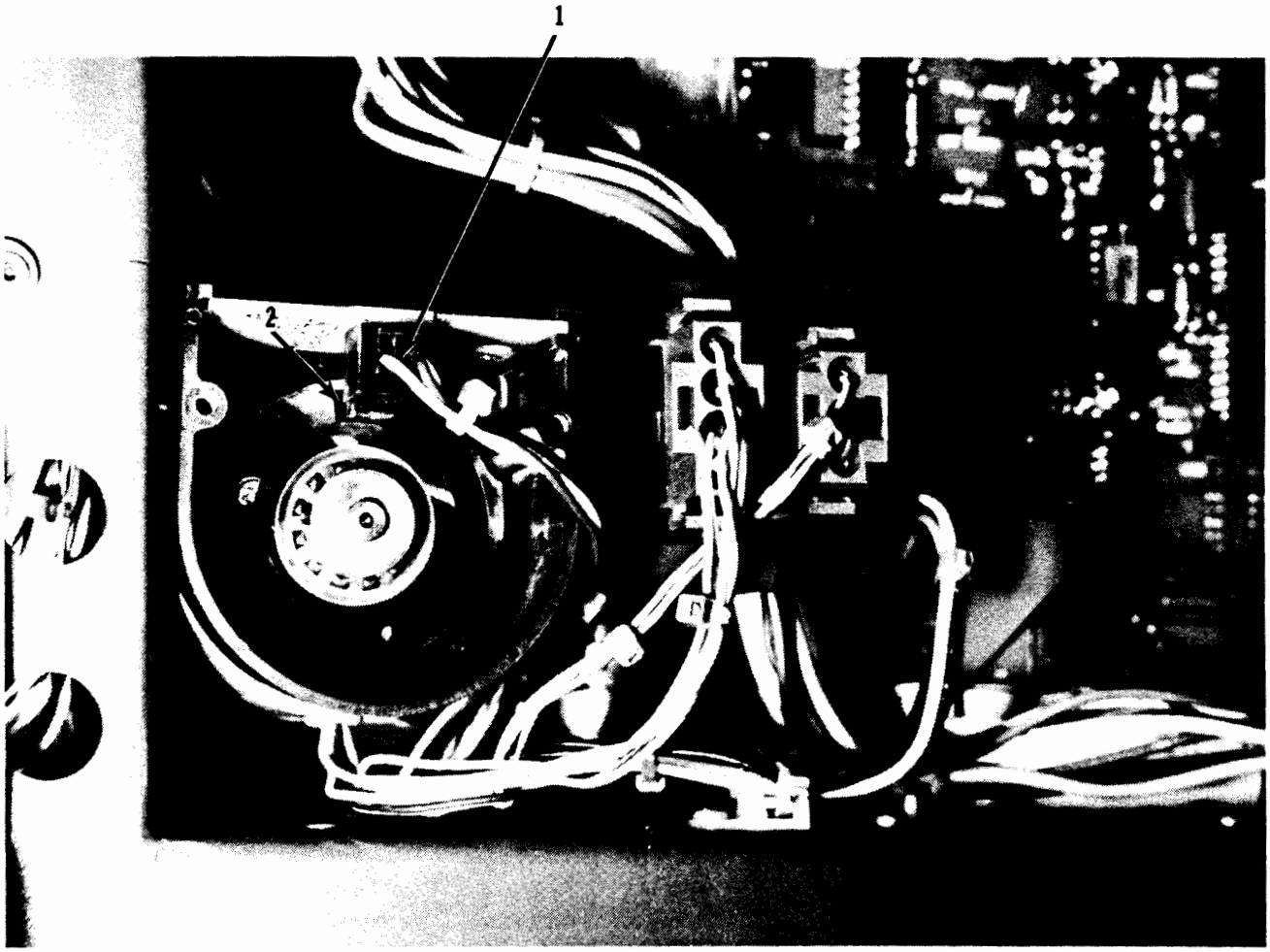
Figure 4-55. Stepper Motor Encoder (Cover Plate).

F. Set the rear MAIN POWER breaker to OFF and remove the paper from the input tractors.

G. Rotate the input tractors until the encoder set screw on the Stepper Motor Encoder faces the hole on the Encoder PCA (this is approximately at the 1:00 o'clock position). This provides easy access for loosening the set screw.

H. Using a 1.5 mm internal hex driver (allen wrench) loosen the set screw which secures the encoder disc to the stepper motor drive shaft.

I. Without turning the shaft, move the encoder disc to position the slot in the disc such that the center of any open slot is directly between the encoder sensor (see Figure 4-56).



1. Encoder sensor
2. Slot

Figure 4-56. Stepper Motor Encoder (Sensor and Slots).

J. Carefully tighten the encoder disc set screw so that the stepper motor drive shaft does not move.

K. Install the encoder cover plate and printer rear panel.

L. Set the MAIN POWER breaker to ON and reload paper.

M. Repeat steps A through C.

N. Use the PAPER FORWARD key to advance the paper to Top Of Form and resume printing.

4-29. INPUT TRACTOR and STEPPER MOTOR REPLACEMENT

NOTE

The input tractors have been changed from a square shaft to a splined shaft (as of 6/83). To solve the interchangeability problem between new and old parts, a new hub should be stocked for service. Any tractor or stepper motor currently being used can be modified to work with either shaft. The HP part numbers for the old or new parts are:

Input stepper motor and shaft:
Old, square-02682-60346
New, splined-02682-60558

Input tractor assembly:
Old, left-1530-0370
Old, right-1530-0371
New, left-1530-0398
New, right-1530-0399

Input tractor hub:
Splined hub, 1500-0654
No square hub number available

The input tractors MUST be replaced as a matched set. Do not attempt to replace single tractors. To replace the input tractors, proceed as follows:

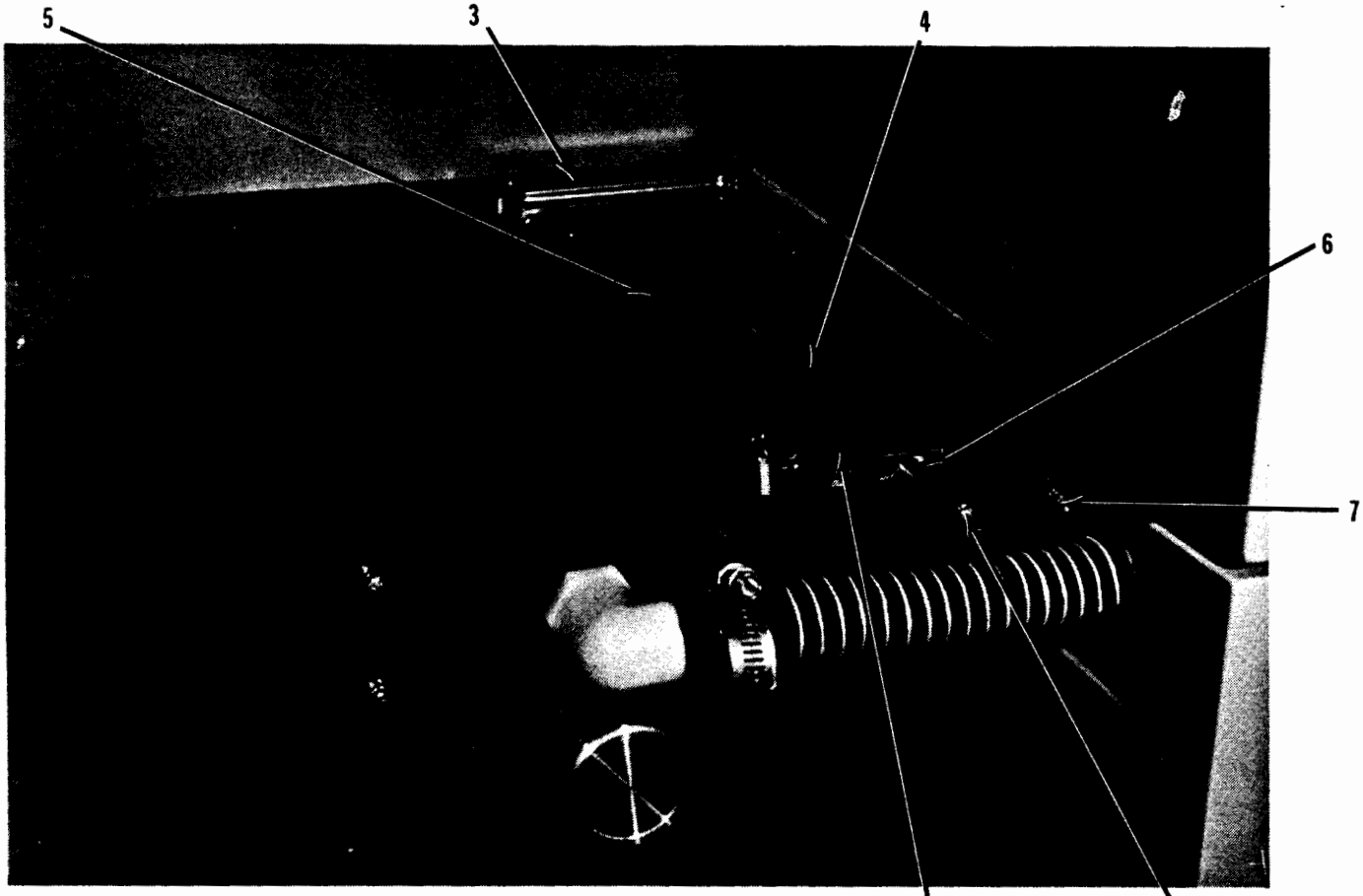
WARNING

Set the rear MAIN POWER breaker to OFF. Hazardous voltages may be encountered while performing this procedure.

A. Remove paper from the printer.

B. Remove the two screws on the underside of the input tray front cover.

C. Open the front door and remove the screw below the door latch mechanism, then slide the cover to the left to expose the ends of the input tractor shafts (see Figure 4-57).

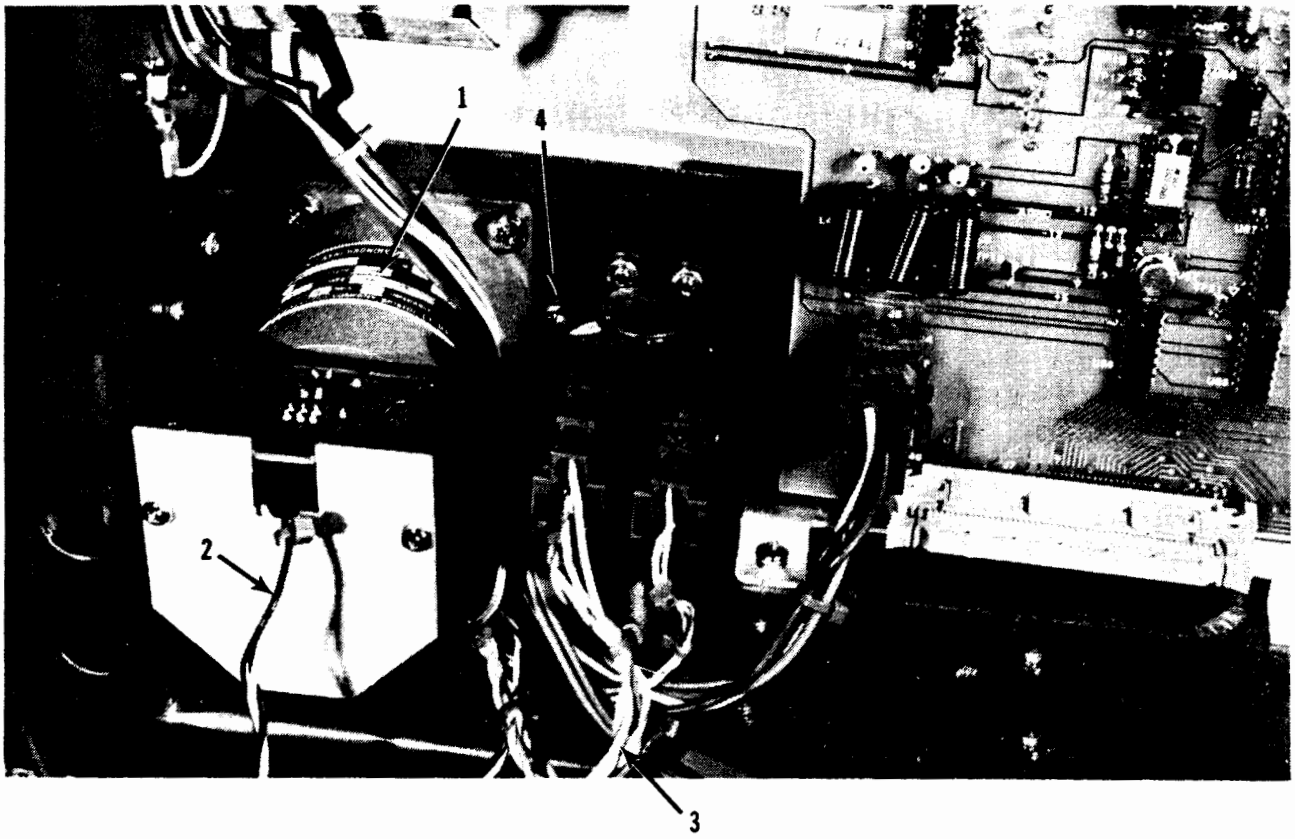


1. Remove front support screw
2. Front tractor
3. Rear tractor
4. Support shaft
5. Tractor follower
6. Snap ring
7. Drive shaft

Figure 4-57. Input Tractor (Front Tractor Cover Removed).

D. Remove the printer rear panel.

E. Disconnect the stepper motor power cable and the encoder cable from the stepper motor (see Figure 4-58).



1. Stepper motor
2. Encoder cable
3. Stepper motor cable
4. Rear support screw

Figure 4-58. Stepper Motor.

F. Remove the four stepper motor mounting screws then pull the stepper motor and drive shaft out of the printer. If you are removing the stepper motor only, continue at step L of this procedure.

G. Using a 2 mm internal hex driver (allen wrench) remove the support shaft mounting screw located to the right of the opening vacated by the stepper motor.

CAUTION

Do not allow the paper width follower band to become twisted or flexed while the input tractor assembly is being handled. Replacement of the paper width sensor may be required.

NOTE

If the support shaft is pulled out of the unit too far, the paper width sensor will become disconnected from the follower. This would require an additional adjustment procedure to be performed.

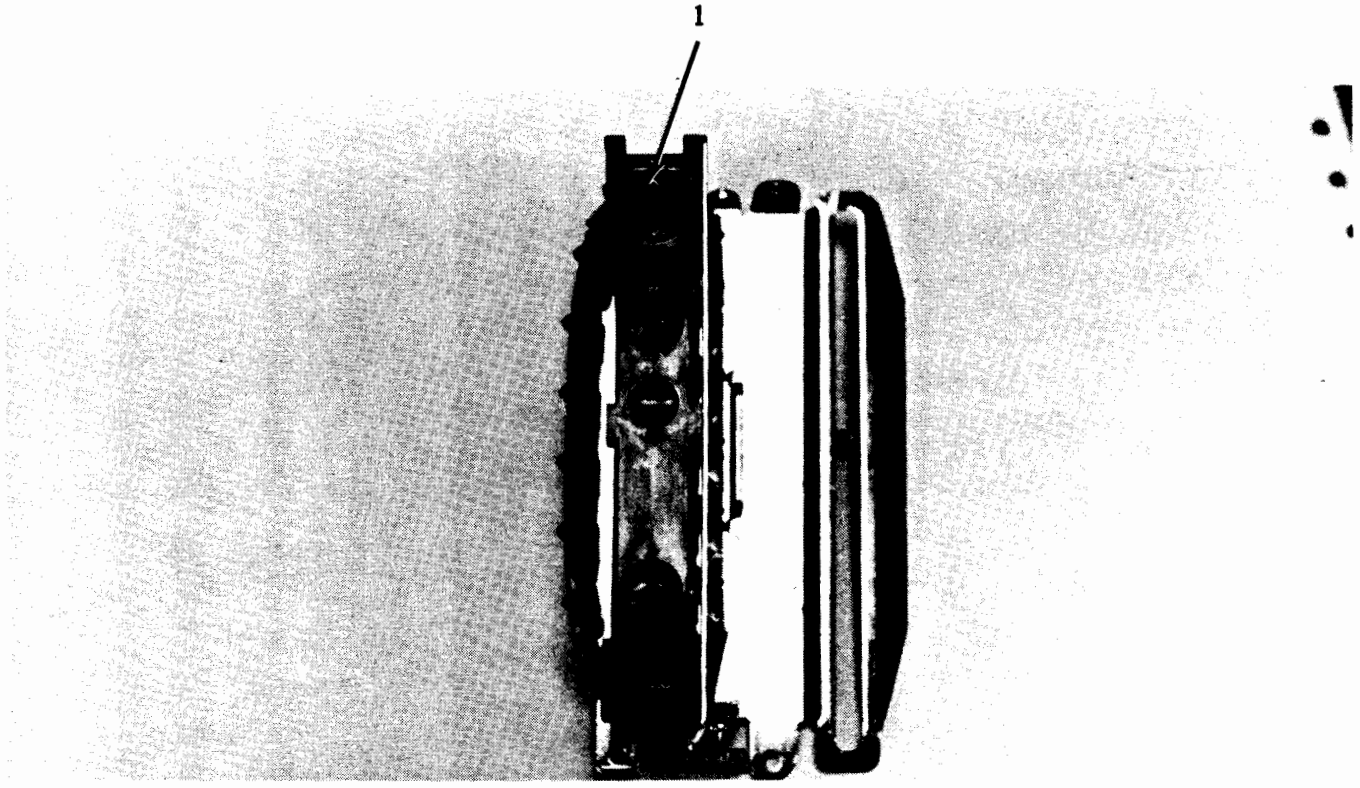
H. Hold the support shaft while removing the front support shaft mounting screw.

I. Remove the snap ring located forward of the front input tractor on the support shaft (round bar).

J. Tilt the support shaft upward just enough to clear the input frame assembly, then pull the shaft outward about one fourth the length of the shaft.

K. Slide the forward tractor off the shaft, then gently slide the rear tractor and tractor follower (with metal band attached) off the end of the shaft.

L. When installing input tractors on the tractor shaft, ensure that the alignment marks located on the inward side of the tractors (see Figure 4-59) are lined up on the same corner of the shaft. Paper skew will result if this is not done. Ensure that the Encoder PCA is located on the top of the stepper motor when the motor is installed.



1. Alignment marks

Figure 4-59. Input Tractors (Tractor Alignment Marks).

M. Reverse the procedure listed above to install the input tractors.

N. Remove the encoder assembly cover located on the rear of the input paper motor. Ensure that any slot in the encoder disc is centered behind the encoder sensor. It will be necessary to loosen the set screw on the encoder disc to turn the disc.

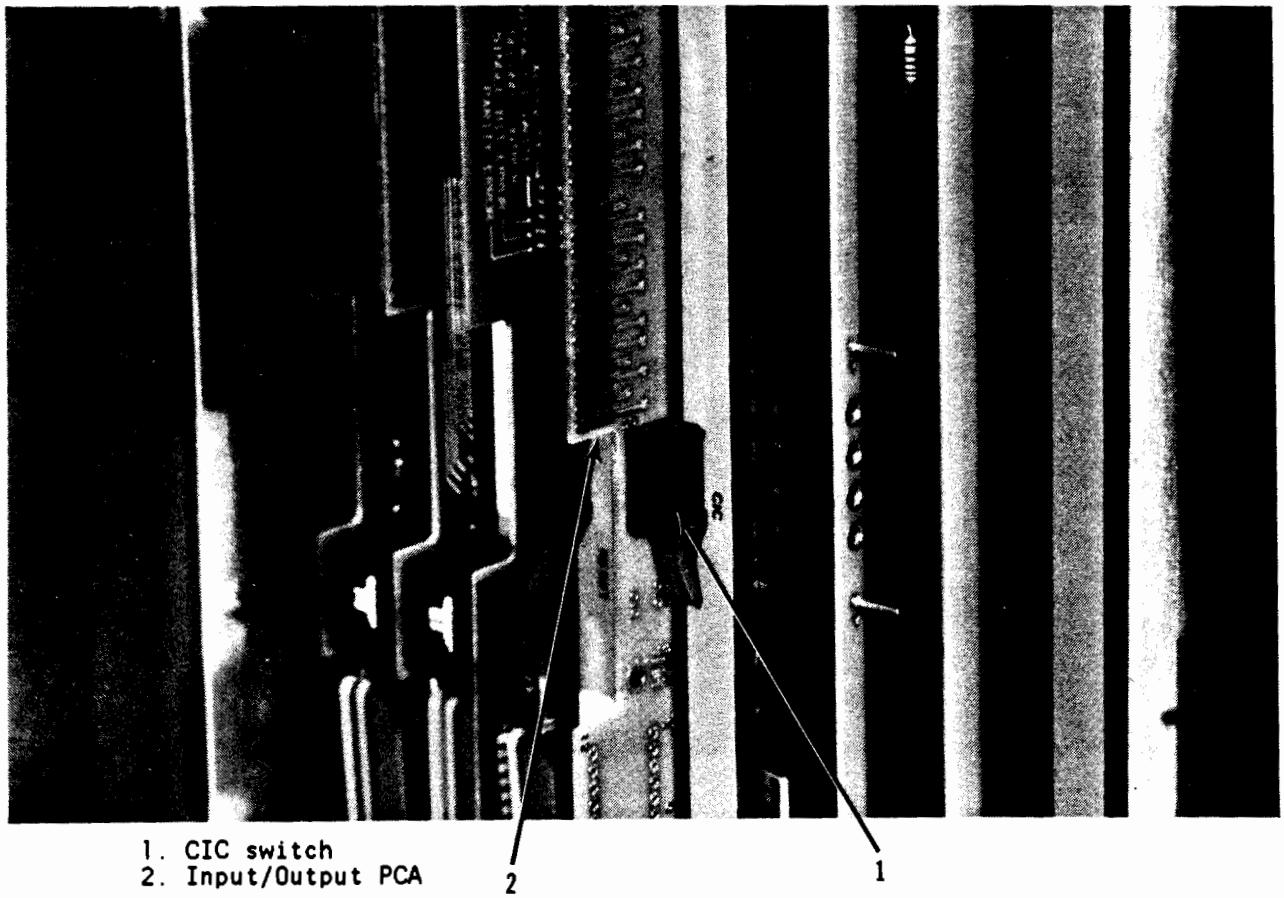
O. Perform the Paper Width Sensor Adjustment as described in section 4-42 of this manual.

P. Perform the Input Stepper Registration Alignment as described in section 4-28 of this manual.

4-30. INPUT/OUTPUT PCA ADJUSTMENT

When installing a new Input/Output PCA in the printer, the Controller In Charge (CIC) toggle switch must be positioned for proper system operation using the following procedure.

The CIC switch (see Figure 4-60) is set to the CIC (barred, toward the PCA stiffener) position for system operation. The opposite switch position is not used at this time.



1. CIC switch
2. Input/Output PCA

Figure 4-60. Controller in Charge Switch (I/O PCA).

NOTE

The bottom connector should be checked before operating the printer to ensure that pin 1 of the PCA connector contacts pin 1 of the ribbon connector. When properly installed the red edge of the connector should face up.

NOTE

The new DCS Input/Output PCA is compatible with all Data Processor PCA PROMs, HP part number 02682-60583.

4-31. LASER ASSEMBLY REPLACEMENT

To replace the laser assembly, proceed as follows:

WARNING

Hazardous voltages and laser light may be encountered if this procedure is not correctly followed.

A. Set the rear MAIN POWER breaker to OFF.

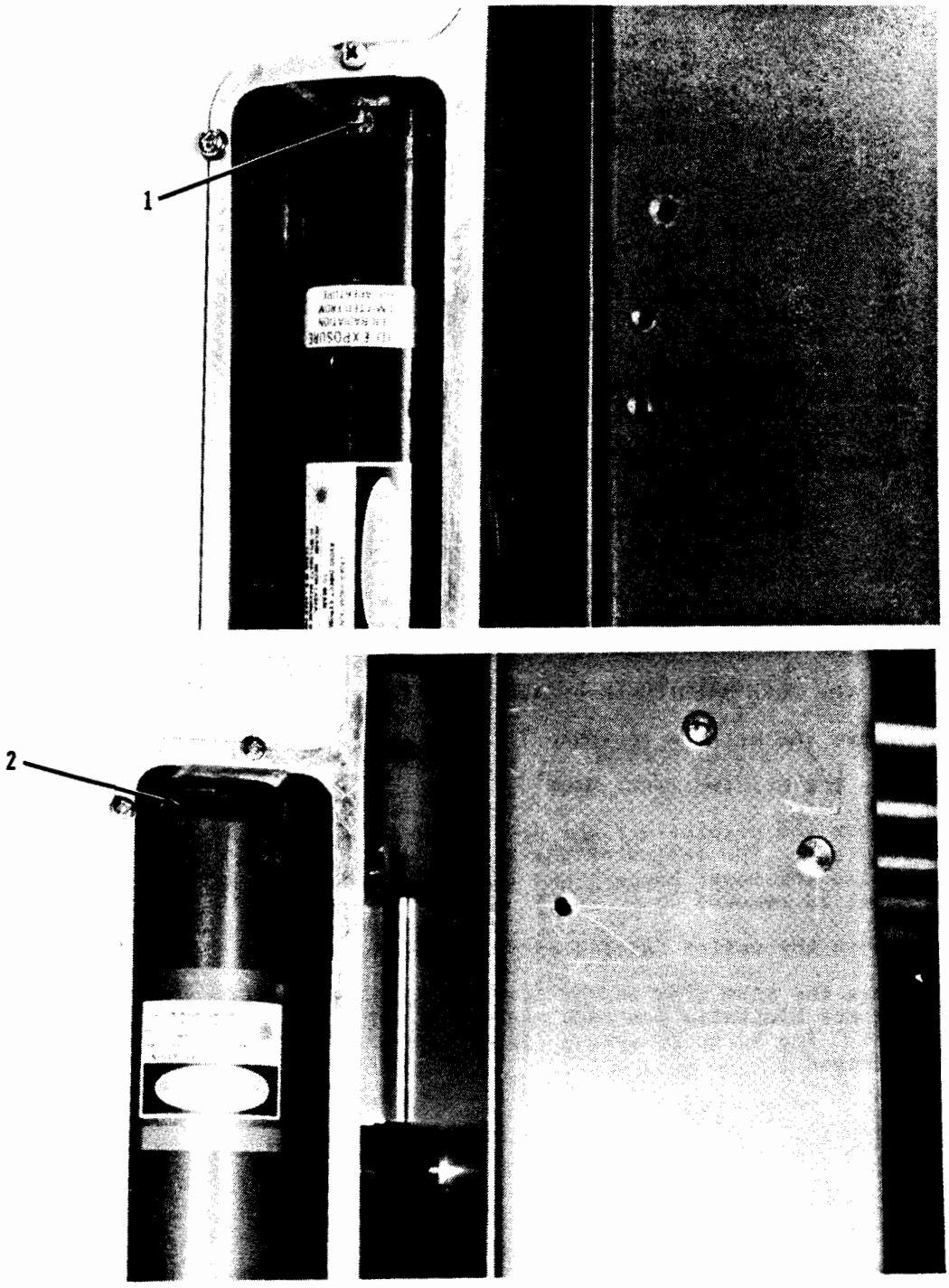
B. Remove the printer rear panel.

C. Open the printer front door.

D. Remove the printer's right side outer panel. Two quarter turn fasteners are located on the inside of the end rails. The front fastener is located behind the toner hopper, and the rear fastener is exposed whenever the rear panel is removed.

E. Remove the optics casting cover and frame brace.

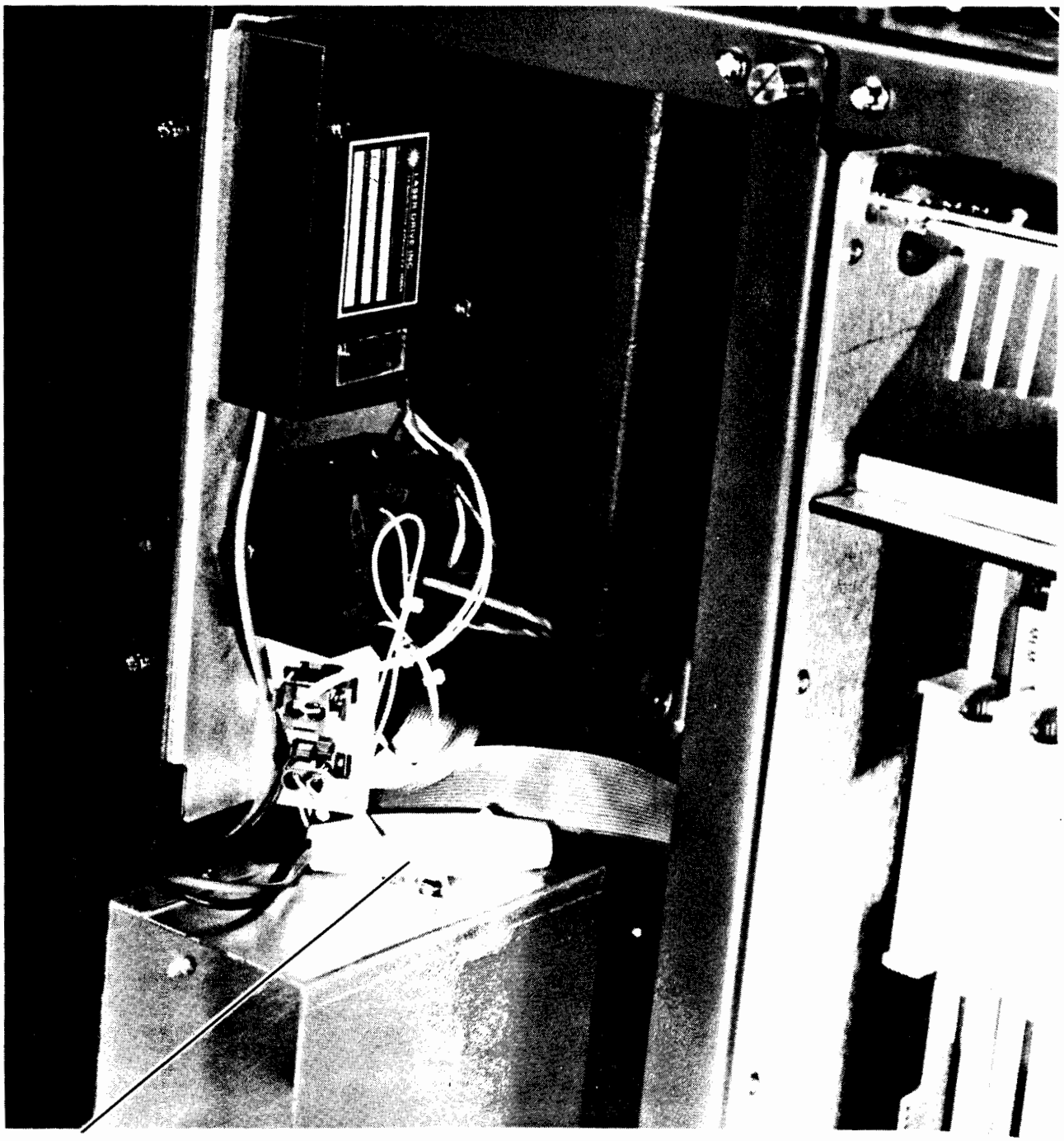
F. Close the beam stop on the laser by turning the screw (see Figure 4-61) 90 degrees clockwise (on some models) or sliding the beam stop switch to the left. The screw is spring loaded (captive) and springs outward when released.



1. Beam stop set screw
2. Beam stop switch

Figure 4-61. Laser Beam Stop Screw and Switch.

G. Disconnect the laser high voltage power cable (see Figure 4-62). Momentarily short the exposed contacts together against the optics casting to avoid a potential shock hazard, see Figure 4-63.



1. Laser high voltage power cable

Figure 4-62. Laser High Voltage Cable.

H. Feed the laser high voltage cable through the opening in the optics casting and remove the screws which secure the cable to the casting.

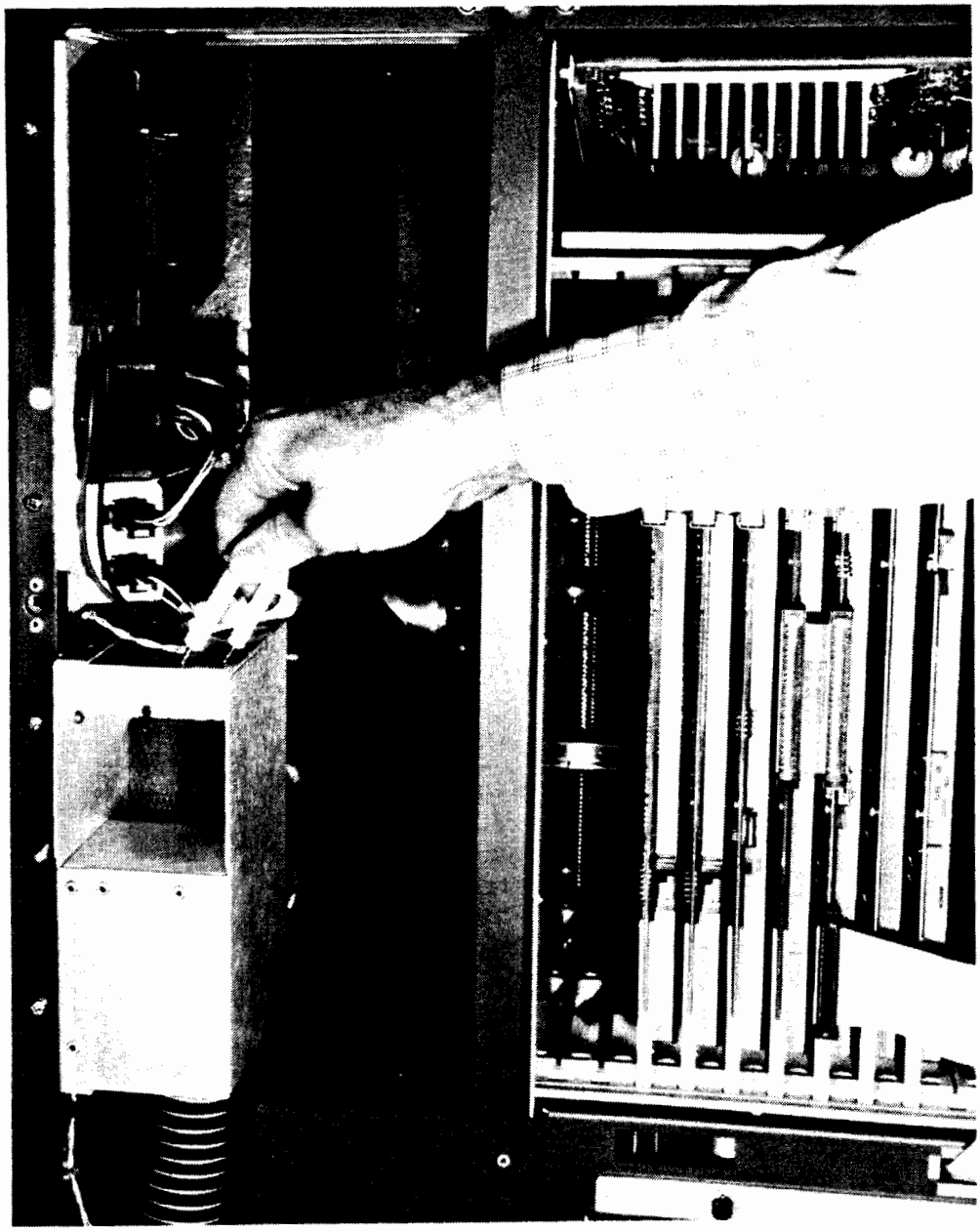
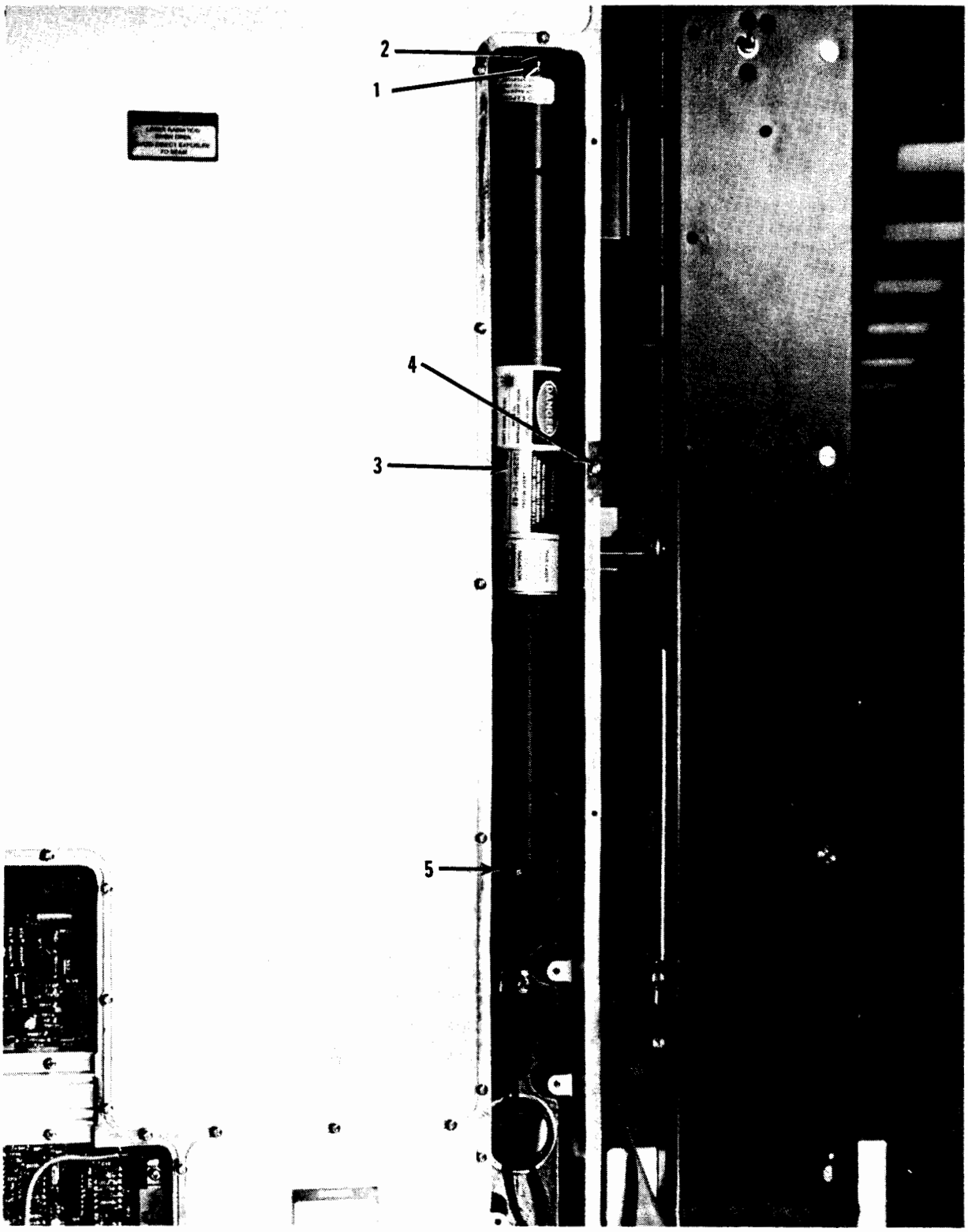


Figure 4-63. Discharging the High Voltage Cable.

I. Loosen the holddown bracket(s) (see Figure 4-64) which secures the laser to the optics casting.



1. Beam stop switch
2. Gasket
3. Laser
4. Hold down bracket
5. Mounting bracket

Figure 4-64. Laser Assembly.

J. Loosen the mounting bracket located at the base of the laser (see Figure 4-64), and slide the bracket down.

K. Remove the holddown bracket(s) which secures the laser and remove the laser.

To install the laser, reverse the removal procedure. Ensure the laser is securely positioned against the machined protrusions (see Figure 4-64) on the optics casting and ensure that the gasket at the top of the laser is compressed. The beam stop switch must face outward.

NOTE

If the laser is correctly installed, it is impossible to insert a piece of paper between the machined protrusions of the optics casting and the laser.

4-32. LASER POWER SUPPLY ASSEMBLY REPLACEMENT

To replace the laser power supply, the line filter, or both, proceed as follows:

WARNING

Hazardous voltages may be encountered if this procedure is not followed correctly.

A. Set the rear MAIN POWER breaker to OFF.

B. Open the printer front door.

C. Remove the printer rear panel.

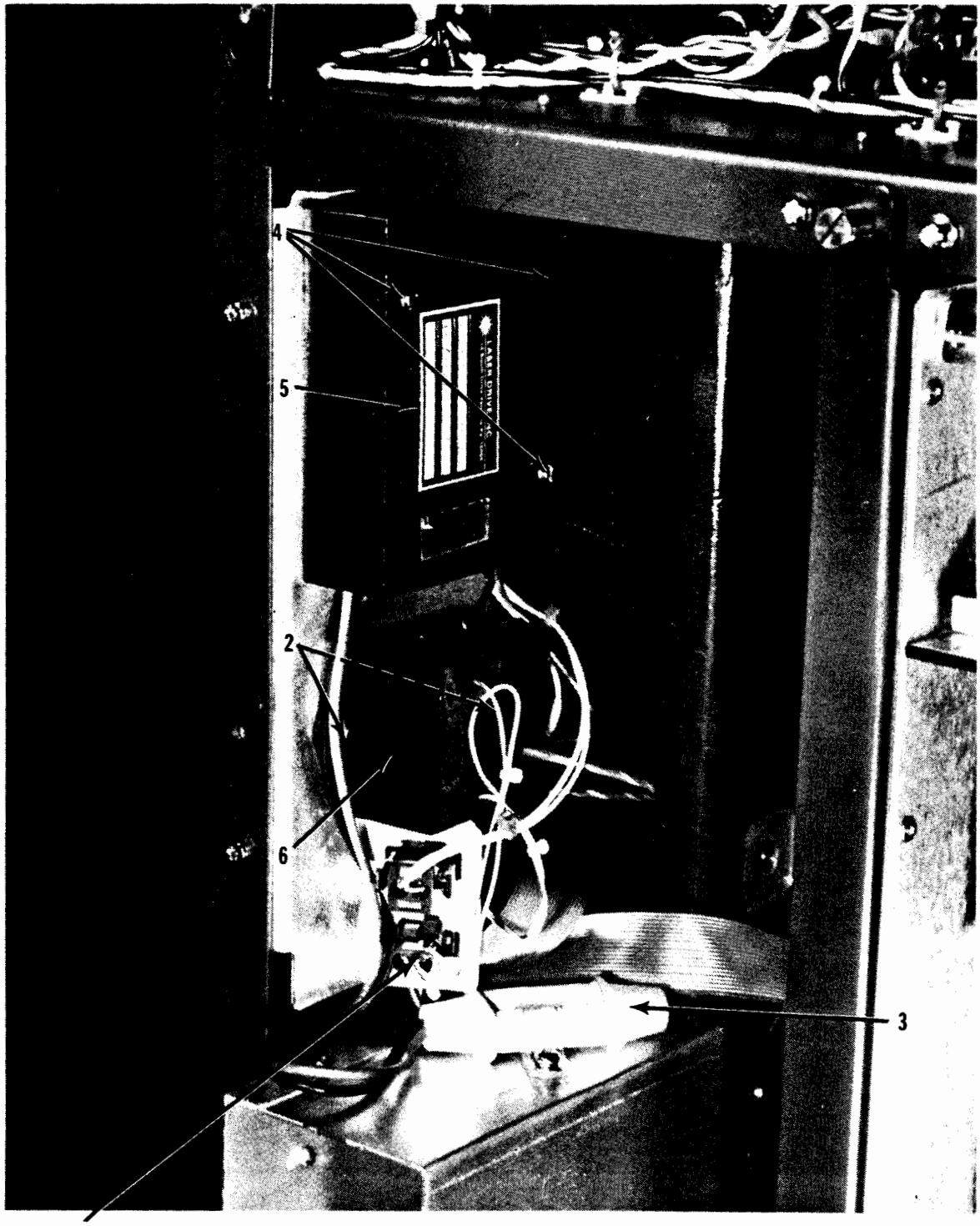
D. Remove the printer's right side outer panel. Two quarter turn fasteners are located on the inside of the end rails. The front fastener is located behind the toner hopper, and the rear fastener is exposed when the rear panel is removed.

E. Disconnect the laser high voltage cable (see Figure 4-65). Momentarily short the exposed contacts of the high voltage cable together against the side of the optics casting to avoid a potential shock hazard (see Figure 4-63).

F. Remove the two screws which secure the two laser power supply grounding wires to the printer frame (one ground for the power supply and one ground for the filter). These screws are easily accessed from the right side of the printer.

G. Remove the one screw which secures the high voltage cable female connector to the muffler bracket.

H. To remove the line filter, disconnect the input connector to the power supply's line filter (see Figure 4-65). Remove the two screws which secure the line filter to the frame.



1. Input to line filter
2. Remove 2 line filter screws
3. Laser High voltage cable
4. Remove 3 power supply screws
5. Laser power supply
6. Line filter

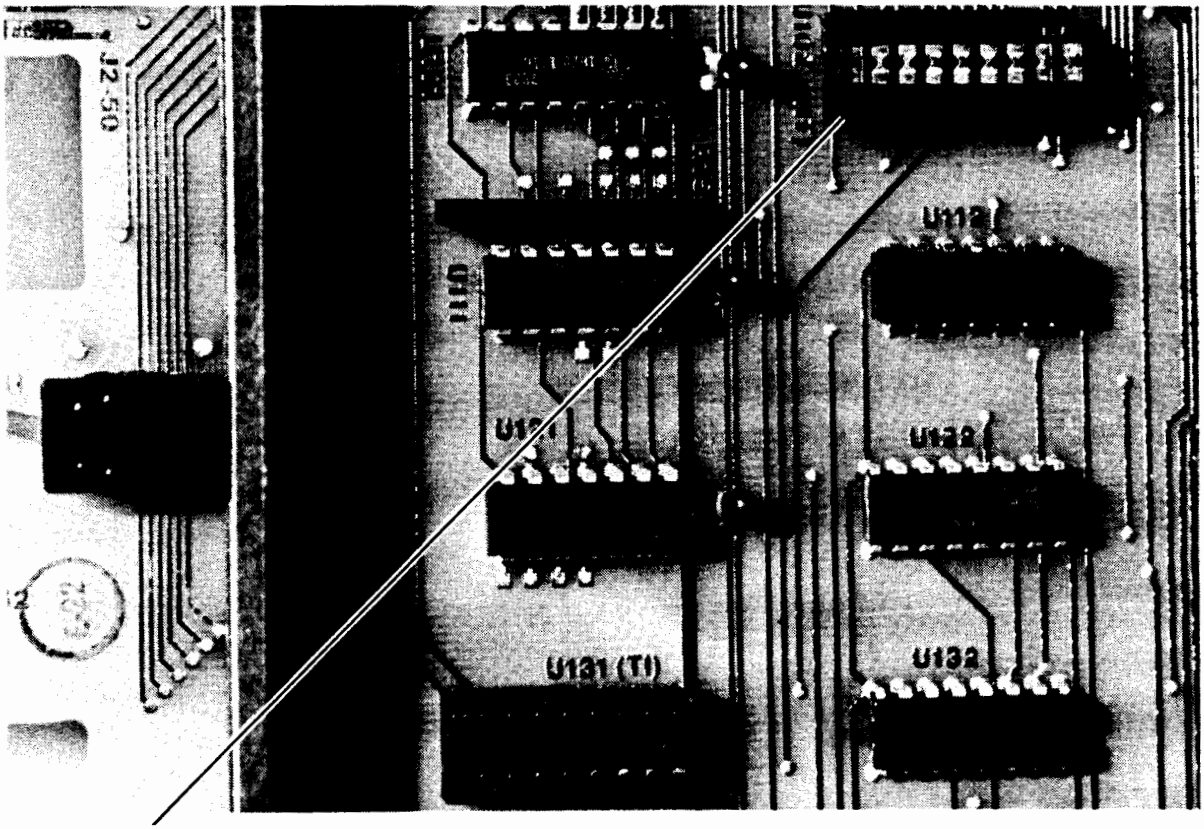
Figure 4-65. Laser Power Supply.

I. To replace the laser power supply, remove the three cross-hatched screws which secure the laser power supply to the printer frame and remove the power supply (see Figure 4-65).

To install laser power supply assemblies, reverse the procedure listed above.

4-33. MACHINE CONTROL PROCESSOR (MCP) PCA ADJUSTMENT

The Machine Control Processor (MCP) PCA may require adjustment if the installed Erasable Programmable Read Only Memory (EPROM) components are replaced. Also, a failure of the Non-Volatile RAM (NVR) or replacement of this PCA requires that the NVR initialization procedure be performed. To initialize NVR, refer to the NVR Initialization Procedure in this section of the manual. On PCA's with a date code less than 2414, the jumper shown in Figure 4-66 was used.



1. Jumper

Figure 4-66. Machine Control Processor PCA.

4-34. MEMORY ARRAY CONFIGURATION

The 2680A can support two memory PCAs; total memory installed in the printer may range from 0.25 to 2.00 Megabyte. It is important that the memory selector switch (at the base of the PCA) is set to the correct position so that all possible memory may be utilized. Refer to Table 4-2 to verify that the memory switch position(s) match the memory configuration of the printer.

Table 4-2 DCS Main Memory Configurations

CARDCAGE POSITION 3			CARDCAGE POSITION 4		
Memory PCA	Switch Position	Range	Memory PCA	Switch Position	Range
---			256 Kbyte	0	(0000-1FFF)
256 Kbyte	1	(2000-3FFF)	256 Kbyte	0	(0000-1FFF)
---			1 Megabyte	0	(0000-1FFF)
1 Megabyte	0	(0000-1FFF)	256 Kbyte	4	(8000-9FFF)
1 Megabyte	1	(2000-3FFF)	1 Megabyte	0	(0000-1FFF)

4-35. MISFOLD DETECTOR ADJUSTMENT

The misfold detector must be checked periodically to ensure that the printer can detect improper stacking of paper and paper jams at the output. To check and adjust the detector, proceed as follows:

EQUIPMENT NEEDED

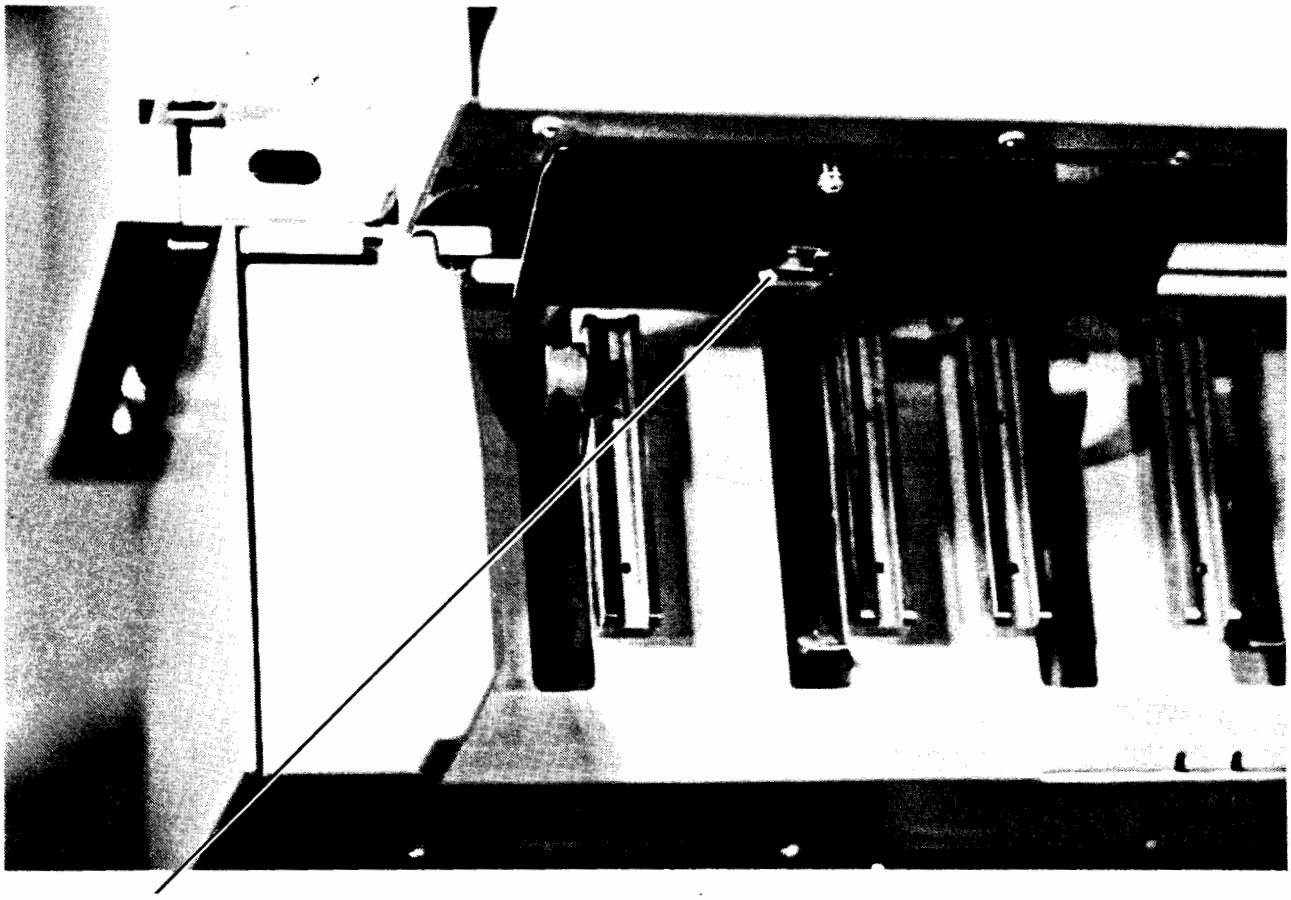
- Paper Misfold Sensor Adjustment Tool (HP part number 02682-20503)
- Jumper

ADJUSTMENT

A. The printer must be ON, but not operating (HALT mode).

B. Remove the printer rear panel.

C. Open the PAMM door, clip the adjustment tool to the deflector shield so that the sensor is pointed at the close target of the tool.

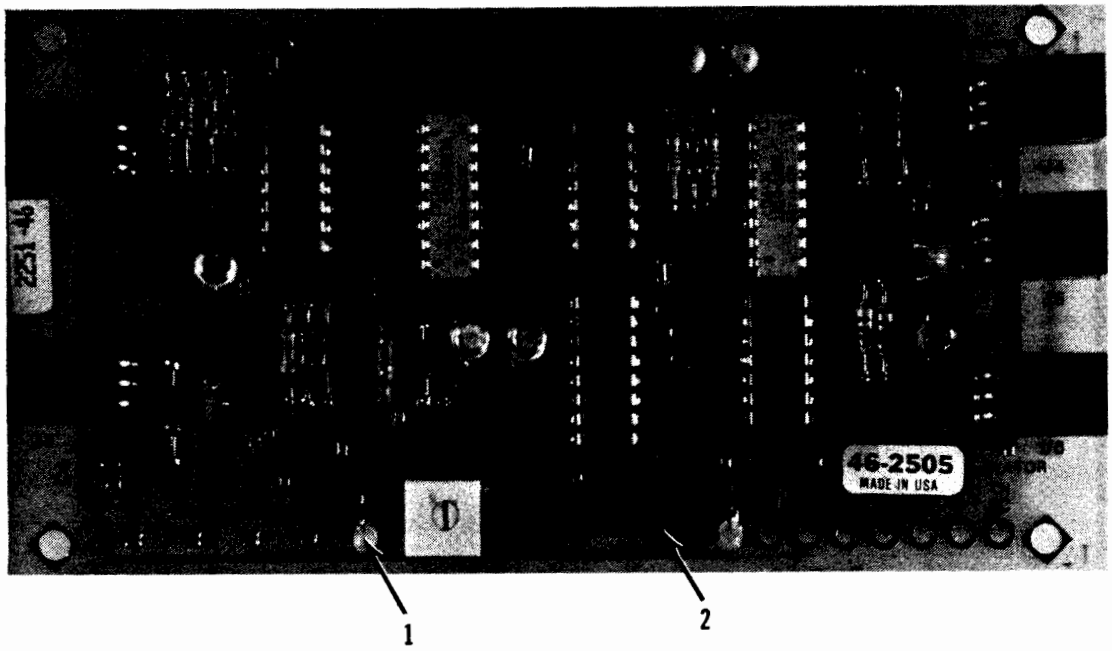


1. Paper misfold detector

Figure 4-67. Stack Misfold Detector.

D. Locate the stack misfold LED "SM" and potentiometer R2 "STK MSF" (see Figure 4-68).

E. On Sensor PCA's with a date code of 2251 or greater, connect a jumper between TP-11 "Tens in" and TP-8 "+5V".



1. Stack misfold LED "SM"
2. "STK MSF" potentiometer R2

Figure 4-68. Sensor PCA.

F. Rotate R2 counterclockwise until stack misfold LED illuminates.

G. Rotate R2 slowly clockwise just until stack misfold LED extinguishes and then rotate the potentiometer clockwise 45 degrees further.

H. Verify misfold detector adjustment as follows:

1. Slide the adjustment tool so that the sensor is pointed at the distance target; verify that the LED illuminates.

2. Slide the adjustment tool so that the sensor is pointed at the close target; verify that the LED is extinguished.

NOTE

After performing this adjustment, if the misfold detector is too sensitive, adjust R2 slightly counterclockwise; if not sensitive enough, adjust R2 slightly clockwise.

I. Install the printer rear panel.

J. Return the printer to normal operation.

4-36. MONITOR PCA ADJUSTMENT

Replacement of the Monitor PCA requires that the Densitometer Offset and the Densitometer Gain be adjusted, refer to the Densitometer PCA adjustment procedure (section 4-12).

4-37. NON-VOLATILE RAM INITIALIZATION PROCEDURE

The HP 2680A Printer has 1 Kbyte of battery-powered RAM which stores non-volatile information. In case of a Non-Volatile RAM (NVR) failure, or replacement of the Machine Control Processor (MCP) PCA, the NVR must be initialized to set selectable operating parameters. To initialize NVR, proceed as follows:

A. Obtain a copy of the last RELIABLE Self Test printout.

B. Open the printer front door and record the count registered on the mechanical drum rotation counter; close the front door.

C. After replacing the non-volatile RAM components or the MCP PCA, enable power to the printer.

D. Press 631, ENTER, 2680, ENTER on the Service Control Panel to enter the service access mode.

E. Press 601, ENTER to start the initialization program. The "**Initialize NVR? 1=yes**" message will be displayed. Press 1, ENTER to continue; any other key sequence aborts the program leaving the NVR unchanged. At this time the default values are loaded into NVR.

F. The printer automatically enters the Input Stepper Registration Mode at this time; press RUN on the Operator Control Panel until the page perforation is aligned to any Top of Form alignment mark (one-half inch increment). Press HALT when alignment is complete.

G. Using a copy of the last RELIABLE Self Test printout and the drum rotation count obtained in step B, enter the following parameters in response to the prompts displayed on the printer. DO NOT press ENTER when entering the following parameters.

   1. Number of rotations, in thousands, since the last preventive maintenance (PM).

   2. Number of rotations, in thousands, since the drum was changed.

   3. Number of rotations, in thousands, since the developer mixture was replaced.

   4. Drum counter (present mechanical counter count).

NOTE

If ENTER is pressed in response to any of these prompts, a zero is stored for that parameter.

NOTE

If the "Invalid step position" message is displayed, the stepper encoder must be realigned. See the Input Stepper Registration Alignment, section 4-28.

H. Use the PAPER FORWARD key to align paper to Top Of Form.

I. Ensure that the coronas are cleaned; if cleaned, press 1, ENTER to clear the display.

J. Ensure that the disposal bottle is NOT full or ALMOST full. Press 1, ENTER to clear the display.

K. Perform Service Tool Command 622 (Calibrate Laser Power).

L. Press 630, ENTER to exit service access mode.

M. Press 1, ENTER, RUN to execute the printer Self Test. Compare the various process settings listed in the self test with the process settings from the last RELIABLE Self Test printout before the NVR failure. If any of the new self test settings vary from the old settings, use the 3XX sequence to change the process settings to match those of the old Self Test. Following is a list of parameters which should be compared:

Machine ID# (See ID label by the courtesy lamps)
Drum count (See mechanical counter)
Krtn on drum
Krtn on dvlp
Light target
Dark target
Cln drum intv
Prim. setting
Simul setting
Right registr
Up registr
Start tension
Run tension
Stop tension
PM int (KRtn)

N. Verify that First Order Power (FOP) is between 90 and 110 counts.

4-38. OPTICS CASTING REPLACEMENT

To remove the optics casting, proceed as follows:

WARNING

Set the rear MAIN POWER breaker to OFF. Hazardous voltages and laser light may be encountered if this procedure is not followed. The laser tube may be hot.

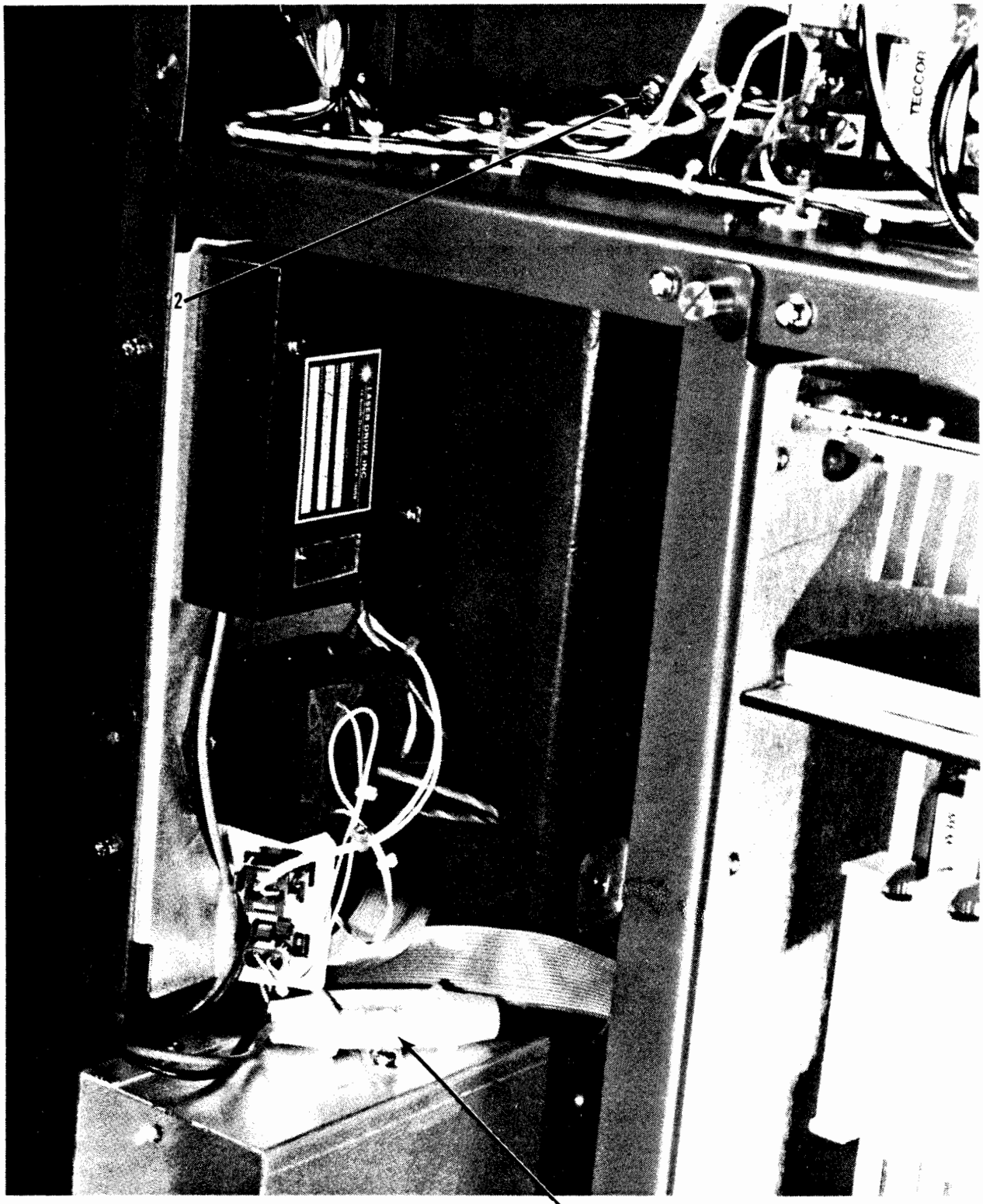
A. Set the rear MAIN POWER breaker to OFF.

B. Raise the printer top cover.

C. Remove the printer rear panel.

D. Remove the printer's right side outer panel. Two quarter turn fasteners are located on the inside of the end rails. The front fastener is located behind the toner hopper, and the rear fastener is exposed whenever the rear panel is removed.

E. Disconnect the laser high voltage cable connector (see Figure 69).



1. Laser high voltage cable
2. Lower mounting foot screw

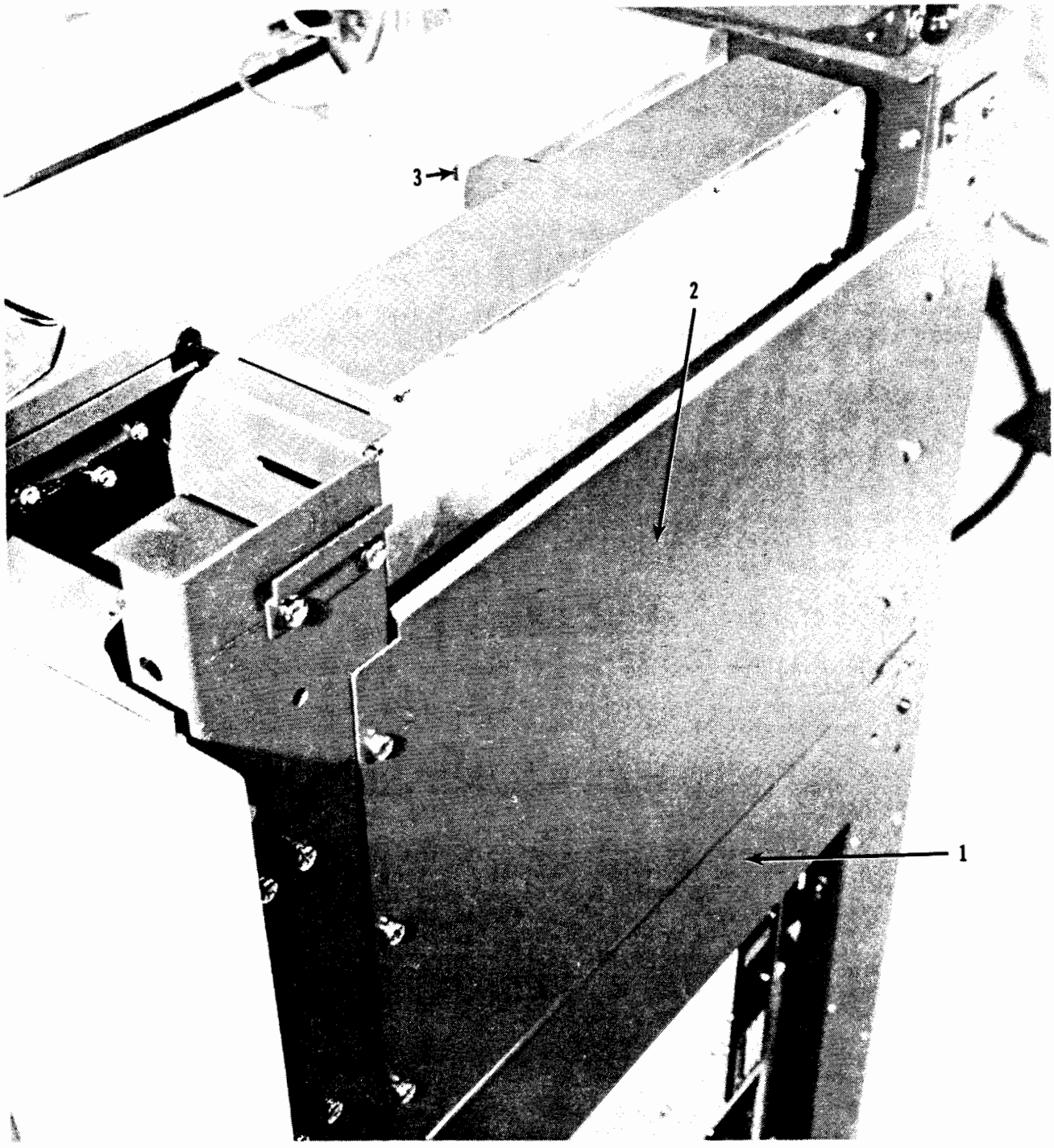
Figure 4-69. Laser Power Supply and Optics Mounting Foot Screw.

F. Remove the screw which secures the optics casting lower mounting foot.

G. Disconnect the ribbon cable from the scanner motor (located behind the optics casting) and the optics casting PCA (located below the frame brace) using the finger loops on the connectors.

H. Remove the EP interior closeout panel (this panel supports the empty toner bag).

I. Remove the frame brace (see Figure 4-70) as follows:



1. Frame brace
2. Castings cover
3. Upper mounting foot screw

Figure 4-70. Optics Frame Brace and Casting Cover.

1. Prior to removal, mark the frame brace to identify orientation (so as not to invert brace on re-assembly).

2. Using a cross-tipped screwdriver, remove the two screws which secure the brace to the printer frame.

3. Pull off both ends of the frame brace at the same time.

NOTE

If any of the alignment pins come loose from the frame, re-install the pins into the brace before installing the brace to the frame.

J. Loosen the upper mounting foot screw which is located on the top-center of the inboard side of the optics casting (Figure 4-70).

WARNING

The optics casting weighs approximately 25 kg (45 pounds) and must be handled carefully to avoid dropping it and possibly causing personal injury. Also, damage to the optics or alteration of critical adjustments in the optics may result.

CAUTION

The optics casting should rest on a flat surface, with the scanner motor down, when removed from the printer. Use a thick foam pad to rest the casting on.

K. Remove the optics casting from the printer by lifting straight up about 40 mm (1.5 inches), then pull away from the frame until the scanner motor clears the frame.

When installing an optics casting in the printer, hook the top mounting foot over the round bar at the top of the frame. Let the casting rest there until you are ready to lift the lower mounting feet up and over the lower round bar. After properly seating the casting, slide it as far to the rear of the printer as it will go. Ensure that the beam stop shown in Figure 4-61, section 4-31, is opened (screw in, or slide switch to the left). Reverse the procedures in step B through step K to replace the optics casting, with the exception that you should install the screw which secures the optics casting lower mounting foot before tightening the top mounting foot cap screw.

4-39. OPTICS PCA REPLACEMENT

To remove the Optics PCA, proceed as follows:

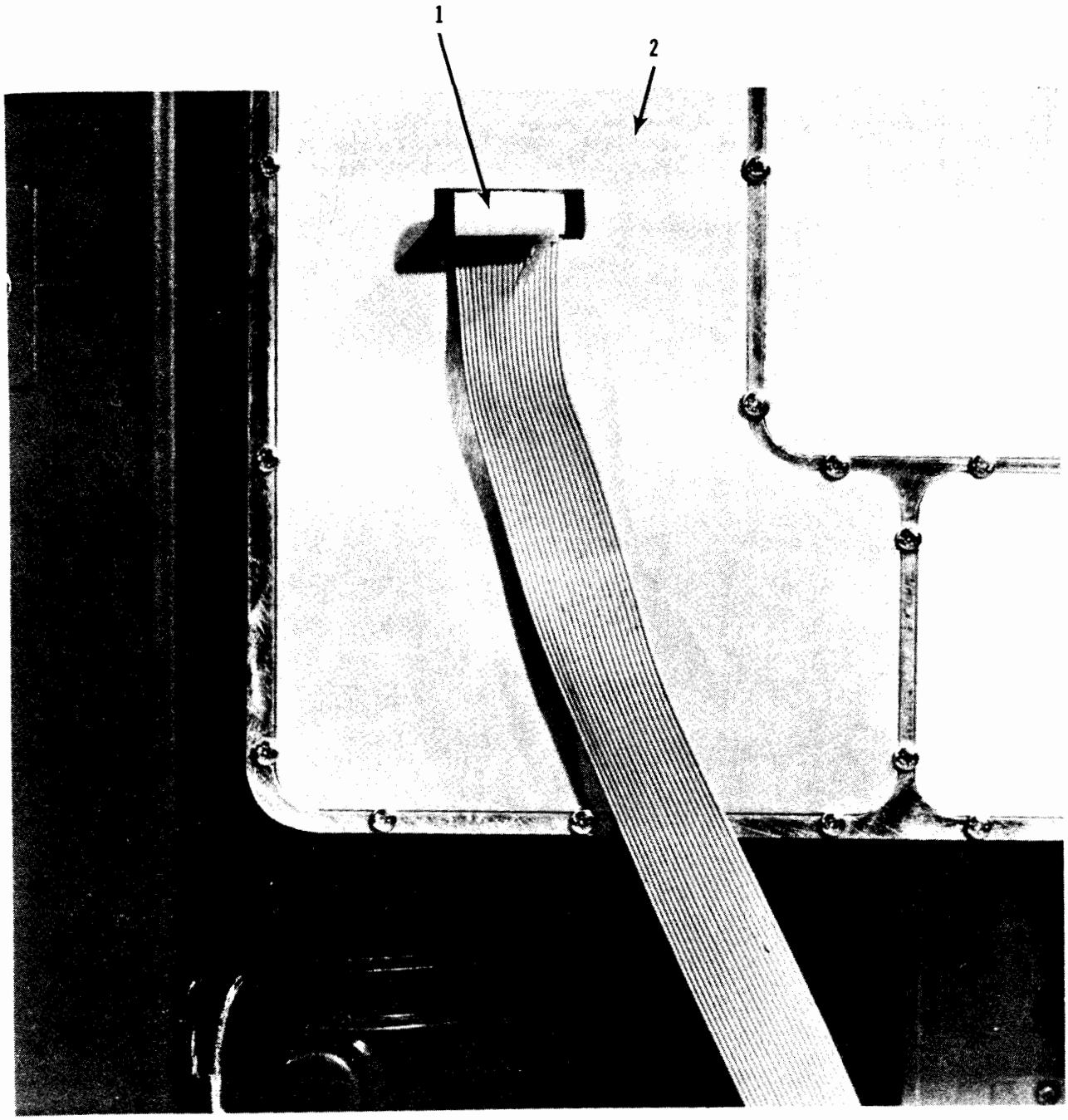
A. Set the rear MAIN POWER breaker to OFF.

B. Open the printer front door.

C. Remove the printer rear panel.

D. Remove the printer's right side outer panel. Two quarter turn fasteners are located on the inside of the end rails. The front fastener is located behind the toner hopper, and the rear fastener is exposed whenever the rear panel is removed.

E. Disconnect the Optic's PCA ribbon cable (see Figure 4-71).



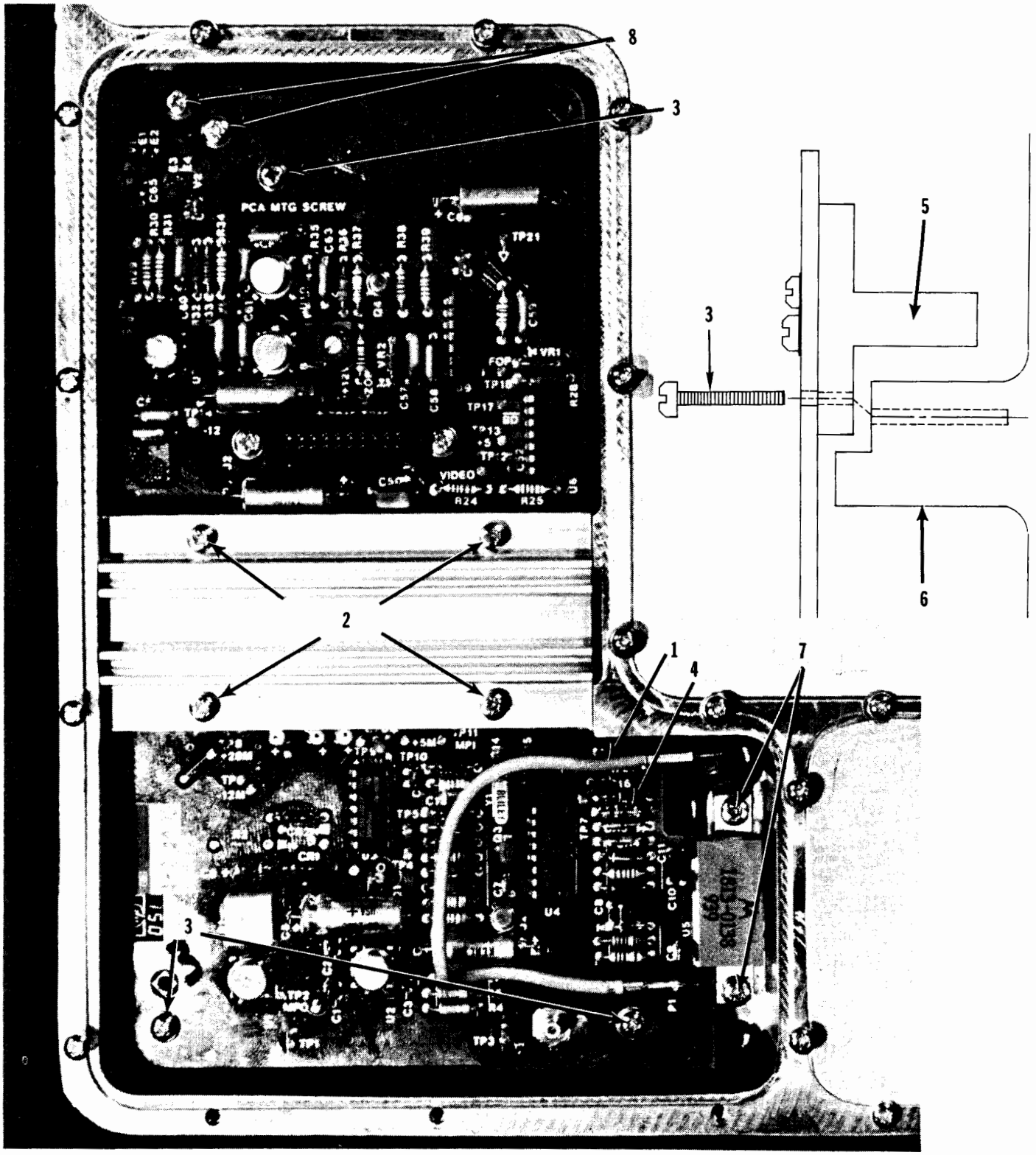
1. Optics PCA ribbon connector
2. Optics PCA cover

Figure 4-71. Optics Area.

F. Remove the Optics PCA cover by loosening the fifteen cross-hatched screws which secure the cover to the optics casting.

G. Remove the two screws which secure the Optic PCA's RF amplifier and remove the amplifier, see Figure 4-72.

H. Disconnect the Optic PCA's RF coaxial cable, see Figure 72. Needle-nose pliers may be required to remove this cable.



1. RF Coaxial cable
2. RF filter cover screws
3. Remove 3 screws
4. Optics PCA
5. Detector mount
6. Reference ledge
7. Remove 2 RF screws
8. DO NOT remove

Figure 4-72. Optics PCA.

I. Remove the four screws which secure the Optic PCA's RF filter cover and remove the filter cover, see Figure 4-72.

J. Remove the three screws (callout #3 in Figure 4-72) which secure the Optics PCA to the optics casting and remove the PCA from the casting.

K. Install the Optics PCA in the optics casting by reversing steps G through J from the removal procedure. Ensure the Optics PCA is properly seated in the optics casting. When properly installed, the PCA is positioned with the detector mount firmly against the reference ledge, towards the lower right-hand corner of the optics casting (see insert in Figure 4-72).

L. Install the Optic PCA ribbon cable removed in step E of the removal procedure.

M. Re-install the printer side cover.

N. Restore printer power by placing the rear MAIN POWER breaker to ON.

O. Initiate the printer Self Test. Compare the self test parameters listed on the diagnostic print-out with those of a previous successful self test print-out from the maintenance log.

4-40. PAPER-OUT SENSOR ADJUSTMENT

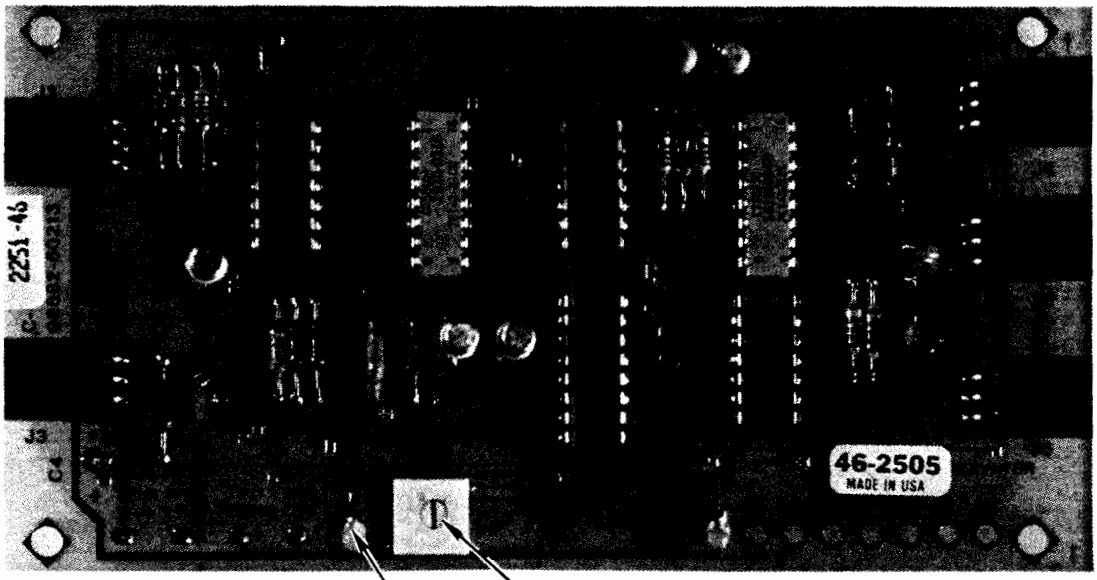
The paper-out sensor may lose sensitivity with age and should be adjusted if the printer fails to properly detect an out of paper condition, or if the sensor is replaced. To adjust the sensor, proceed as follows:

A. Before adjusting, try cleaning the paper-out sensor window with lens tissue and isopropyl alcohol.

B. The printer must be ON, but not operating (HALT mode).

C. Remove the printer rear panel.

D. Locate the Paper-Out LED "IN" and potentiometer R9 "PAP IN" (see Figure 4-73).



1. Paper-out LED (IN)
2. Potentiometer R9 (PAP IN)

Figure 4-73. Sensor PCA.

E. Rotate potentiometer R9 "PAP IN" fully counterclockwise.

F. Remove paper from the area around the paper-out sensor. At this time, the "IN" LED should illuminate.

G. Rotate potentiometer R9 clockwise just until the paper-out LED extinguishes or R9 is fully rotated. NOTE THIS POSITION.

H. Load paper in front of the paper-out sensor (the "IN" LED should be extinguished at this time).

I. Rotate R9 counterclockwise just until the paper-out LED illuminates or R9 is fully rotated. NOTE THIS POSITION.

J. Set R9 midway between the two positions noted in step G and step I.

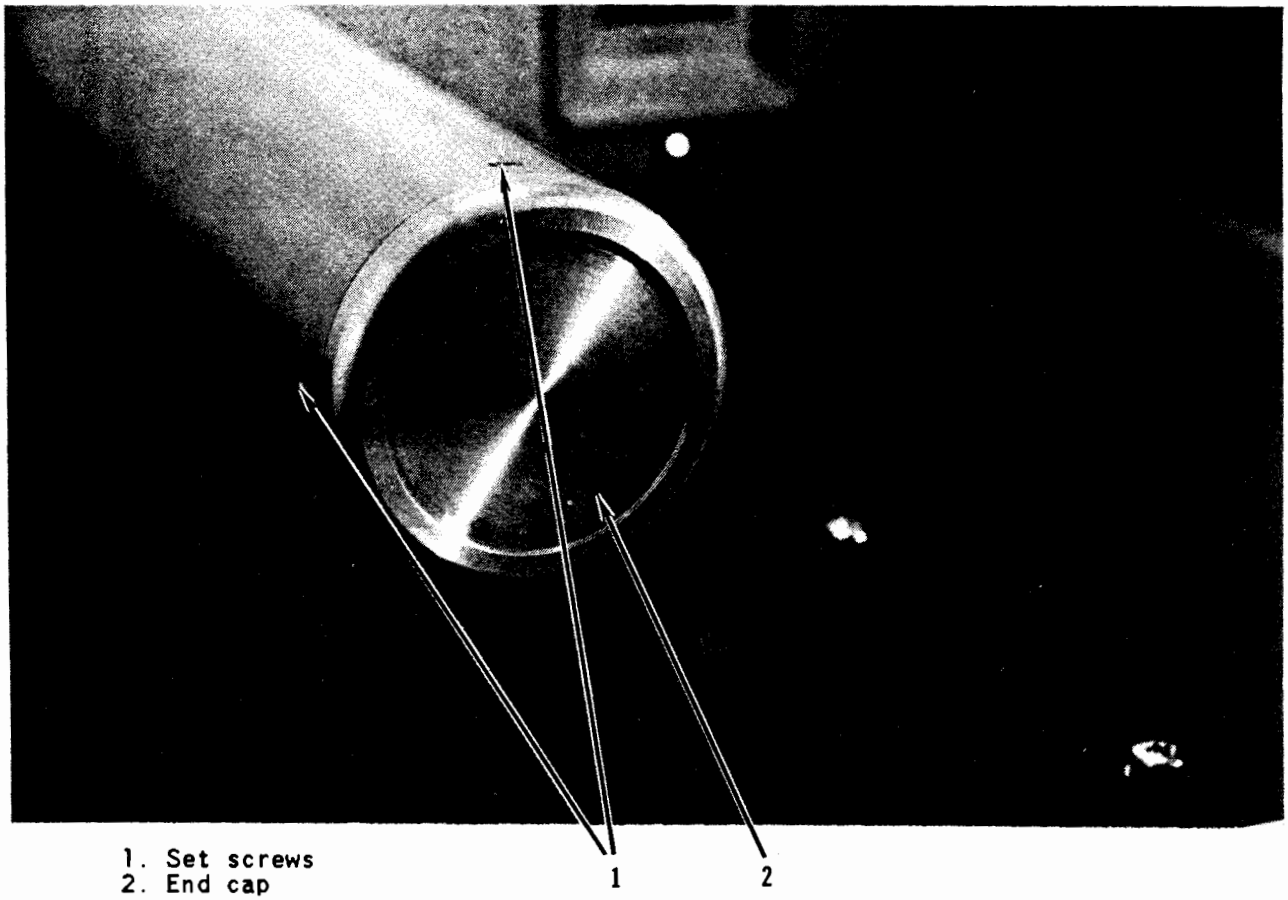
K. Install the printer rear panel and return the printer to normal operation.

4-41. PAPER-OUT SENSOR REPLACEMENT

When replacing the paper-out sensor or window, proceed as follows:

A. Set the rear MAIN POWER breaker to OFF.

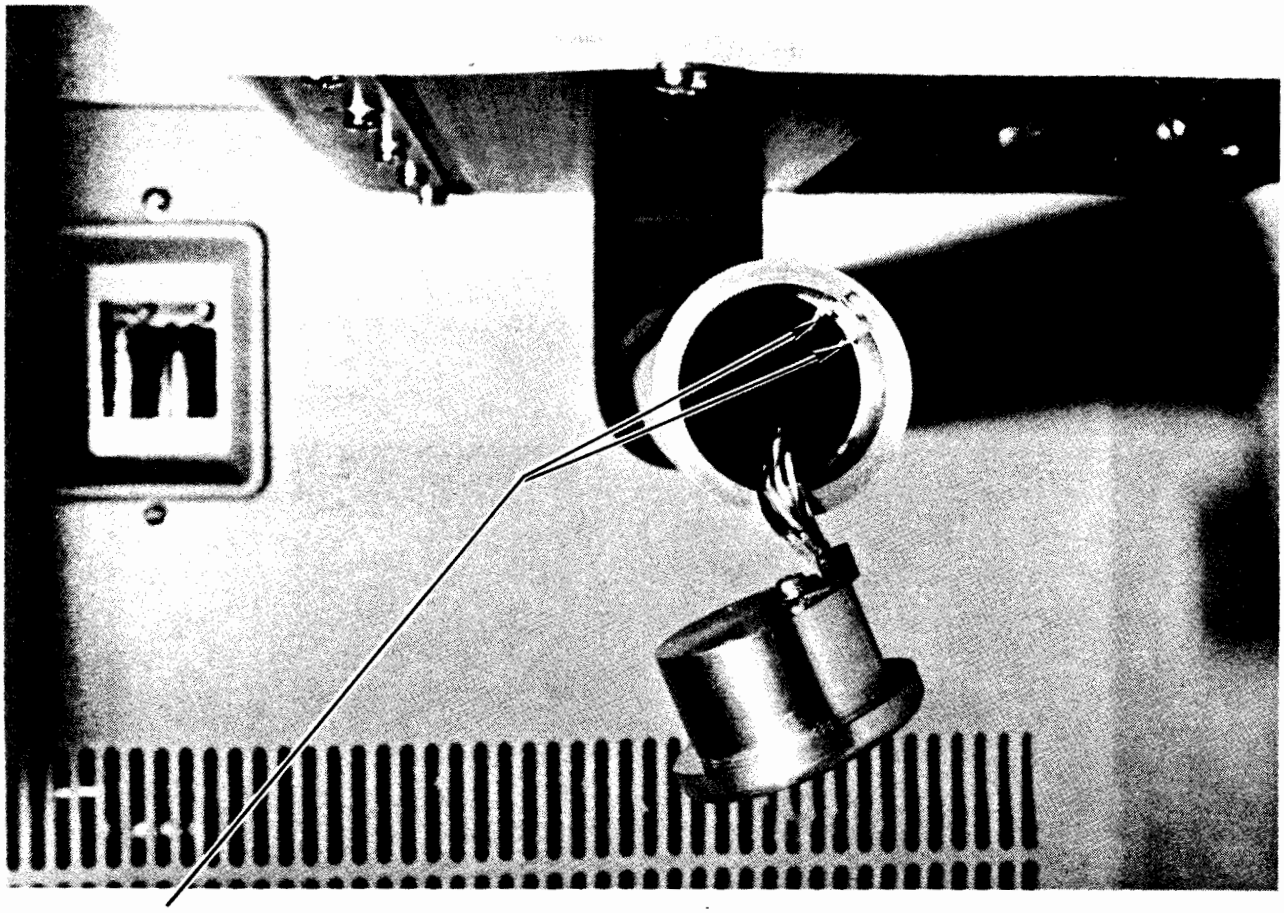
B. Using a 2 mm internal hex driver (allen wrench), loosen the two set screws which secure the end cap to the paper sensor assembly (see Figure 4-74) and carefully remove the end cap. To remove only the window, perform step C; to remove only the sensor, perform step D through step F.



1. Set screws
2. End cap

Figure 4-74. Paper Guide Tube End Cap (bottom view).

C. Squeeze the two legs of the paper-out sensor window together and push the window outward to remove it from the paper sensor assembly (see Figure 4-75).



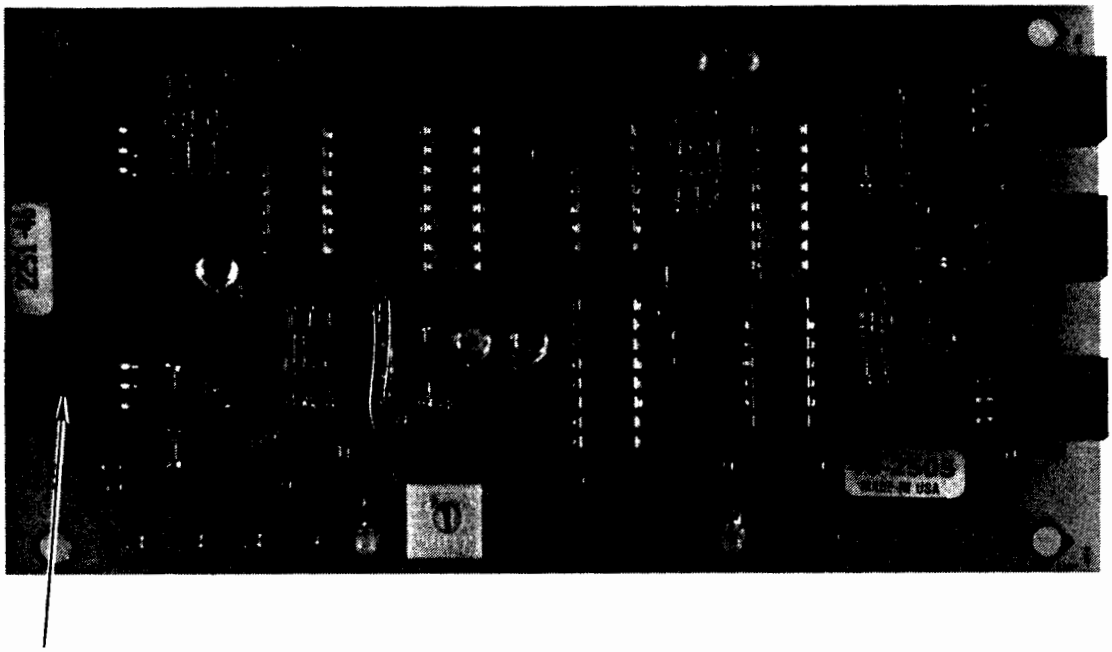
1. Sensor window legs

Figure 4-75. Paper-Out Sensor.

D. Disconnect the paper-out sensor near the end of the paper guide tube.

NOTE

It may be necessary to remove the printer rear panel and feed some slack cable from J3 of the Sensor PCA through the back wall of the printer so that the paper-out sensor may be disconnected. (See Figure 4-76)



1. Connector J3

Figure 4-76. Sensor PCA Connectors.

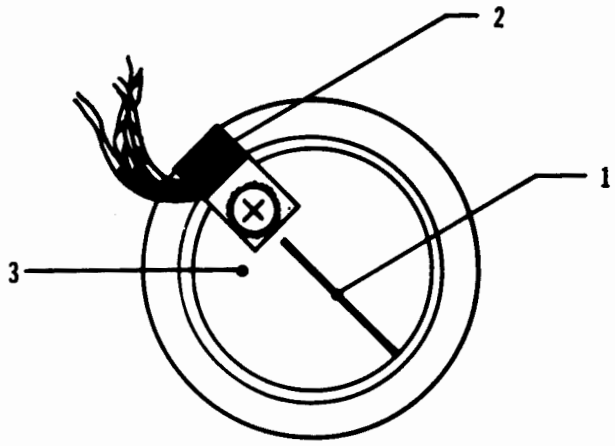
E. Remove the paper-out sensor from the end cap.

To install the paper-out sensor and/or window, proceed as follows:

A. Insert the sensor cable into the paper sensor shaft; retrieve any slack cable at the rear wall of the printer where the Sensor PCA is located.

B. Push the paper-out sensor window into the opening on the paper sensor assembly until it locks in place.

C. Move the legs of the window until the opening between the legs exactly faces the end cap opening (see Figure 4-75).



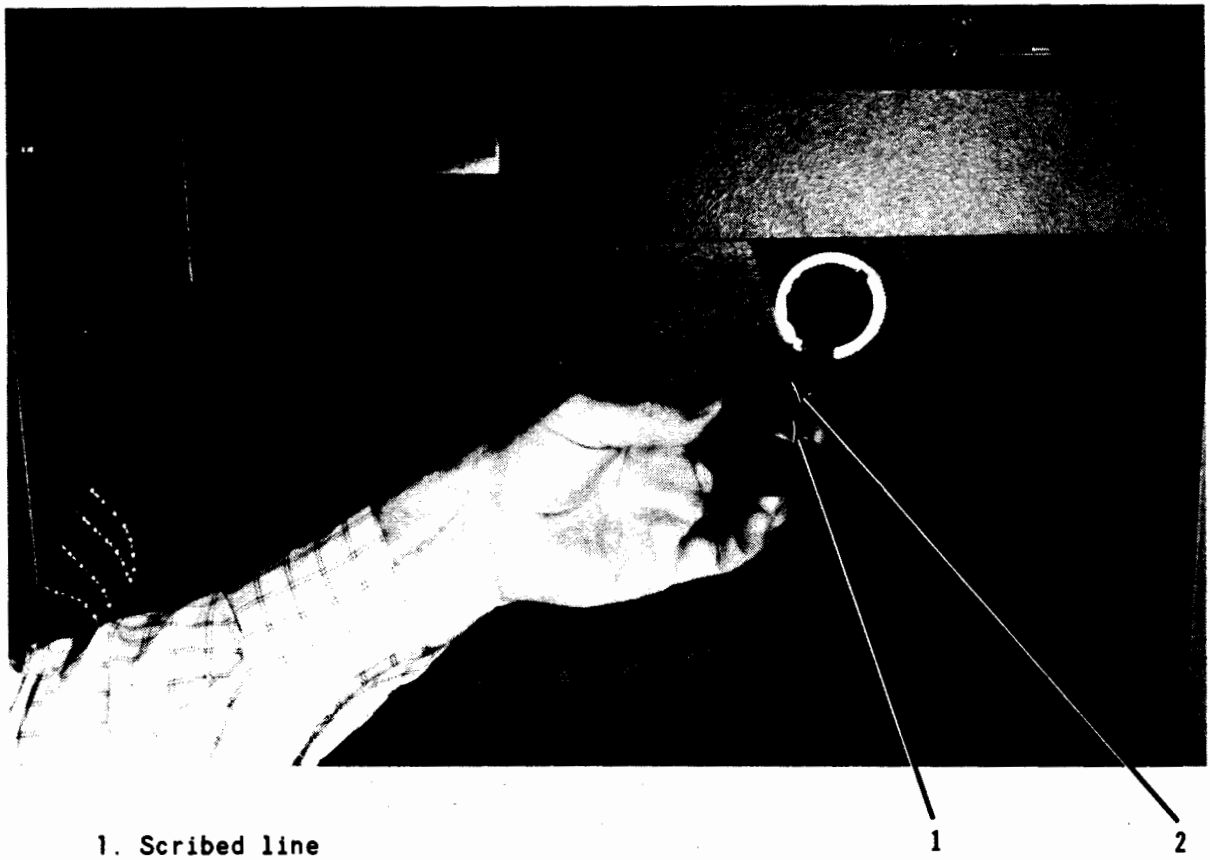
1. Y axis
2. Sensor
3. End cap

Figure 4-77. Paper-Out Sensor/End Cap Alignment.

D. Position the end cap in front of you such that the fastening hole is along the vertical (Y) axis as shown in Figure 4-77.

E. Place the light sensor on the inside of the cap and lightly tighten the screw. You should be able to easily rotate the sensor at this point.

F. Rotate the sensor until the top is centered on the scribed line (see Figure 4-78), then tighten the screw.



1. Scribed line
2. Sensor

Figure 4-78. Paper-Out Sensor/Guide Tube Alignment.

G. Reconnect the paper-out sensor cable.

H. Align the light sensor on the end cap with the opening between the legs of the sensor window. Gently slide the end cap into the opening.

I. Tighten the two set screws which secure the end cap to the paper sensor assembly (see Figure 4-74).

J. Perform the paper-out sensor adjustment as described in this section of the manual.

4-42. PAPER WIDTH SENSOR ADJUSTMENT

The paper width sensor must be properly adjusted to avoid displaying erroneous paper width error messages, and to ensure that the correct number of preheater pads are turned on. The paper width is defined as the distance from the outside edge of one tractor strip to the outside edge of the other tractor strip. To adjust the paper width sensor, proceed as follows:

A. Unload the paper from the printer.

B. Press 1175, ENTER on the Service Control Panel. This allows a continuous reading of the paper width count on the display.

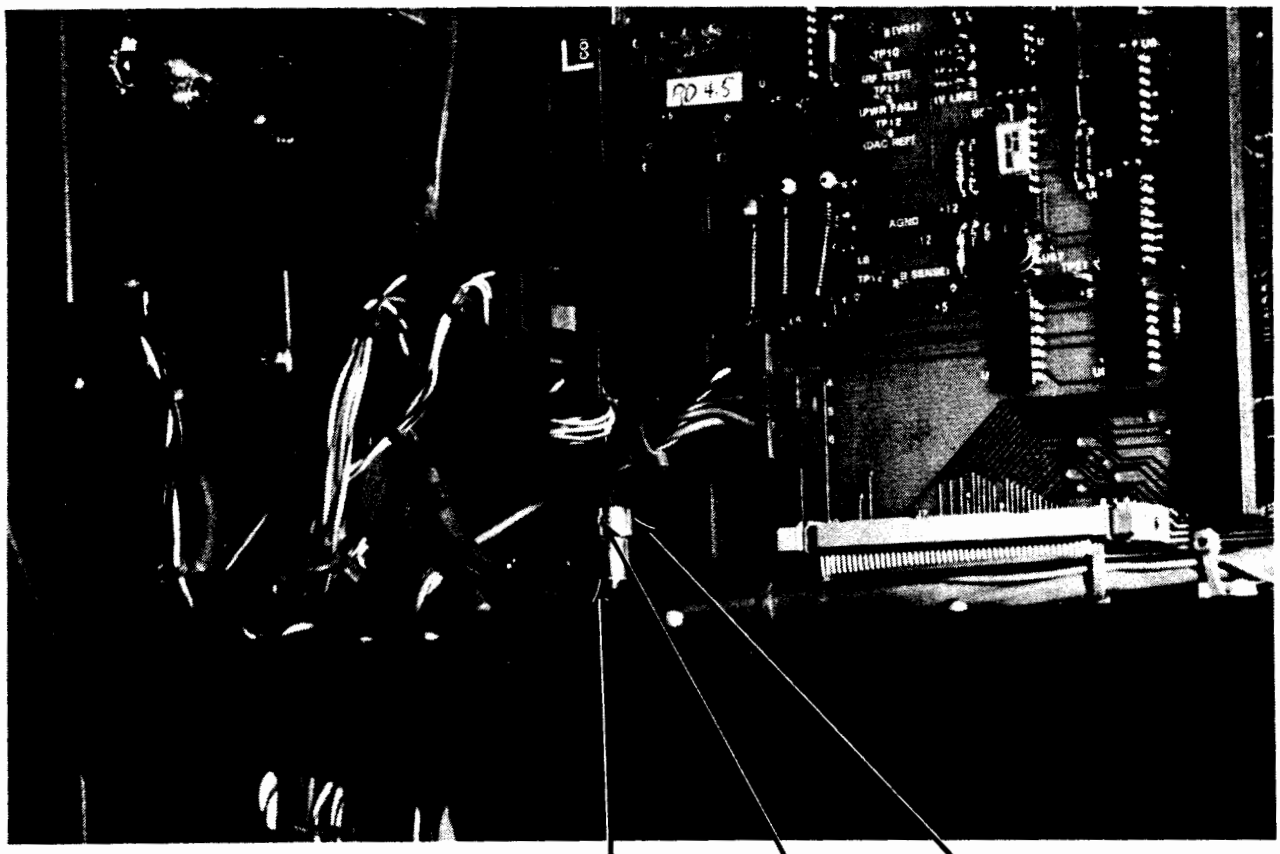
C. Unlock the rear paper input tractor, and move the tractor along the tractor guide shaft until it is firmly positioned against the "E" ring stop; lock the tractor in place.

D. Verify that the display reads 51 counts +/- 1 count. If the display is within this range, proceed to step H. If the display is NOT within this range, proceed to step E.

E. Remove the printer rear panel.

F. Adjust the paper width sensor potentiometer as follows:

1. Turn the paper width sensor collar (see Figure 4-79) clockwise (viewed from the top of the collar) until the sensor set screw faces outward (see Figure 4-79).



1. Paper width sensor collar
2. Sensor set screw
3. Spring

Figure 4-79. Paper Width Sensor.

2. Using a 1.5 mm internal hex head driver (allen wrench), loosen the set screw on the paper width sensor shaft.

3. Lower the paper width sensor collar approximately 3/8 inch. Using needle-nose pliers, rotate the sensor shaft counter-clockwise (as viewed from the top) until the count displayed is greater than 90 counts. Raise the collar.

4. Tighten the set screw loosened in step 2.

5. Rotate the sensor collar clockwise (viewed from the top) until the display reads 51 counts +/- 1 count.

6. Rotate the sensor collar counter-clockwise (viewed from the top) to tighten the spring on the collar.

7. Repeat steps 5 and 6 until the desired count of 51 +/- 1 count is obtained while the spring is tight.

NOTE

If the count goes below the recommended adjustment range when the spring is tight, repeat the adjustment procedure beginning at step 2.

8. At the front of the printer, verify the above adjustment by performing the following steps:

   a. Move the rear input tractor all the way to the rear of the tractor guide shaft and return the tractor to the "E" ring stop.

   b. Lock the tractor in position.

   c. Note the display count. If the adjustment is valid the count should read 51 counts +/- 1 counts.

G. Install the printer rear panel.

H. Press CLEAR on the Service Control Panel to return the printer to its normal display.

I. Load paper and resume normal printing.

Table 4-3 compares some of the variables associated with paper width when paper width sensing is adjusted properly. The paper width count (including tractor strips) can be observed on the display by pressing 175 on the Service Control Panel while in the service command mode.

Table 4-3. Paper Width Variables

Paper Width Range*	Shield Number	Count
Greater than 12.13 in. (308 mm)	-	206 - 255
11.86 to 12.13 in. (301 to 308 mm)	1	198 - 205
11.63 to 11.86 in. (295 to 301 mm)	2	190 - 197
10.5 to 10.75 in. (266 to 273 mm)	3	161 - 170
9.75 to 10 in. (247 to 254 mm)	4	140 - 150
9.38 to 9.63 in. (238 to 244 mm)	5	130 - 139
8.38 to 8.63 in. (212 to 219 mm)	6	105 - 113
6.38 to 6.63 in. (161 to 168 mm)	7	51 - 60

If the size of paper used in the printer (for example, 7 inch paper) is not within the ranges listed in Table 4-3, the "Use custom shield" message is displayed. A custom-made shield must be installed in this situation. If the paper width is greater than 12.125 inches (303 mm) the "Use no shield" message is displayed.

4-43. PRINT CONTROL PCA ADJUSTMENT

The Print Control PCA has one switch, labelled CLOCK, on the outer edge of the PCA. This switch is set to the MOD position during normal operation. The FAST and SLOW positions are used to obtain stable traces on an oscilloscope display when monitoring the following test points:

- BD (Beam Detect) -- a 1.2 microsecond duration pulse every 740 microseconds during normal operation.
- TOP (Top of Page) -- a pulse from the MCP PCA once each physical page (about 1.3 seconds for two 8.5 inch pages). A logic probe is necessary to observe this pulse.
- DATA -- consists of the serial bit stream (the dots to be printed) from the Character Processor PCA.
- VIDEO -- the TTL signal output to the Optics PCA used to control the laser. This signal also transmits the data, the process mark, and the job separation mark.

This PCA usually causes erratic print or no printing if bad.

4-44. PREHEATER ASSEMBLY REPLACEMENT

To remove the preheater assembly, proceed as follows:

WARNING

Ensure that the MAIN POWER Breaker is turned OFF. If the power is not turned off, 220 volts will be applied to the connectors of the fuser bulb.

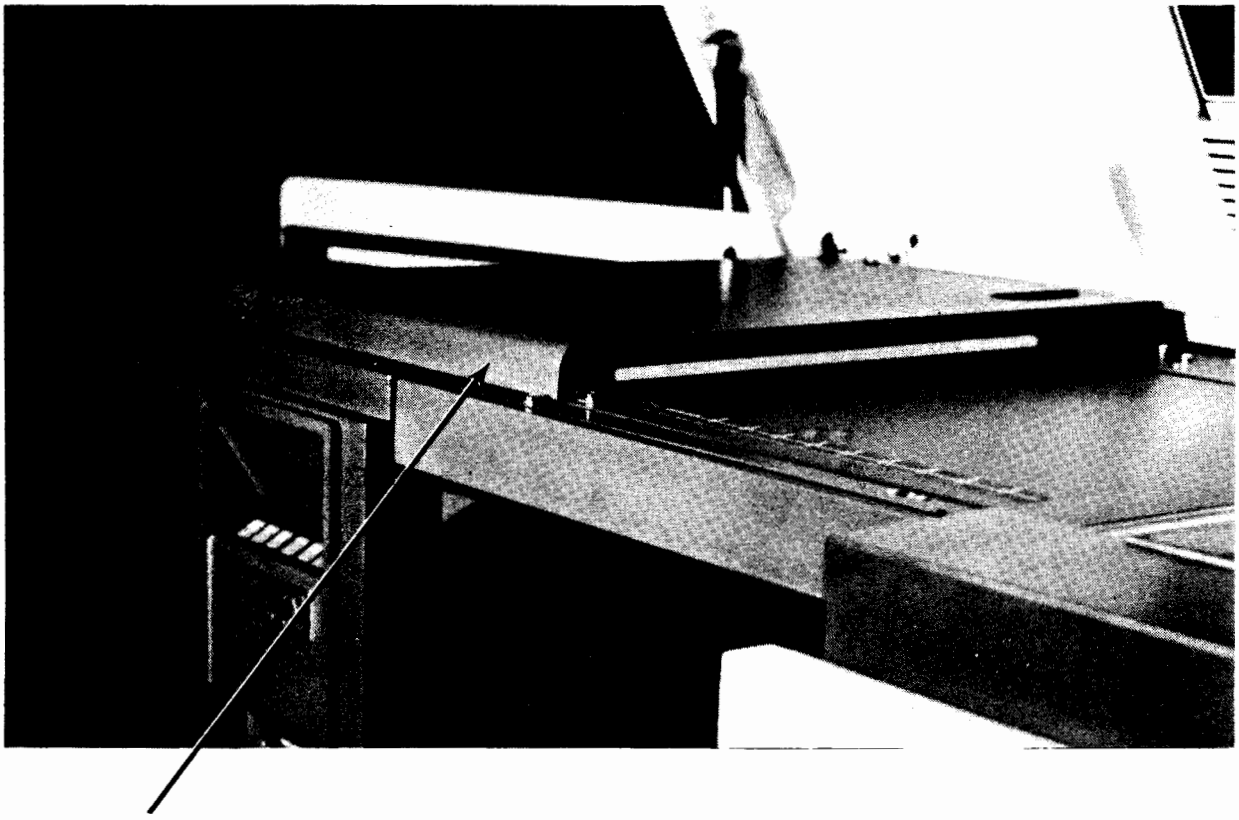
WARNING

If the printer has been operating, or the EJECT SINGLE or EJECT ALL key on the Paper Control Panel has been pressed, allow 30 minutes after the main power switch has been set to OFF before attempting to remove the preheater. Burns will result if the preheater has not been allowed to cool.

A. Set the rear MAIN POWER breaker to OFF, then wait 30 minutes before proceeding.

B. Open the printer top cover.

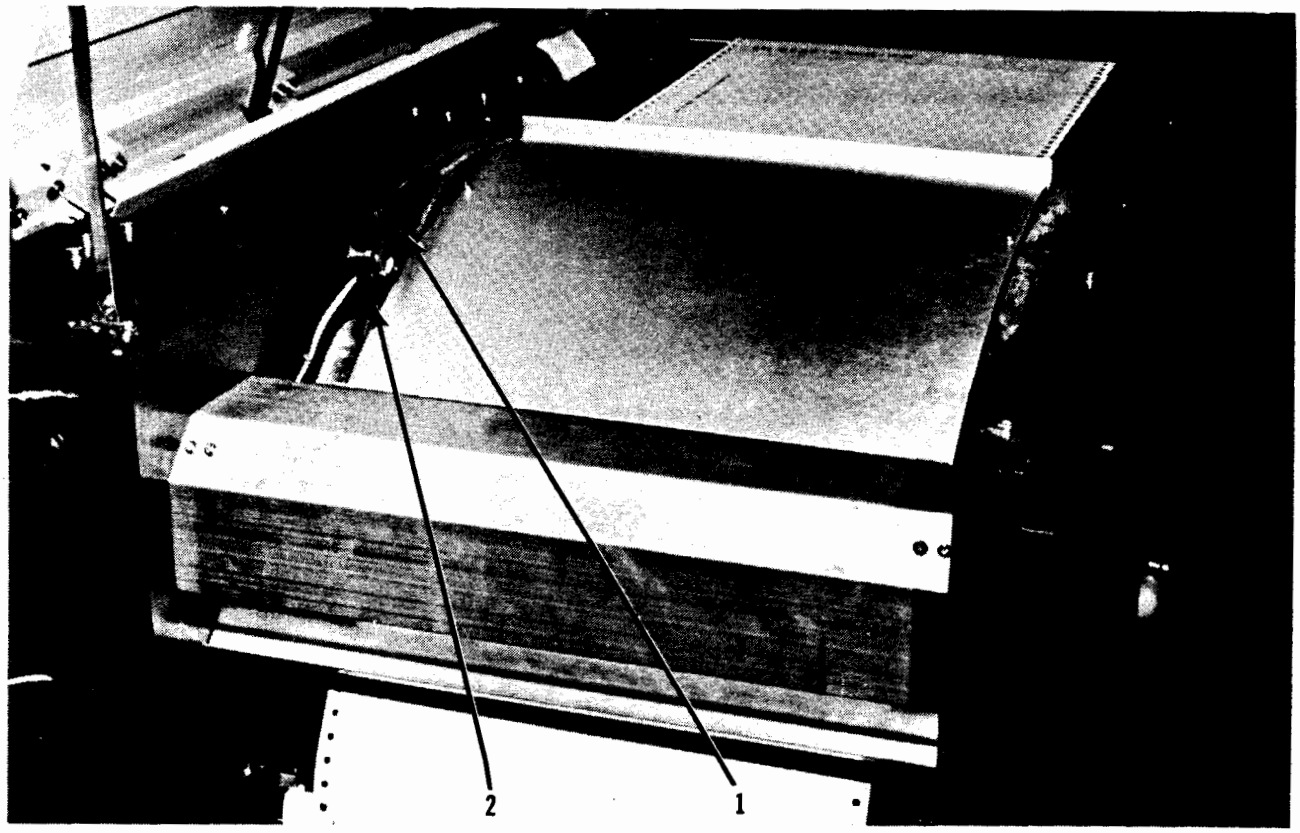
C. Remove the fuser system cover (see Figure 4-80). This cover is secured by four screws.



1. Fuser system cover

Figure 4-80. Fuser System Cover.

D. Remove the ceramic insulation panels from both sides of the preheater to gain access to the mounting screws (see Figure 4-81). It may be necessary to lift the fuser unit to remove the side insulation panel at the rear of the fuser. Remove the bottom left panel by sliding it out from under the fuser assembly.



1. Insulation
2. Flex hose

Figure 4-81. Preheater Insulation Panels (ceramic fiber).

WARNING

The fuser lamp may break during removal. Wear safety goggles and handle the bulb with several disposable wipers to protect your hand in case the lamp does break.

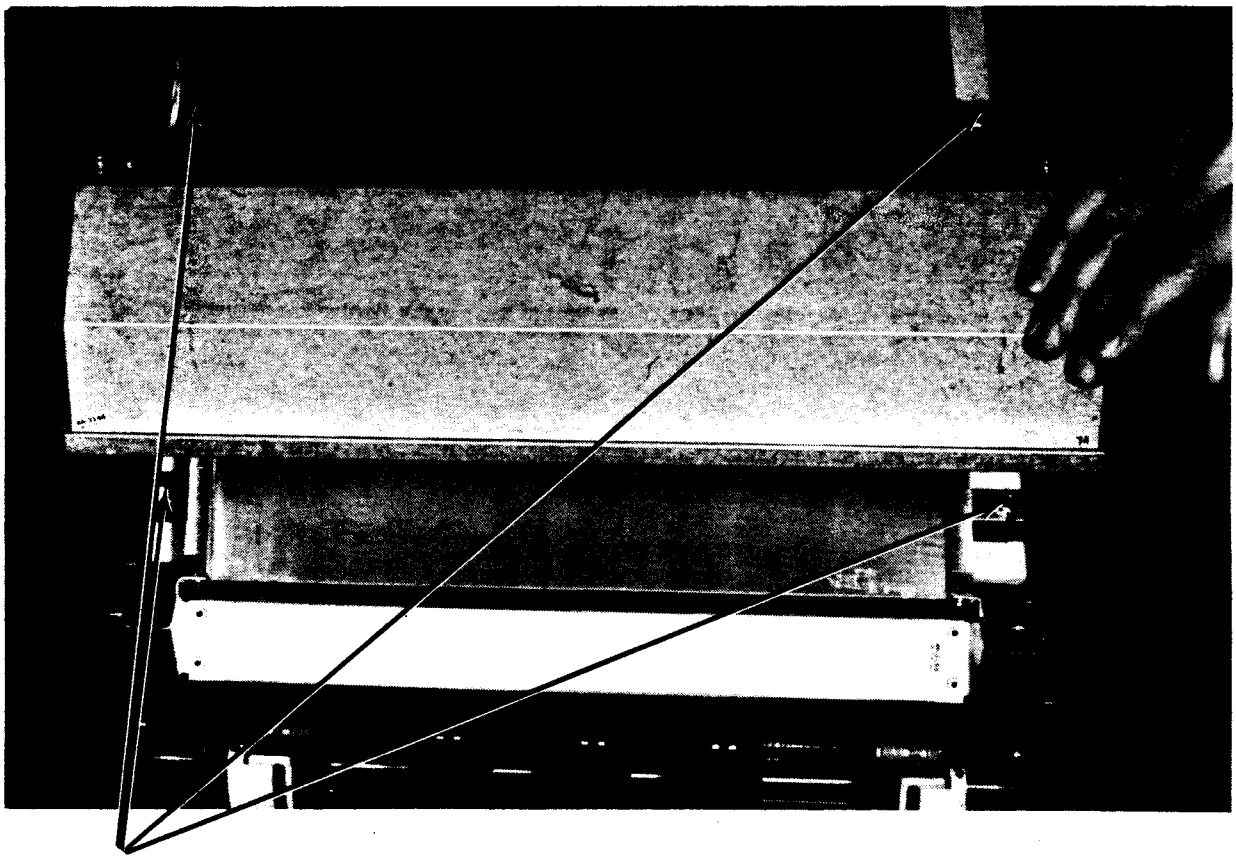
E. Remove the fuser lamp, refer to the Fuser Lamp replacement procedure, section 4-26.

NOTE

If the fuser lamp accidentally contacts your skin, clean the contaminated portion of the lamp with isopropyl alcohol.

F. Disconnect the flex hose.

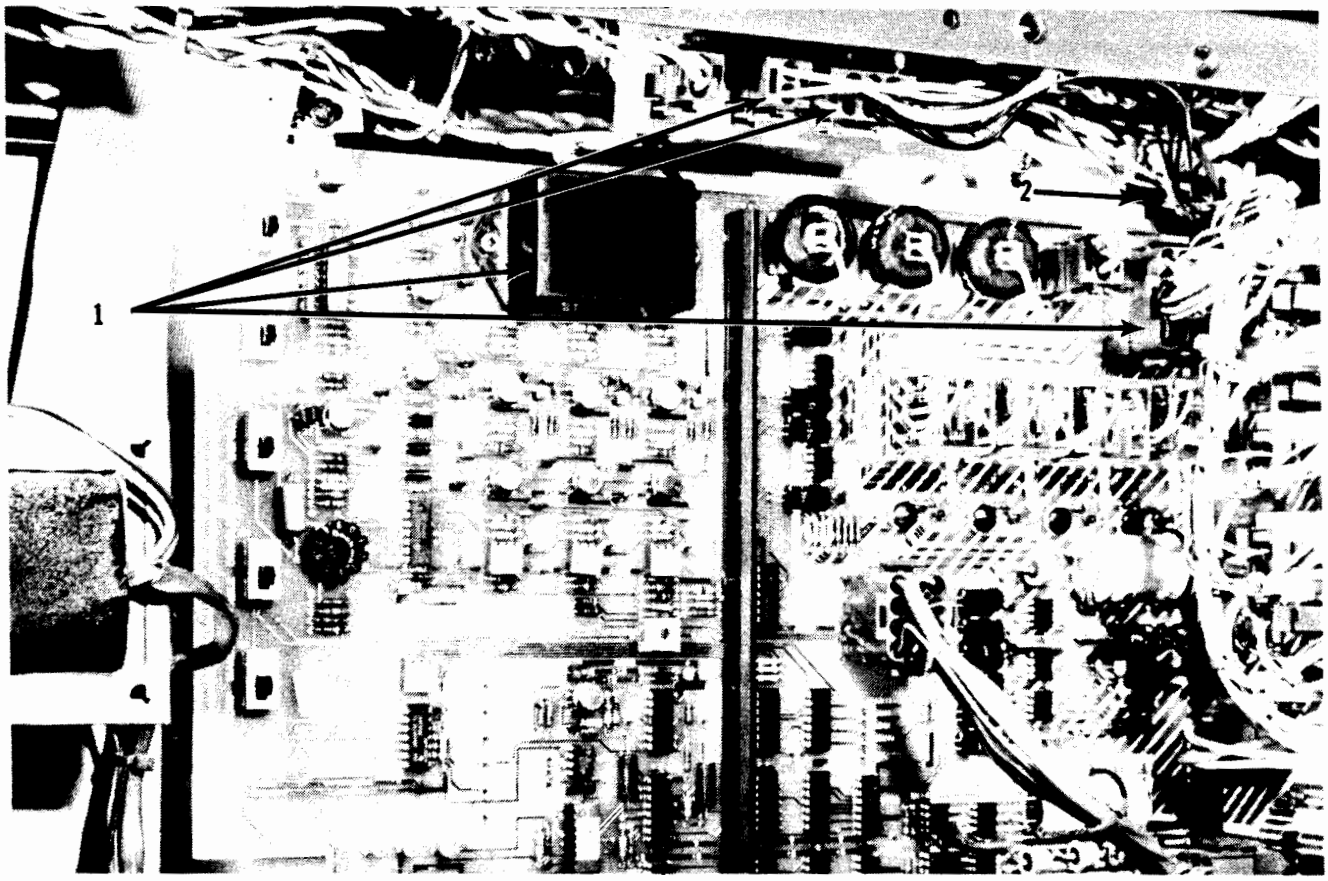
G. Remove the four nuts which secure the preheater assembly to the mainframe (see Figure 4-82).



1. Remove 4 nuts

Figure 4-82. Preheater Assembly.

H. Remove the high voltage shield and disconnect the four connectors as shown in Figure 4-83.



1. Disconnect 4 connectors
2. Mainframe opening

Figure 4-83. Preheater Connectors and Temperature Sensor Cap.

I. Remove the protective cap from the temperature sensors and disconnect the sensor wires.

J. Disconnect the preheater ground strap, this strap is located above the right-side friction wheel.

K. Lift the preheater assembly from the unit.

To install the preheater assembly, proceed as follows:

A. Route the wires from the preheater assembly through the opening in the mainframe (see Figure 4-83), then place the preheater into position in the mainframe.

B. Reverse the procedures listed in step D through step J to install the preheater.

NOTE

The leading edge of the preheater assembly must be the same height as the EP paper exit guide shaft (approximately 1.5 mm above the review window platform) to avoid paper jams. Continue to tighten the two preheater assembly mounting screws nearest the review window until the surfaces are at this level. Tighten the screws on the output tractor side until snug.

C. Set rear MAIN POWER breaker to ON.

D. Press 1117, ENTER to continuously display the preheater pad temperatures. If the new preheater is at room temperature, the display will indicate 33 counts (+/- 10 counts) for pads A, B, and C. To equate the display count to pad temperature, multiply the count by 0.7. This provides an approximate temperature in degrees Celsius.

E. The display counts should be stable or changing slowly toward the approximate room temperature count. If the thermocouples on the preheater have not been connected, or have broken, pad A, B, or C will indicate 255 counts and the message "Phtr overtemp X" (where X = 1, 2, 3, or 4) will be displayed. If the thermocouples were connected to the sensors, the preheater is bad and should be replaced.

F. Load paper in the printer.

G. Run Self Test by pressing 1, ENTER, RUN. During the self test a diagnostic is performed on the preheater. If no errors messages are displayed relating to the preheater, the preheater has passed the diagnostic.

H. Examine the tractor holes in the last sheet of paper below the output tractors. If the holes are elongated or torn on both sides, check the tension settings to ensure that the settings are as specified (refer to the Default Process Settings in Appendix A). If the holes are elongated or torn only on one side, the four preheater mounting bolts may need to be adjusted to relieve binding of the paper. The output tractor preheater screws must be adjusted by trial-and-error.

WARNING

The preheater may be hot at this time. Use caution if attempting to adjust the preheater mounting screws.

4-45. RETRACTION BLADE ADJUSTMENT

The lower retraction blade (transfer blade) is adjusted to provide for maximum paper contact with the photoconductive drum during toner transfer, and zero paper/drum contact when drum seam passes under the transfer station. The retraction blade is adjusted at the factory and should only be re-adjusted if the transfer assembly is replaced or if the service representative suspects that the blade is out of adjustment. To adjust the retraction blade, proceed as follows:

EQUIPMENT NEEDED

- Retraction Blade Adjustment Tool (HP part number 02682-20458)
- Screw driver (Cross-tipped)
- 5/16 inch open-end wrench
- Flashlight
- Spring Pusher

A. If paper is loaded in the printer, tear off the paper at the input tractors and press the EJECT ALL key to purge the printer of paper.

B. Set the rear MAIN POWER breaker to OFF.

C. Open the paper input door (above the input tractors), remove the EP interior closeout panel (next to the review window) and the printer rear panel.

WARNING

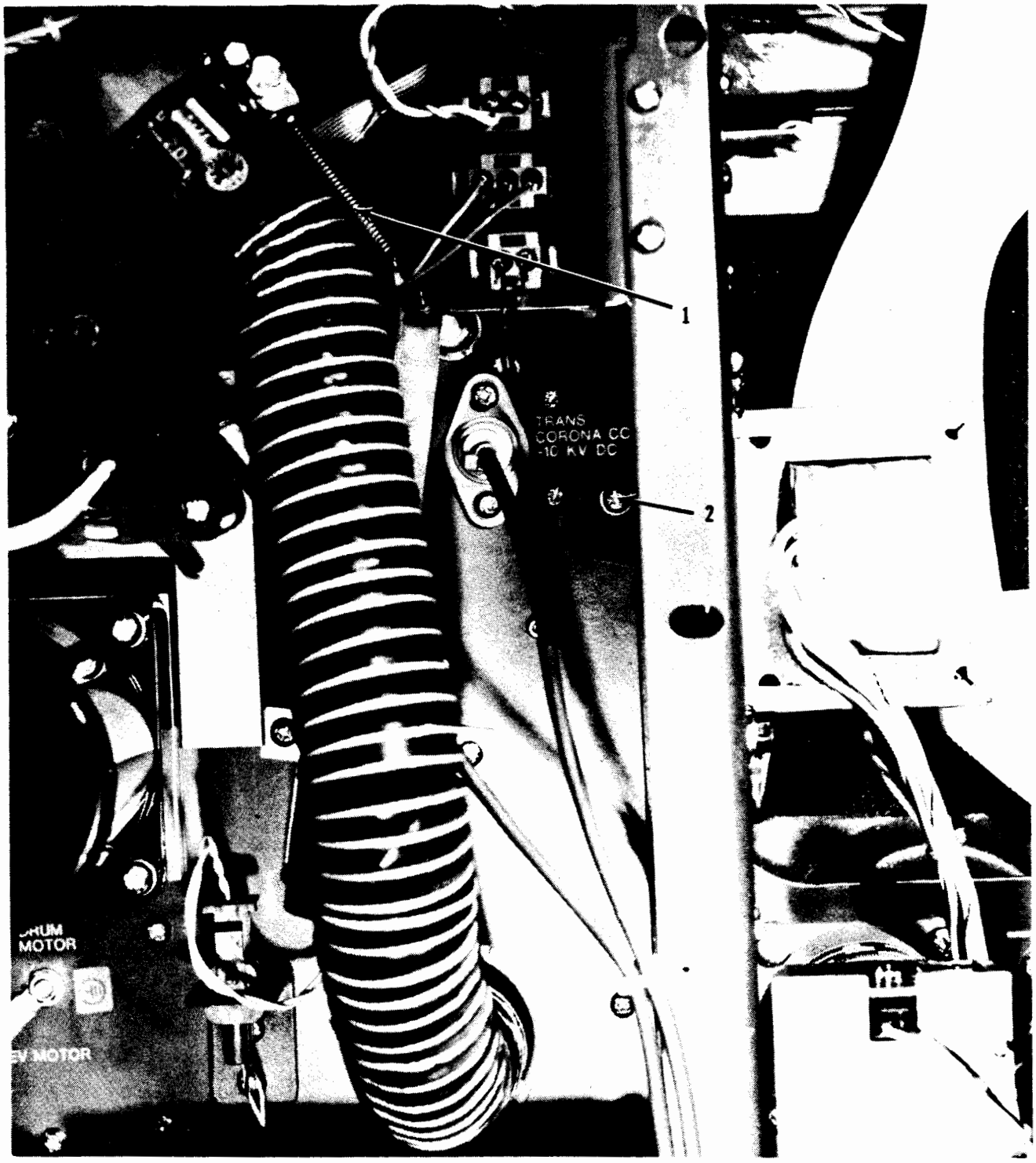
If power has been applied to the printer, allow 15 minutes for the drum shaft to cool before touching.

D. Remove the photoconductive drum from the printer, refer to MP 3-Photoconductive Drum Removal procedure, Chapter V.

At the conclusion of step D, the following items should be removed from the printer:

Developer Assembly
Cleaner Station
Corona Assemblies (Three)
Electrostatic Monitor
Drum End Plate
Photoconductive Drum

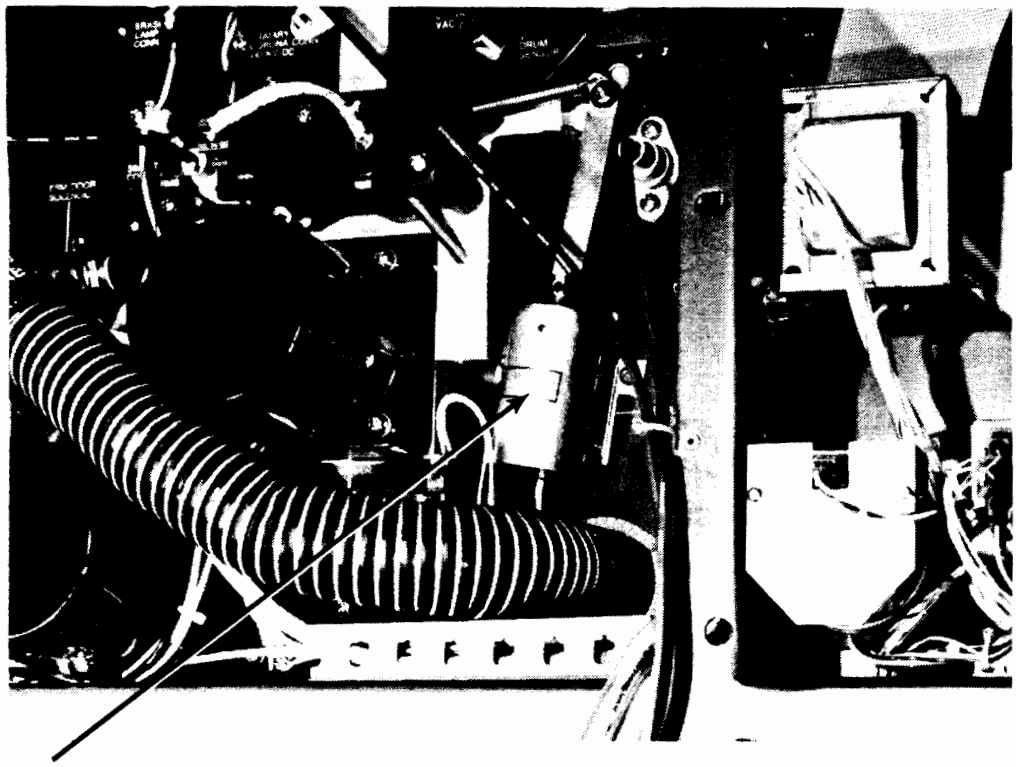
E. Using the spring pusher, disconnect the retraction solenoid spring from the spring support bracket (see Figure 4-84).



1. Retraction solenoid spring
2. Rear adjustment screw

Figure 4-84. Retraction Solenoid Assembly.

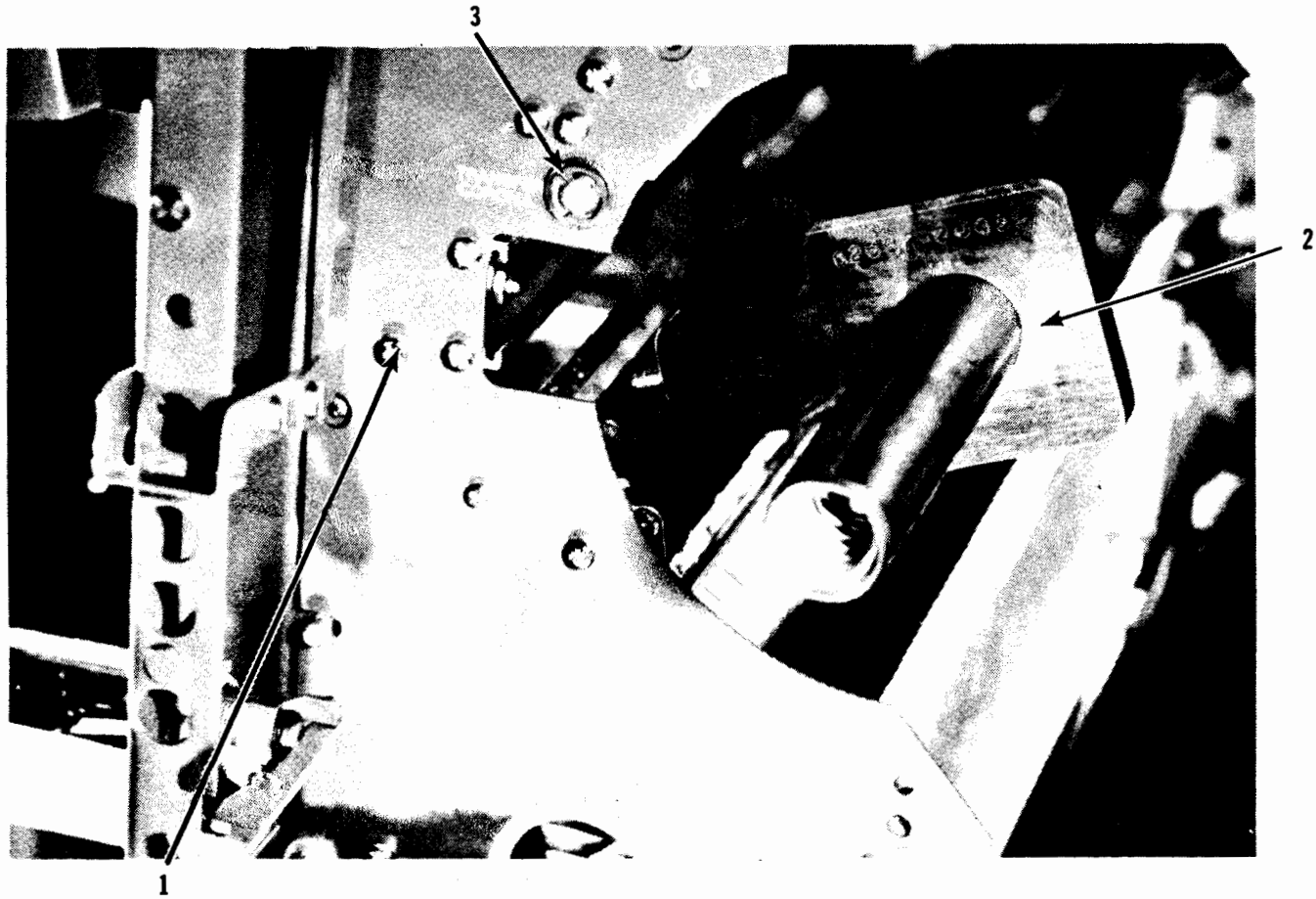
F. Position the retraction solenoid arm into the assembly (see Figure 4-85). This simulates the engaging of the retraction solenoid.



1. Retraction solenoid

Figure 4-85. Retraction Solenoid (Arm Engaged).

G. Install the Lower Retraction Blade Adjustment tool on the drum shaft as shown in Figure 4-86. Ensure that the 1/4 inch diameter pin of the adjustment tool rests on the top of retraction blade and that the part number of the tool faces outward.



1. Front adjustment screw
2. Retraction blade adjustment tool
3. Upper retraction bar bearing

Figure 4-86. Lower Retraction Blade Adjustment Tool (End Plate Off).

H. Install the drum end plate.

I. To verify the adjustment, rock the adjustment tool up and down and observe the point of contact between the retraction blade and the adjustment tool. A flashlight is necessary to observe this contact. Adjustment is correct when the tool does not deflect the retraction blade and no gap is visible between the two surfaces. Verify that the adjustment is correct at both ends of the drum shaft. The adjustment tolerance is +/- 0.3 mm.

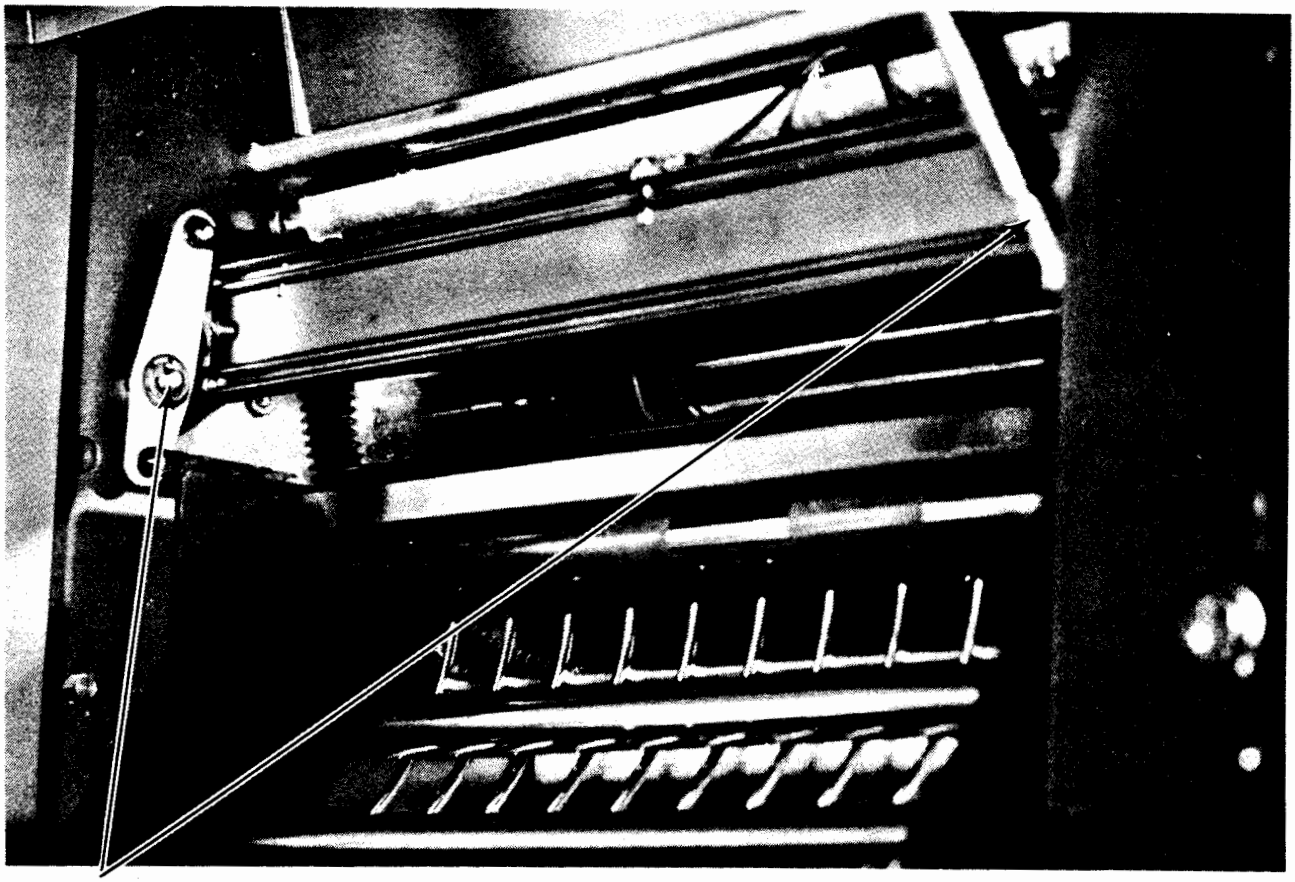
If the adjustment is correct, proceed to step K. If adjustment is necessary proceed to step J.

J. To adjust the retraction blade, proceed as follows:

NOTE

The adjustment screw secures a stud attached to the pivotal linkage which positions the retraction blade. The stud may be moved in a slotted opening in the EP panel. The position of the stud in the slot determines the distance between the retraction blade and the adjustment tool.

1. Loosen the screw shown in Figure 4-87; the screw should only be loosened enough to release the tension from the stud to allow for adjustment.



1. Retraction blade adjustment stud

Figure 4-87. Retraction Blade Adjustment Studs.

2. Adjust the position of the stud in the slotted opening until the desired adjustment is obtained. Some trial and and error may be required to achieve the desired adjustment.

3. Once the retraction blade is in the correct position, tighten the adjustment screw while holding the adjustment stud from inside the printer, with a 5/16 inch open-end wrench.

4. Repeat steps 1 through 3 for the rear adjustment stud on the back of the printer.

5. When both ends of the retraction blade have been adjusted, re-install the retraction solenoid spring removed in step G.

K. Remove the drum end plate and adjustment tool.

L. Install all items removed in step D per MP 4-Photoconductive Drum Installation procedure, Chapter V. It may be necessary to perform MP 6-New Drum/Wiper Routine when replacing the cleaner station; refer to Chapter V.

M. Re-install the printer's rear panel and EP interior closeout panel. Close the printer top cover and front door.

N. Set the rear MAIN POWER breaker to ON and resume printing.

4-46. RETRACTION BRUSH REPLACEMENT

To replace the retraction brush, proceed as follows:

A. If paper is loaded in the printer, tear off the paper at the input tractors. Press the EJECT ALL key on the paper control panel to purge the printer of paper.

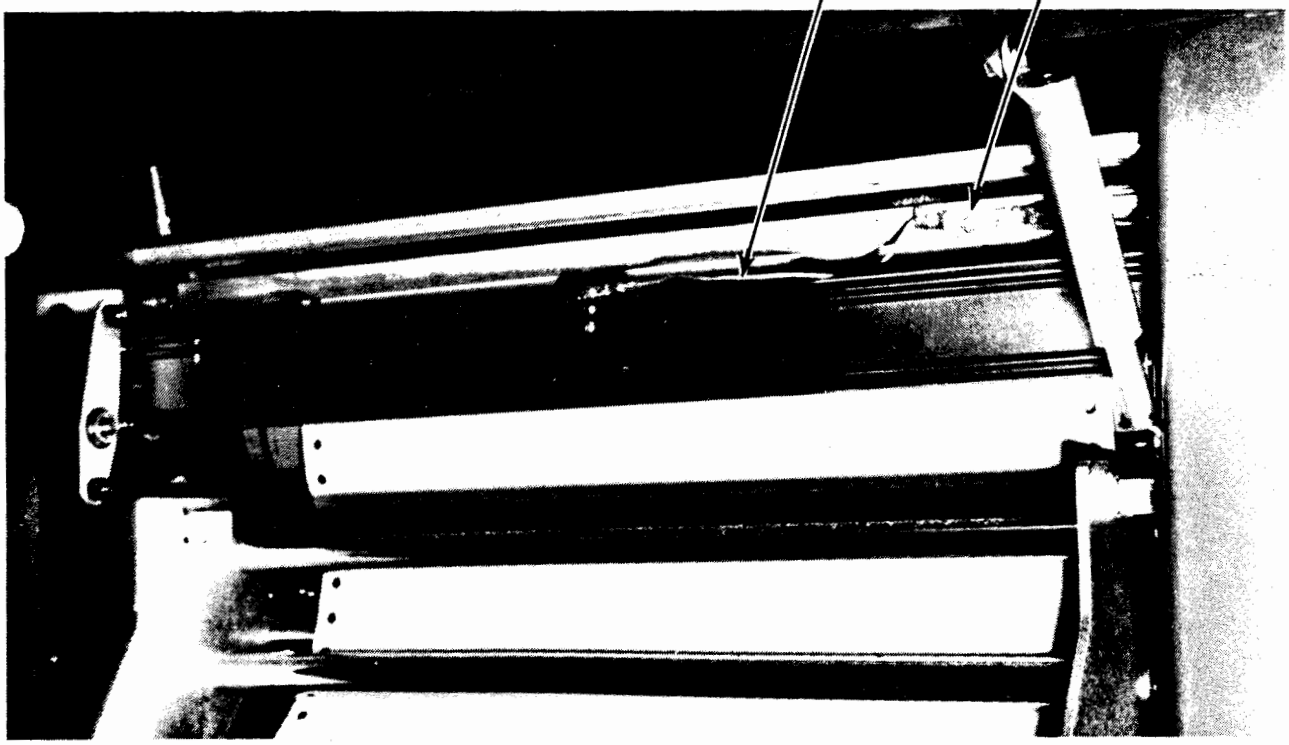
B. Set the rear MAIN POWER breaker to OFF.

C. Disconnect the retraction ground wire (see Figure 4-88). It has a spade lug connector.

D. Remove the E-clip and bearing from the front upper retraction bar (Figure 4-86, callout #3).

E. Feed the wire through the bearing opening

F. Slide the brush out towards the front



1. Retraction brush ground wire
2. Retraction brush spade connector

Figure 4-88. Retraction Brush Ground Wire.

Reverse the above procedure to install the retraction brush. The retraction brush assembly ground wire, which grounds the spade lug connector to the retraction blade assembly (see Figure 4-88) must be replaced when the retraction brush is replaced. Verify that this wire is replaced (HP part number 02682-60429) when a new retraction brush is installed. Check the resistance from the bristles of the retraction brush to the ground wire. It should measure between 6-50 KOhms.

4-47. SCANNER MOTOR REPLACEMENT

To replace the scanner motor, proceed as follows:

WARNING

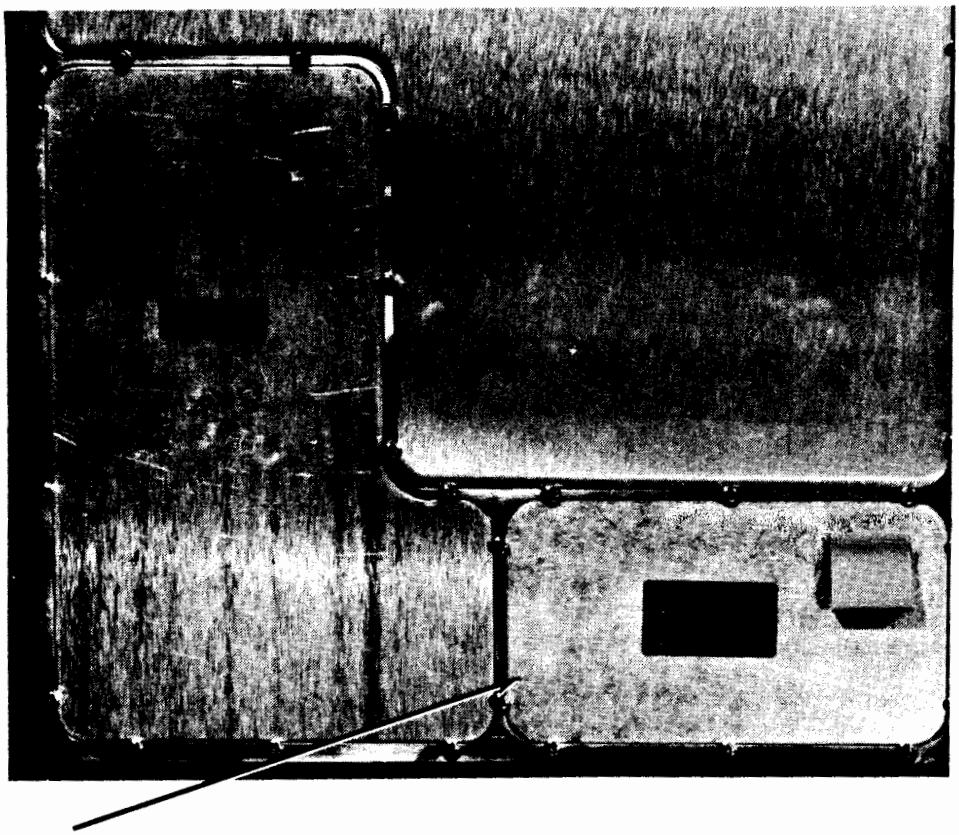
Set the rear MAIN POWER breaker to OFF. If a locking power switch is provided, lock the power switch to the OFF position.

A. Set the rear MAIN POWER breaker to OFF.

B. Remove the printer rear panel.

C. Remove the printer's right side outer panel. Two quarter turn fasteners are located on the inside of the end rails. The front fastener is located behind the toner hopper, and the rear fastener is exposed whenever the rear panel is removed.

D. Remove the cover from the scanner motor cavity (see Figure 4-89).



1. Scanner motor cavity cover

Figure 4-89. Scanner Motor Cavity Cover.

CAUTION

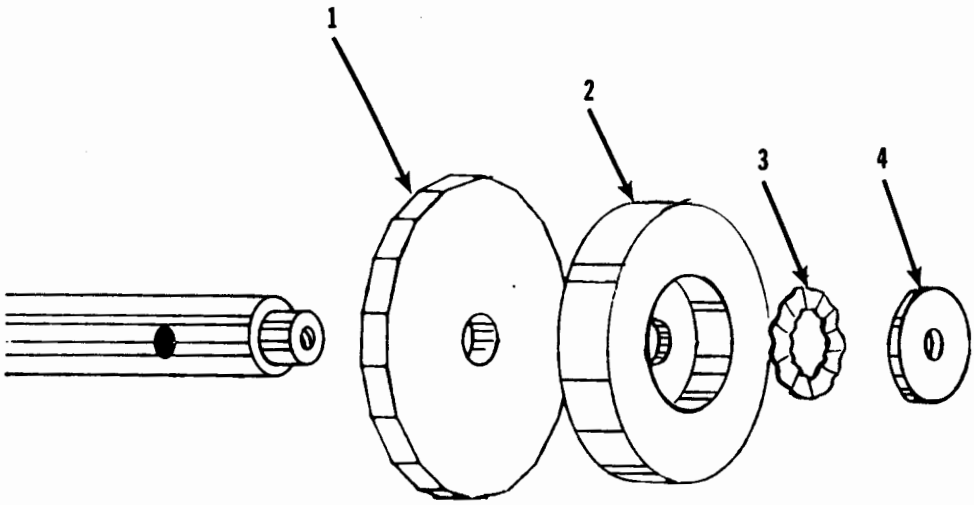
The scanner flywheel and polygon are precision assemblies. Care must be taken to keep assemblies perpendicular to the hub shaft when removing and installing the scanner motor. Under NO CIRCUMSTANCES should excessive force be used in replacing these assemblies.

CAUTION

Do not touch any of the reflective faces of the polygon mirror. If this should inadvertently occur, clean the mirror surface according to the Polygon Cleaning procedure in this section of the manual.

E. Remove the scanner flywheel and polygon as follows:

1. Insert a small allen wrench (approximately 2 to 2.5mm) into the one of the four holes in the scanner motor hub (behind the flywheel and polygon), see Figure 4-90. This prevents the shaft from slipping when removing the flywheel locking screw.



1. Polygon
2. Scanner flywheel
3. Wavy washer
4. Washer

Figure 4-90. Scanner Flywheel, Polygon and Set Screw.

2. Manually rotate the flywheel so that the allen wrench installed in step 1 wedges against the side of the scanner motor cavity, see Figure 4-91.

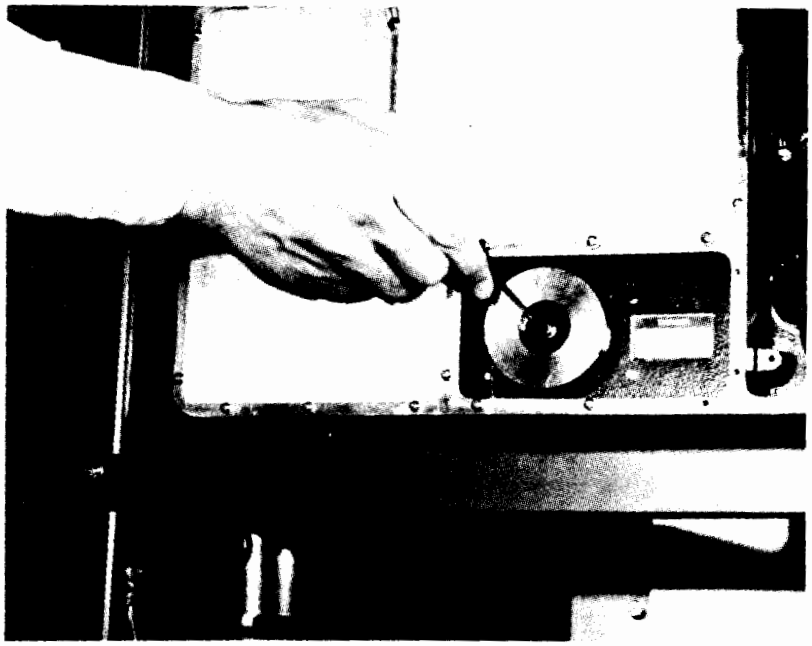


Figure 4-91. Locking Scanner Motor Drive Shaft.

3. Using a 3 mm internal hex driver (allen wrench) remove the locking screw, lock washer, flat washer, scanner washer, and wavy washer from the flywheel.

4. Carefully remove the flywheel and polygon from the scanner motor drive shaft.

NOTE

Once the polygon mirror is removed, surround the mirror with lense tissue and place it in a protected location until it is ready to be reinstalled. Handle the mirror as shown in Figure 96. Do NOT touch the mirrored surfaces.

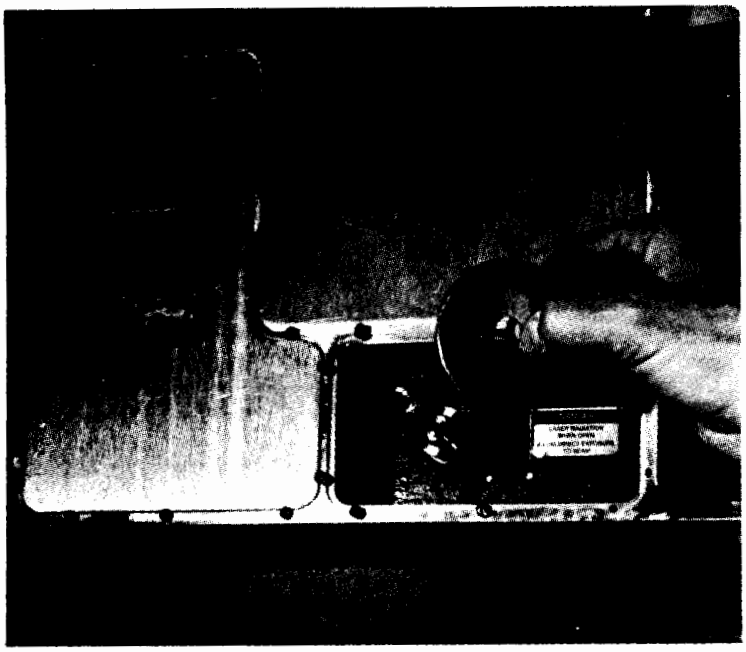


Figure 4-92. Correct Handling of Polygon.

F. From the backside of the optics casting, remove the protective bracket from around the scanner motor.

G. Unplug the ribbon connector to the scanner motor.

H. Using a 3 mm internal hex driver, remove the four screws which secure the scanner motor to the optics casting and remove the motor.

Install the new scanner motor by reversing the removal procedure. Inspect the mirrored polygon for fingerprints and scratches prior to installing onto the scanner motor drive shaft. Clean or replace the polygon if necessary, refer to the following procedure for cleaning the mirrored polygon.

Polygon Cleaning

The mirrored polygon should only be cleaned if inadvertently touched or soiled during removal or installation. To clean the polygon, proceed as follows:

A. Hold the polygon as shown in Figure 4-92.

B. Moisten an approved type of lens tissue with isopropyl alcohol.

C. Place the moistened lens tissue on the soiled section of the polygon facet and carefully slide the lens tissue away.

D. Repeat steps B and C with a new section of the moistened lens tissue until the polygon surface is clean.

4-48. STACKER SAFETY SWITCH REPLACEMENT

Eight stacker safety switches are located in the vicinity of the paper stacker. These switches are used to reverse the direction of the stacker table in the event an operator's extremity is caught between the flapper and/or chain box, and the stacker table. Four switches are located above the chain box assembly and four switches are located above the flapper box assembly. To replace these switches proceed as follows:

Chain Box Stacker Safety Switches

A. Set the Front ON/OFF switch to OFF.

B. Open the paper output door.

C. Remove the five screws which mount the paper control panel bezel. The screws are located around the bezel as follows: one screw on the center left side, one screw each on the right bottom and left bottom sides, and two flat-head screws on the top side (see Figure 4-4, section 4-6).

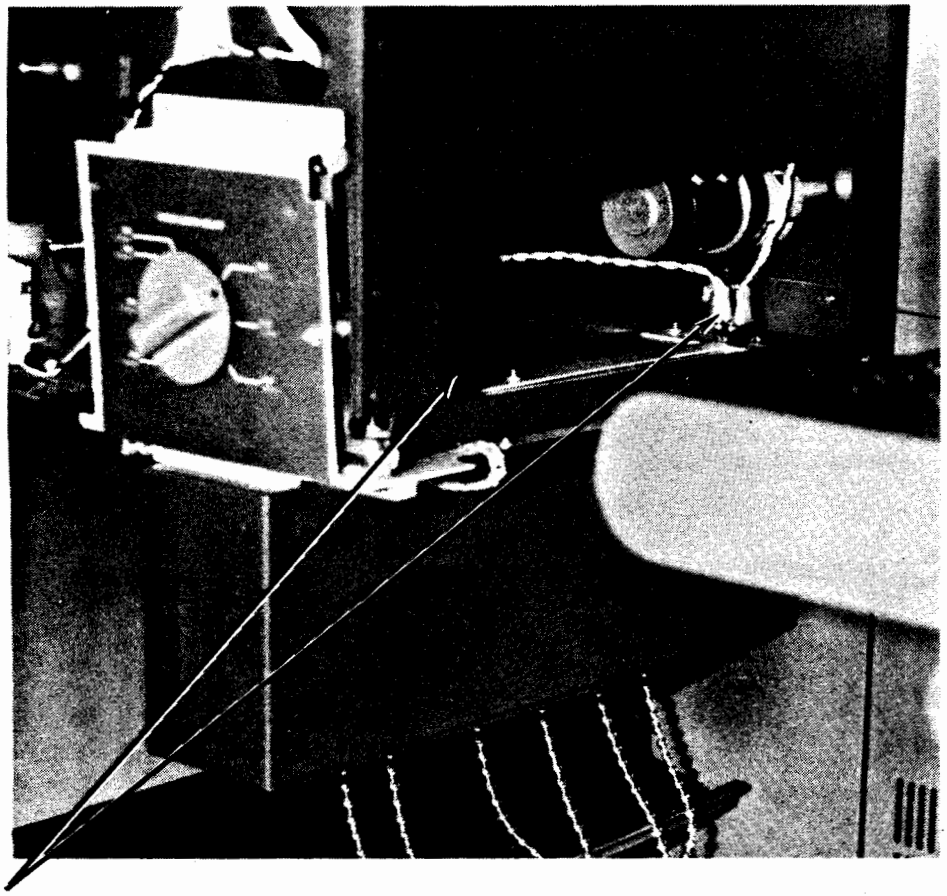
D. Remove the paper control panel bezel and disconnect the ribbon cable inside.

E. Remove the three screws from the chain box right-side panel (see Figure 4-5, section 4-6) and remove this panel.

F. Two safety switches are located at each end of the chain box T bar (see Figure 4-93). To remove these switches proceed as follows:

   1. Remove the safety switch connector on the switch(es) to be removed.

   2. Remove the two cross-hatched screws at the lower side of the switches which secure the switches to the T-Bar bracket, and remove the switch(es).



1. Safety switch

Figure 4-93. Chain Box Stacker Safety Switches.

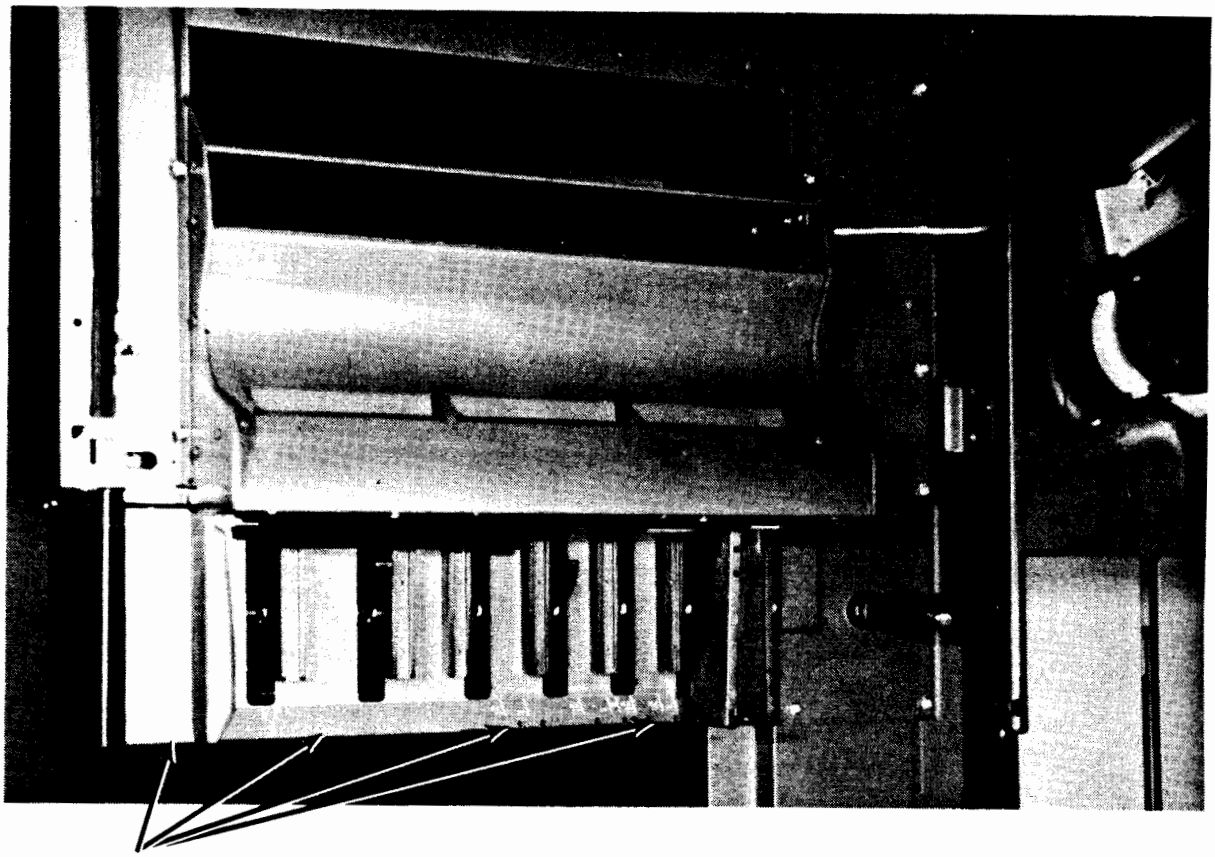
Install the new safety switches by reversing the removal procedure. When installing the new switches, ensure that the switches are properly adjusted (move the chain box assembly up and down and listen for the micro-switches to determine if they are activating).

Flapper Box Safety Switches

A. Set the Front ON/OFF switch to OFF.

B. Open the paper output door.

C. Remove the four cross-hatched screws which secure the paper compactor guide (see Figure 4-94).



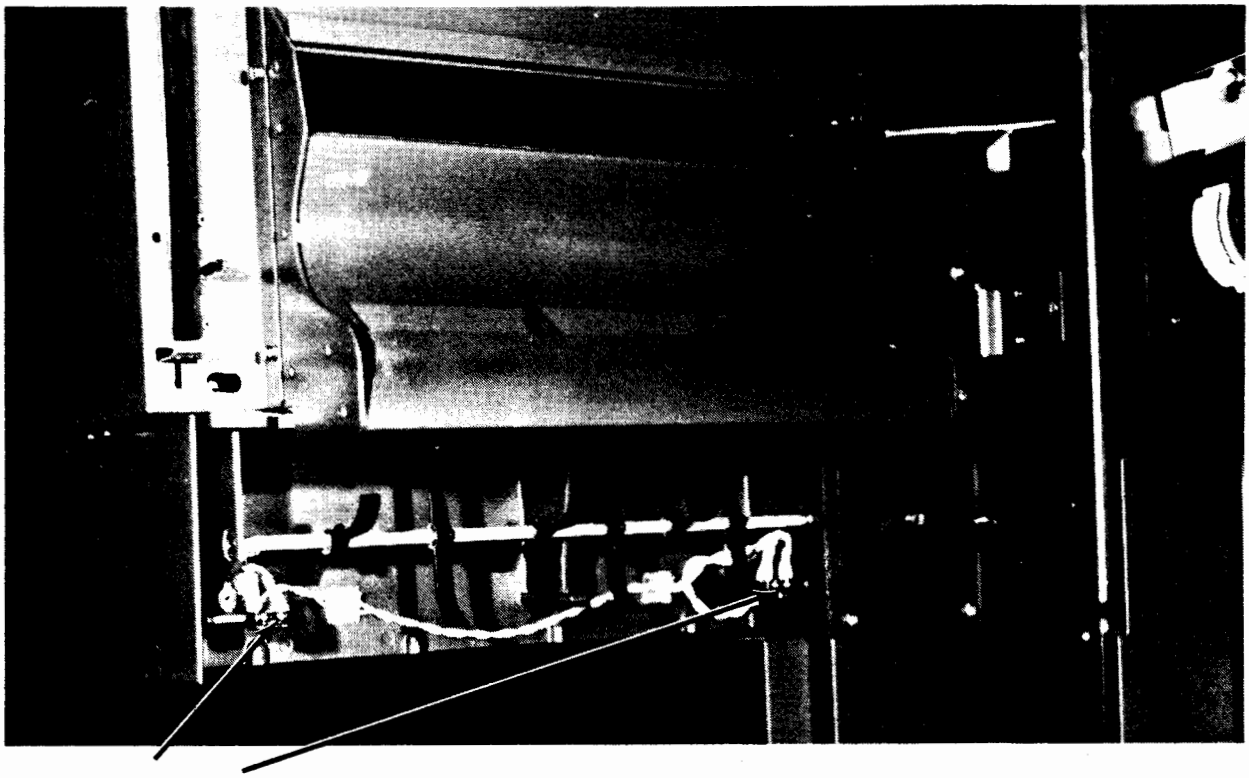
1. Remove 4 screws

Figure 4-94. Paper Compactor Guide.

D. Two pairs of micro-switches are located at each end of the flapper assembly (see Figure 4-95). To replace these switch(es), proceed as follows:

1. Remove the safety switch connector on the switch(es) to be removed.

2. At the lower edge of the switches, remove the two cross-hatched screws which secure the switches to the bracket in the flapper box. Remove the switches.



1. Safety switches

Figure 4-95. Flapper Box Safety Switches.

Install the new safety switches by reversing the removal procedure. When installing the new switches, ensure that the switches are properly adjusted (move the flapper box assembly up and down and listen for the micro-switches to determine if they are activating).

4-49. TENSION MOTOR SETTING ADJUSTMENTS

When the printer is first installed the service representative should set the paper tension values (start, run and stop) to the values listed on the self test print sample.

If any of the tension settings vary, use the 3XX command sequence to change the printer tension settings to match those listed on the factory Self Test print-out.

Due to changes in environmental conditions, variations in paper types and weights, and mechanical wear in the paper tensioning system, it may be necessary to change the printer Run tension setting. Changes to the Run tension should be made in one count increments until the correct tension is obtained. The following is a list of criteria to assist the service representative in determining the correct Run tension.

- If the paper tends to buckle near the review window during printing, the Run tension may be set too low.
- If the paper rubs on the top of the preheater, the Run tension may be set too low.
- Smeared print on the leading edge of the printed page may indicate that the Run tension is too low.
- Examine the printed output. If the paper tractor feed holes appear elongated, the Run tension is probably set too high.
- Excessive paper jams may indicate that the Run tension is NOT correctly set.
- As a general rule, lighter weight paper requires less Run tension than heavier weight paper.

NOTE

Incorrect setting of the vacuum valve can add extra drag on the tension motor and paper.

The changing of the paper tensioning setting may be performed in the operator access level (the printer does not need to be in the service access level). The service representative should educate his customers, on a need to know basis, of how and when to change the Run tension setting.

4-50. TENSION MOTOR SPEED ADJUSTMENT

See 4-7. CONTROL PCA ADJUSTMENT for the tension motor speed adjustment procedure.

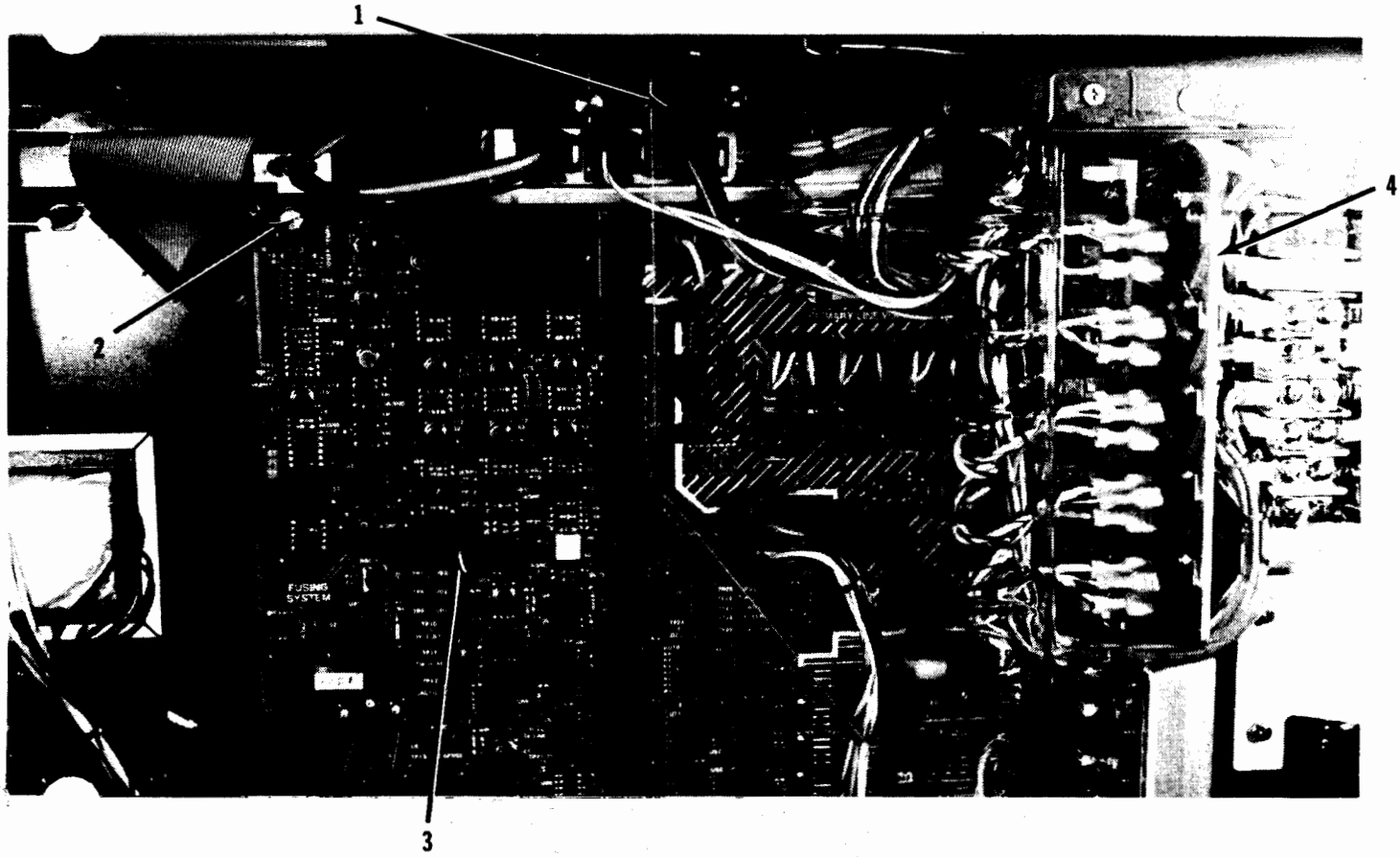
4-51. TRIAC PCA REMOVAL

To remove the Triac PCA, proceed as follows:

A. Set the rear MAIN POWER breaker to OFF.

B. Remove the printer rear panel.

C. Remove the high voltage shield which covers the Triac PCA shown in Figure 4-96.



1. High voltage shield
2. Captive screw
3. AC power PCA
4. Triac PCA

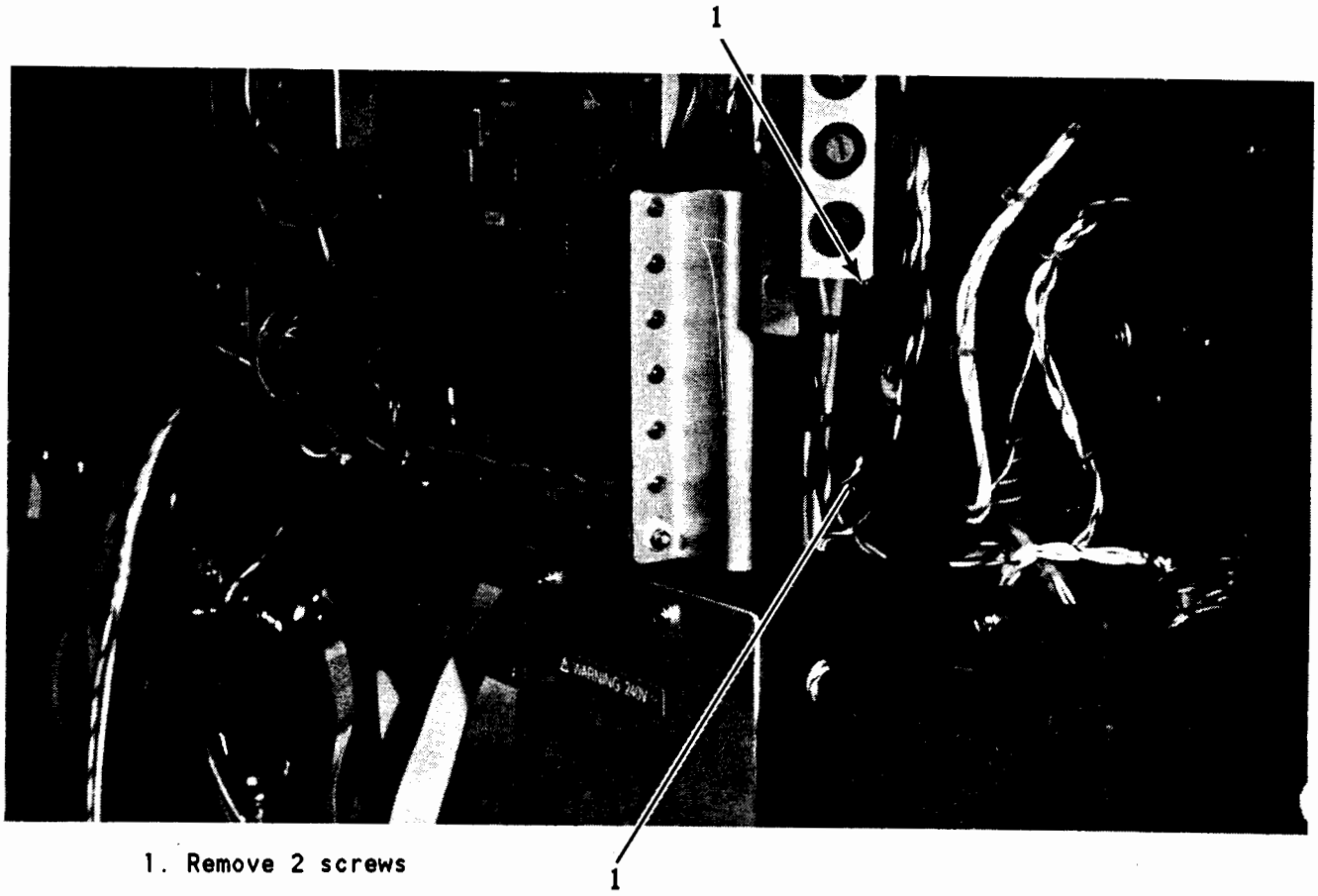
Figure 4-96. AC Power and Triac PCA.

D. Loosen the captive screw at the upper left corner of the AC Power PCA, then slide the AC Power PCA to the left until it is free of the edge connector on the Triac PCA.

E. Disconnect the seven connectors from the Triac PCA.

F. Loosen the top screws which secure tha AC Power PCA and slide the AC Power PCA to the left. This will provide room so that the Triac PCA can be moved.

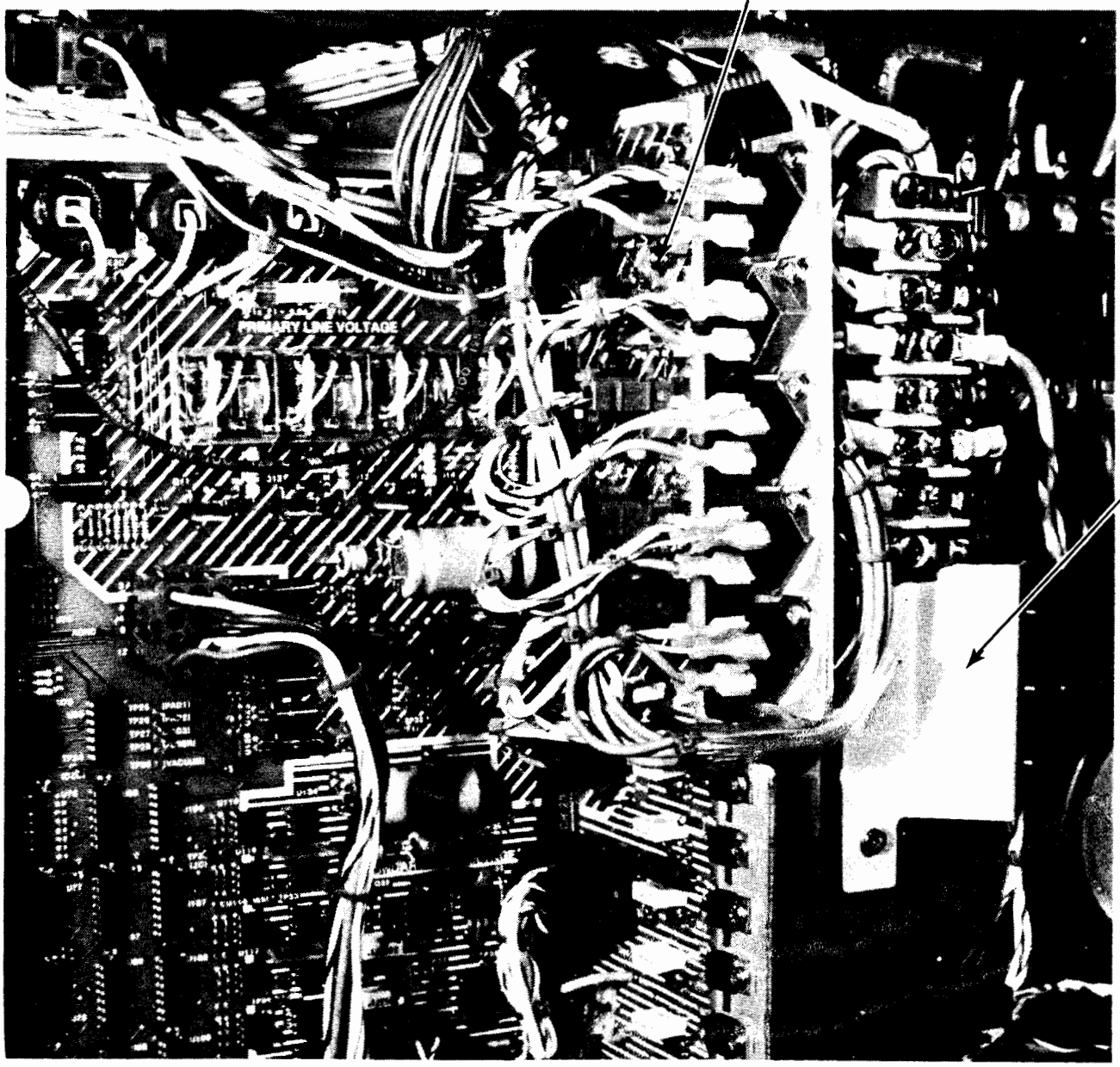
G. Remove the two bottom screws opposite the frame member on which the Triac PCA is mounted (see Figure 4-97).



1. Remove 2 screws

Figure 4-97. Triac PCA Mounting Screws (Back).

H. Loosen, but do not remove the top mounting screw on the component side of the Triac PCA (see Figure 4-98).



1. Loosen top mounting screw
2. Fuse plate

Figure 4-98. Triac PCA Mounting Screw (Front).

I. Remove the Triac PCA by sliding the top screw of the PCA through the key-hole slot and lift the PCA away from printer.

J. Before installing the new Triac PCA, check the three fuses in the fuse plate to ensure that none of the fuses are open.

To install the Triac PCA, reverse the removal procedure.

4-52. VACUUM ASSEMBLY REMOVAL

The vacuum assembly can be removed as follows:

WARNING

Set the rear MAIN POWER breaker to OFF. Serious injury can result if the vacuum motor starts spinning while performing this procedure.

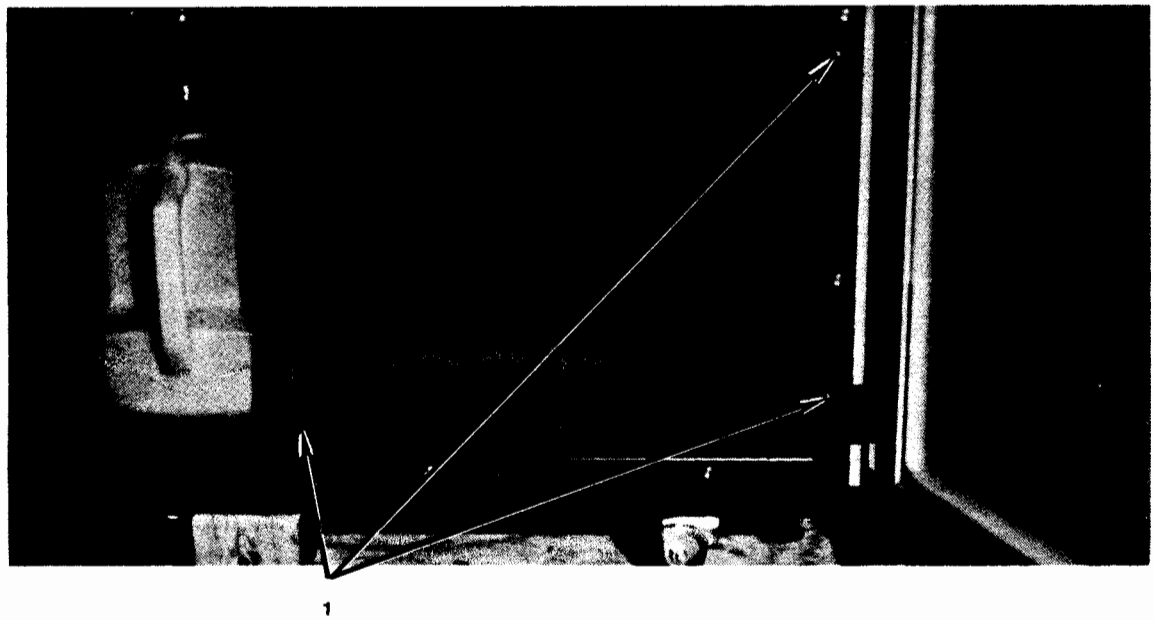
A. Set the rear MAIN POWER breaker to OFF.

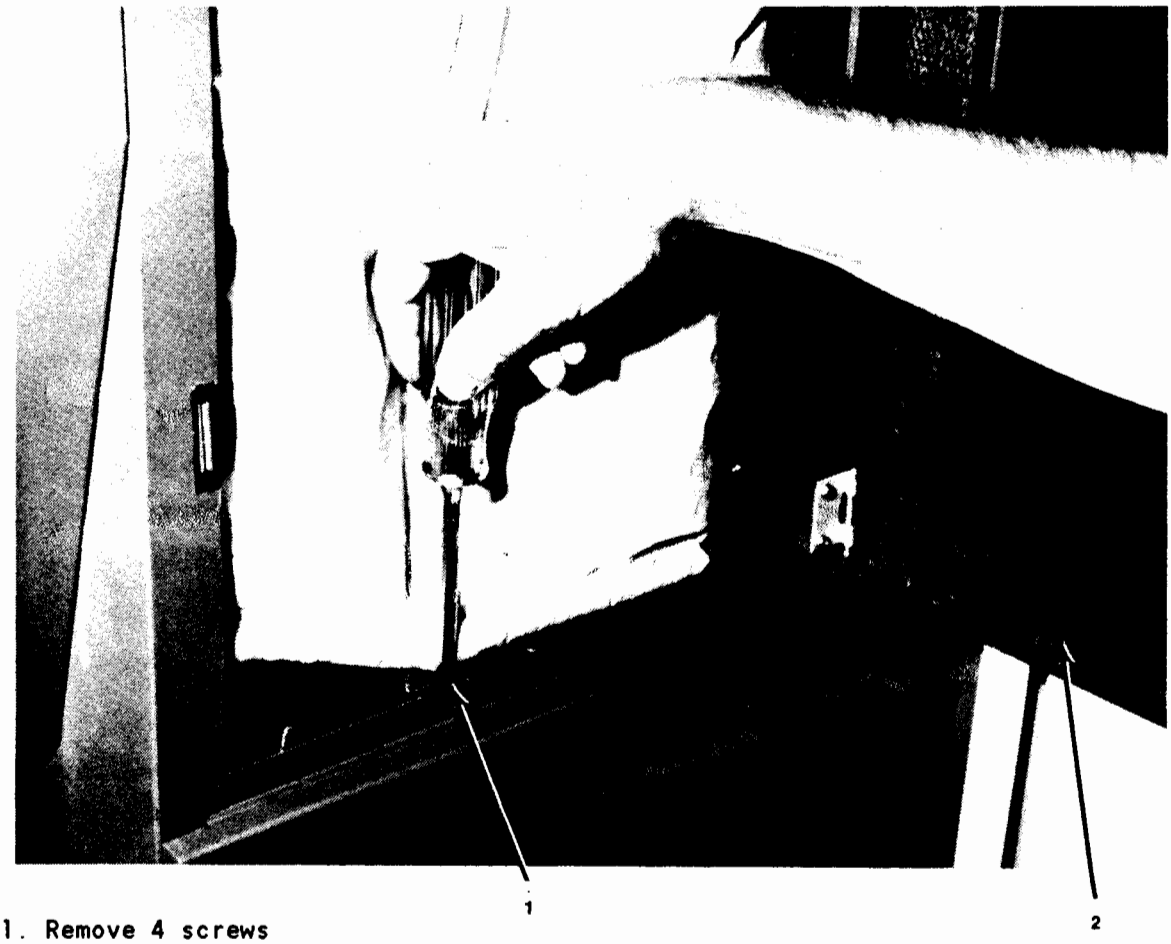
B. Open the printer top cover and remove the printer rear panel.

C. Remove the right side outer panel.

D. Open the toner disposal door.

E. Remove the lower cover panel. The screws are located as shown in Figure 4-99.

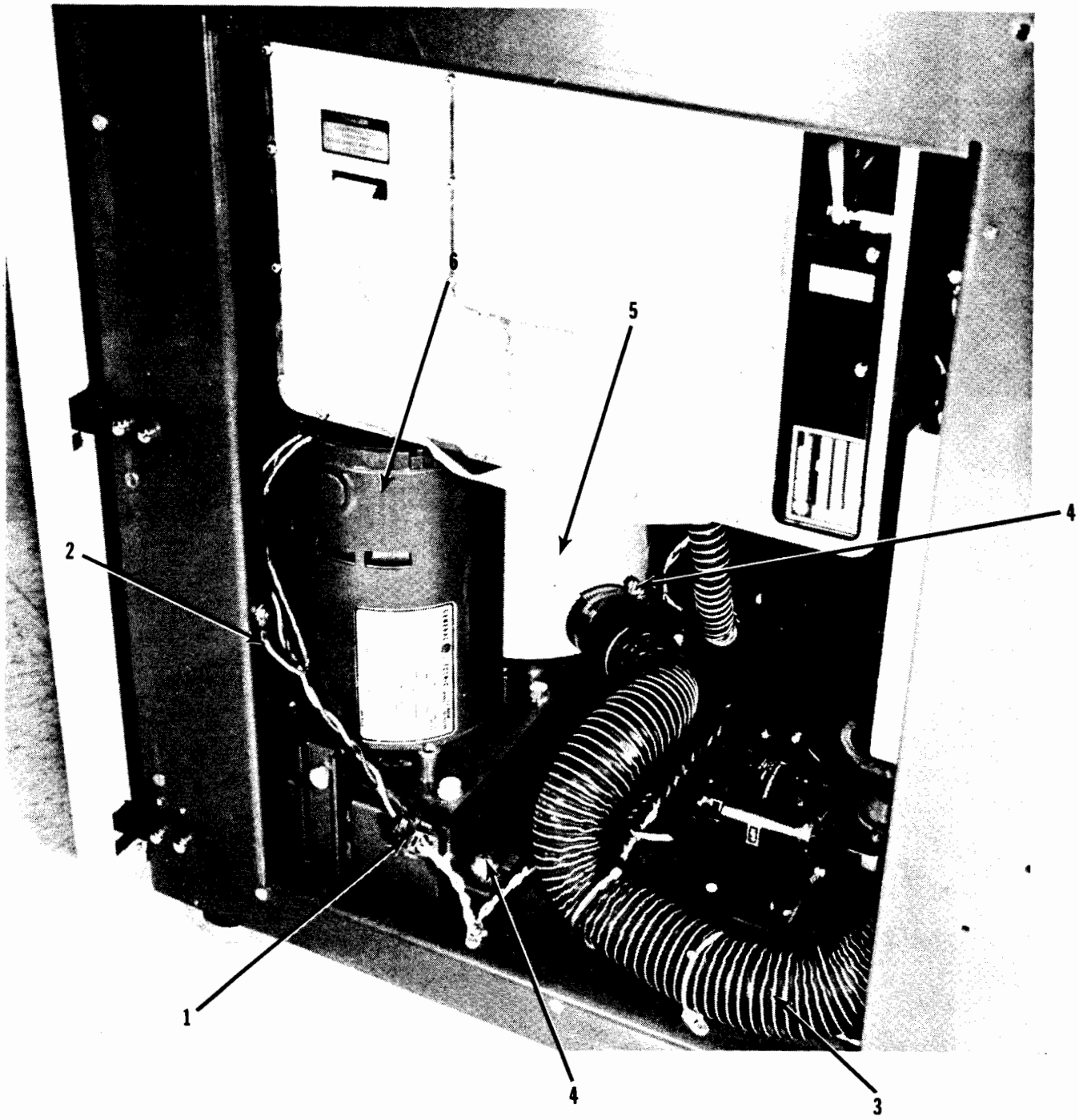




1. Remove 4 screws
2. Vacuum system door

Figure 4-99. Vacuum System Cover Panel.

F. Disconnect the vacuum system power connector and the ground wire (see Figure 4-100).



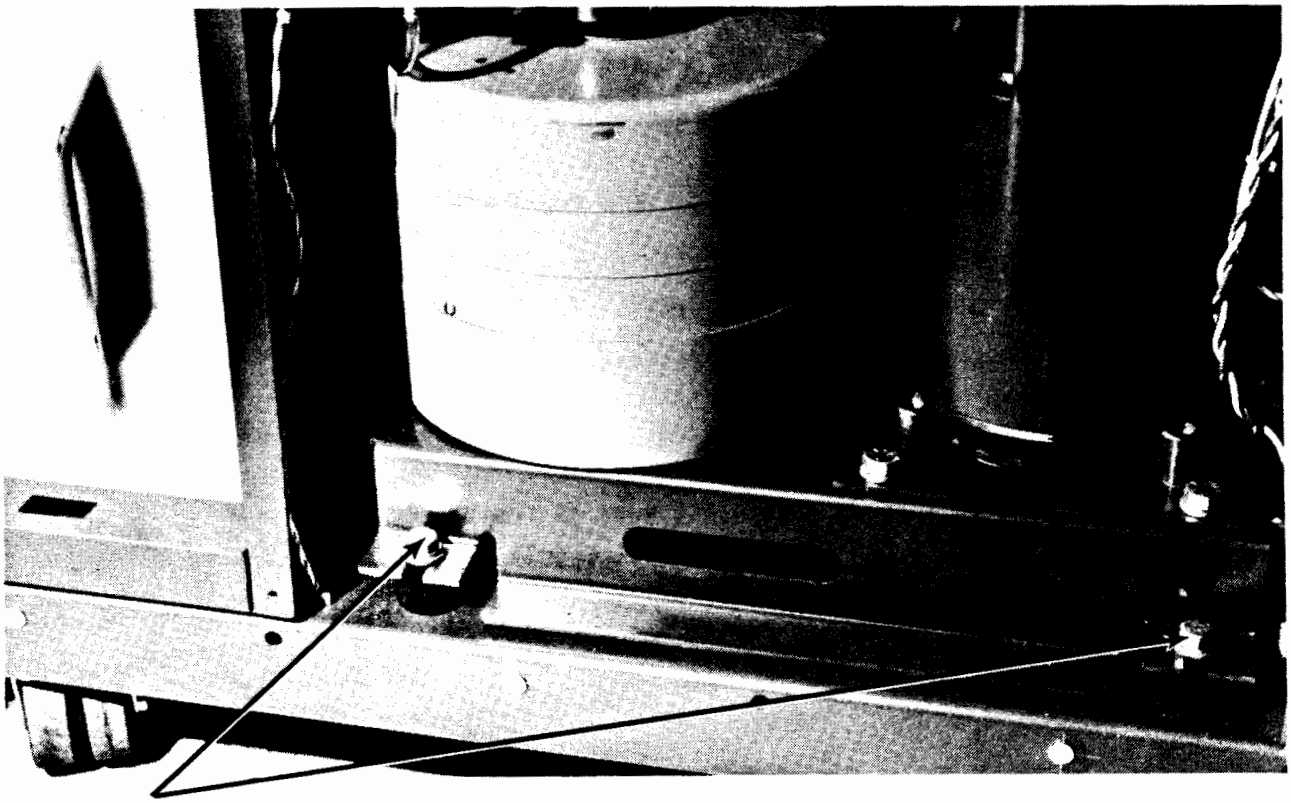
1. Vacuum system power connector
2. Ground wire
3. Flex hose
4. Remove 2 mounting bolts
5. Vacuum blower
6. Vacuum motor

Figure 4-100. Vacuum Assembly (Right Side View).

G. Remove the flex hose from the bottom rear of the vacuum fan.

H. Loosen the "T" hose at the top of the vacuum fan. It will come off as the assembly is removed from the printer.

I. Remove the four bolts which secure the vacuum cleaner assembly to the printer frame (see Figures 104 and 105).



1. Remove 2 mounting bolts

Figure 4-101. Vacuum Assembly (Front View).

WARNING

The vacuum assembly weighs approximately 42 pounds (19 kg). Be careful when removing this assembly from the printer to avoid injury to hands or feet.

J. Be careful not to damage the air pressure sensor (located at the top, left corner of the vacuum assembly) as you pull the assembly out of the printer.

K. Replacement of the motor, fan, or belt can now be easily accomplished.

When installing a vacuum assembly in the printer, reverse the procedure given above. Ensure that the motor is on the right side and that the fan is on the left side. Align the rear mounting bolts before installing the front mounting bolts. Turn on the motor assembly and verify that the motor otation is in a counter-clockwise direction as viewed from the top. If the rotation is incorrect, restrap the motor as indicated on the motor label.

4-53. VACUUM SYSTEM BELT TENSION

NOTE

The vacuum exchange assemblies, part number 02682-69510 (50 Hz) and 02682-69193 (60 Hz) use a new style vacuum belt. The part number of new belt is 1500-0680.

The vacuum system belt should be properly tensioned on a regular basis and whenever the belt is replaced. The vacuum system belt tension is adjusted as follows:

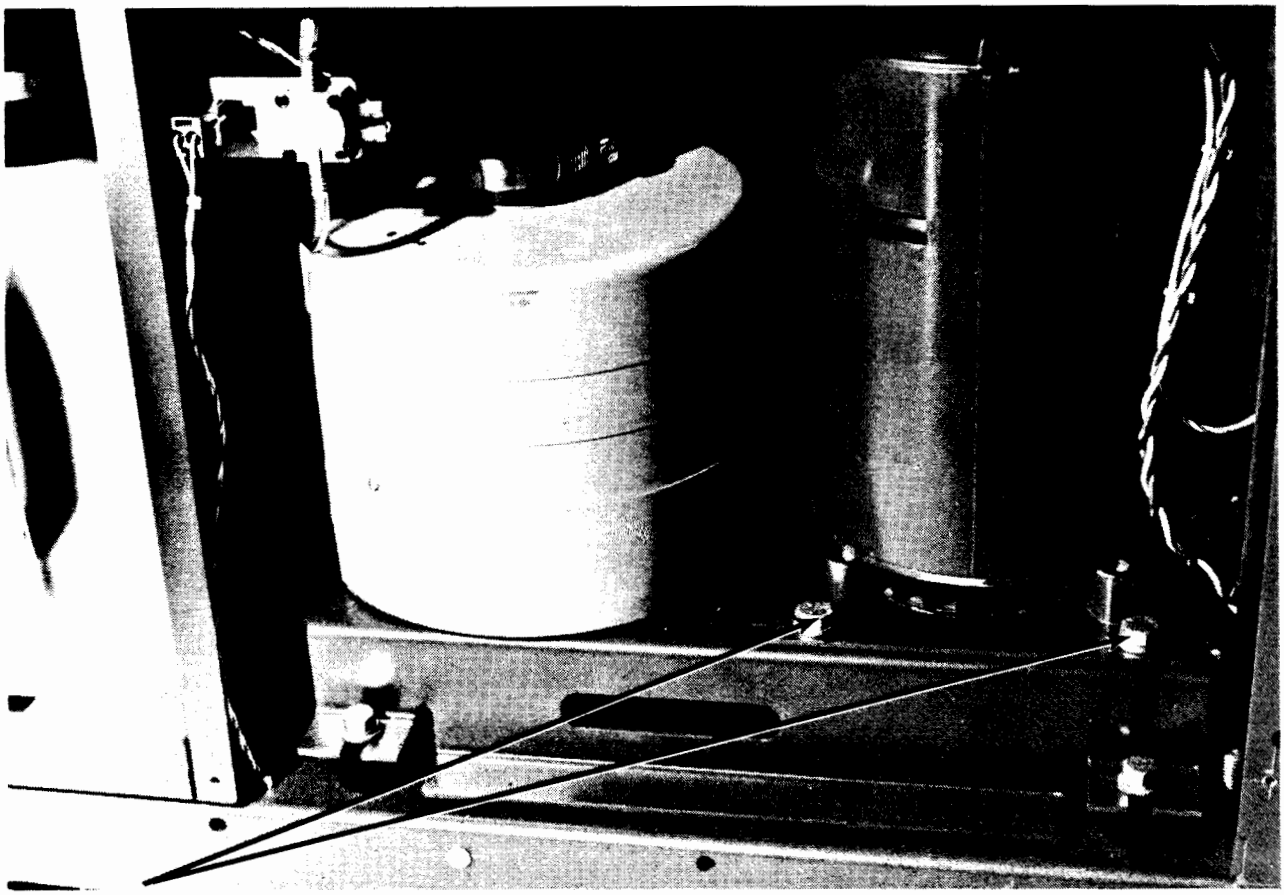
A. Set the Front ON/OFF switch and the rear MAIN POWER breaker to OFF.

B. Open the printer top cover and front door.

C. Remove the printer's right side outer panel. Two quarter turn fasteners are located on the inside of the end rails. The front fastener is located behind the toner hopper, and the rear fastener is exposed whenever the rear panel is removed.

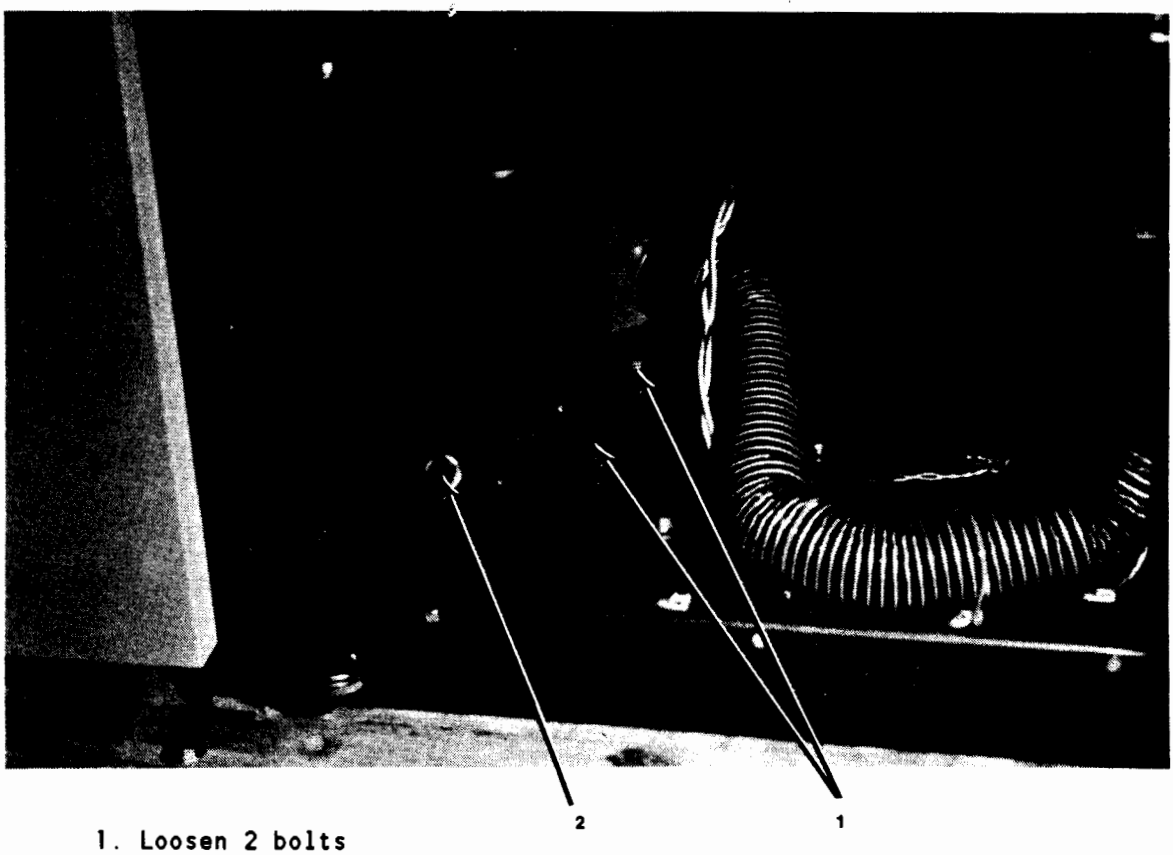
D. Remove the vacuum system lower cover panel. The screws are located as shown in Figure 4-99.

E. Loosen the four bolts located around the base of the vacuum motor (see figures 106 and 107). Do not confuse these bolts with the four bolts used to mount the vacuum cleaner assembly in the printer.



1. Loosen 2 bolts

Figure 4-102. Vacuum System (Front View).



1. Loosen 2 bolts
2. Tension adjustment bolt

Figure 4-103. Vacuum System (Right-side View).

F. To tension the belt, turn the tension adjustment bolt clockwise until the belt is tight (tension is correct when the belt deflects approximately 1/4 inch in the center of its span).

NOTE

Ensure that the belt has not been tensioned to the limits of its adjustment; that is, the bolts are not at the extreme ends of the slotted holes.

G. Tighten the four bolts at the base of the vacuum motor.

H. If the full range of adjustment on the belt has been reached and the tension is still not acceptable, remove the vacuum cleaner assembly as described in the replacement procedures in this chapter of the manual and replace the belt.

I. Re-install all panels and covers.

J. Close the top cover and front door and continue normal operation.

4-54. WEB TENSION (PULLEY & BELT REPLACEMENT)

To replace the pulleys and belt, proceed as follows:

WARNING

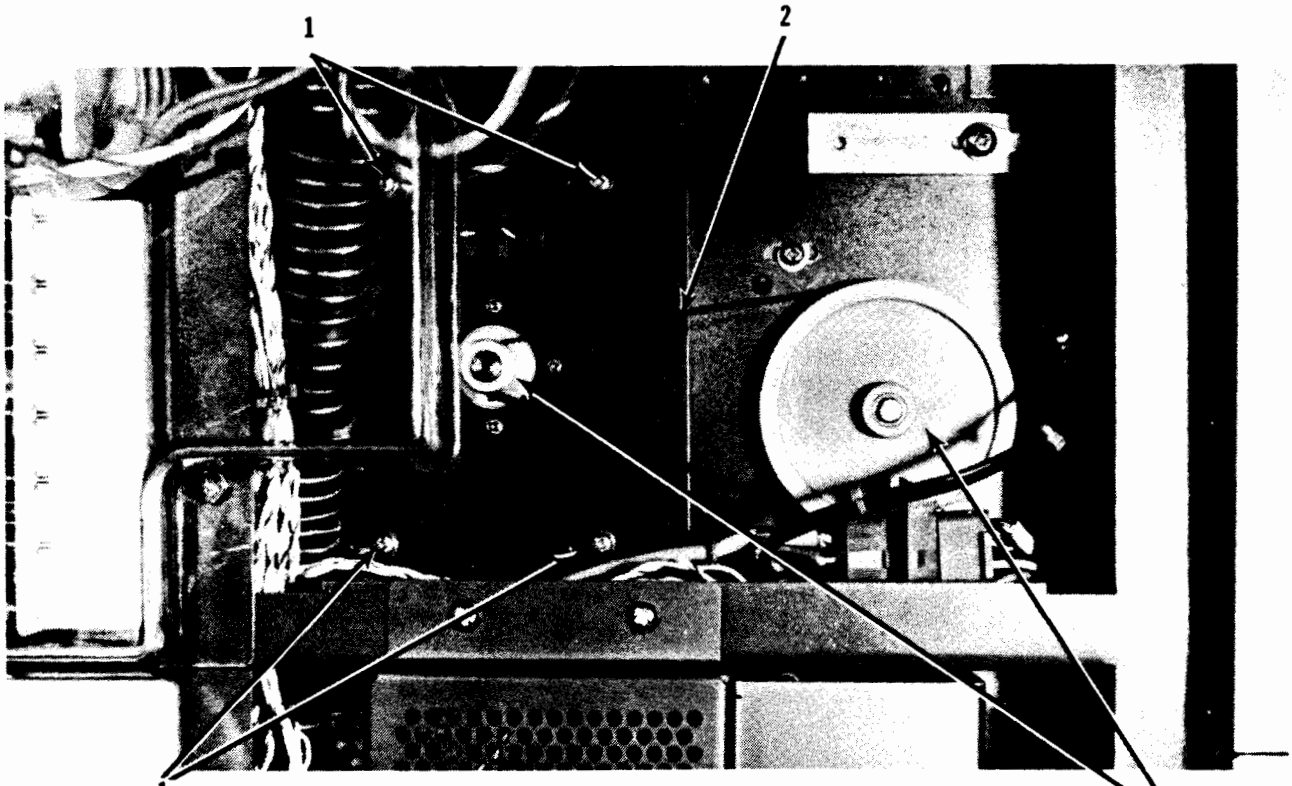
Set the rear MAIN POWER breaker to OFF. Hazardous voltages or moving mechanical parts could be encountered if the printer remains in an operating condition.

A. Set the rear MAIN POWER breaker to OFF.

B. Remove the printer rear panel.

C. Remove the high voltage shield (clear plastic cover).

D. Loosen the four screws on the tension drive motor bracket (see Figure 4-104) and slide the bracket to the right.



1. Loosen 4 bracket screws
2. Drive belt
3. Pulley

Figure 4-104. Web Tension Pulley and Belt.

E. Remove the drive belt from the two pulleys.

F. Using a 1.5 mm internal hex driver (allen wrench) loosen the two set screws on the small pulley and remove the pulley from the printer.

G. Using a 2 mm internal hex driver (allen wrench) loosen the two set screws on the large pulley and remove the pulley from the printer.

To install new pulleys and the belt, reverse the above procedure. Ensure that the tension drive motor bracket is pulled to the left to tension the belt before tightening the mounting screws. The two pulleys should be parallel to each other before tightening the pulleys on the shaft.

4-55. WEB TENSION ASSEMBLY REPLACEMENT

The web tension shaft bearings are press-fit into the right and the left end plates of the web tension assembly. The whole web tension assembly can be replaced or the just the bearings, pinwheels, friction wheels, paper strippers or springs can be replaced.

A. Set the rear MAIN POWER breaker to OFF.

B. Open the PAMM door and the printer top cover.

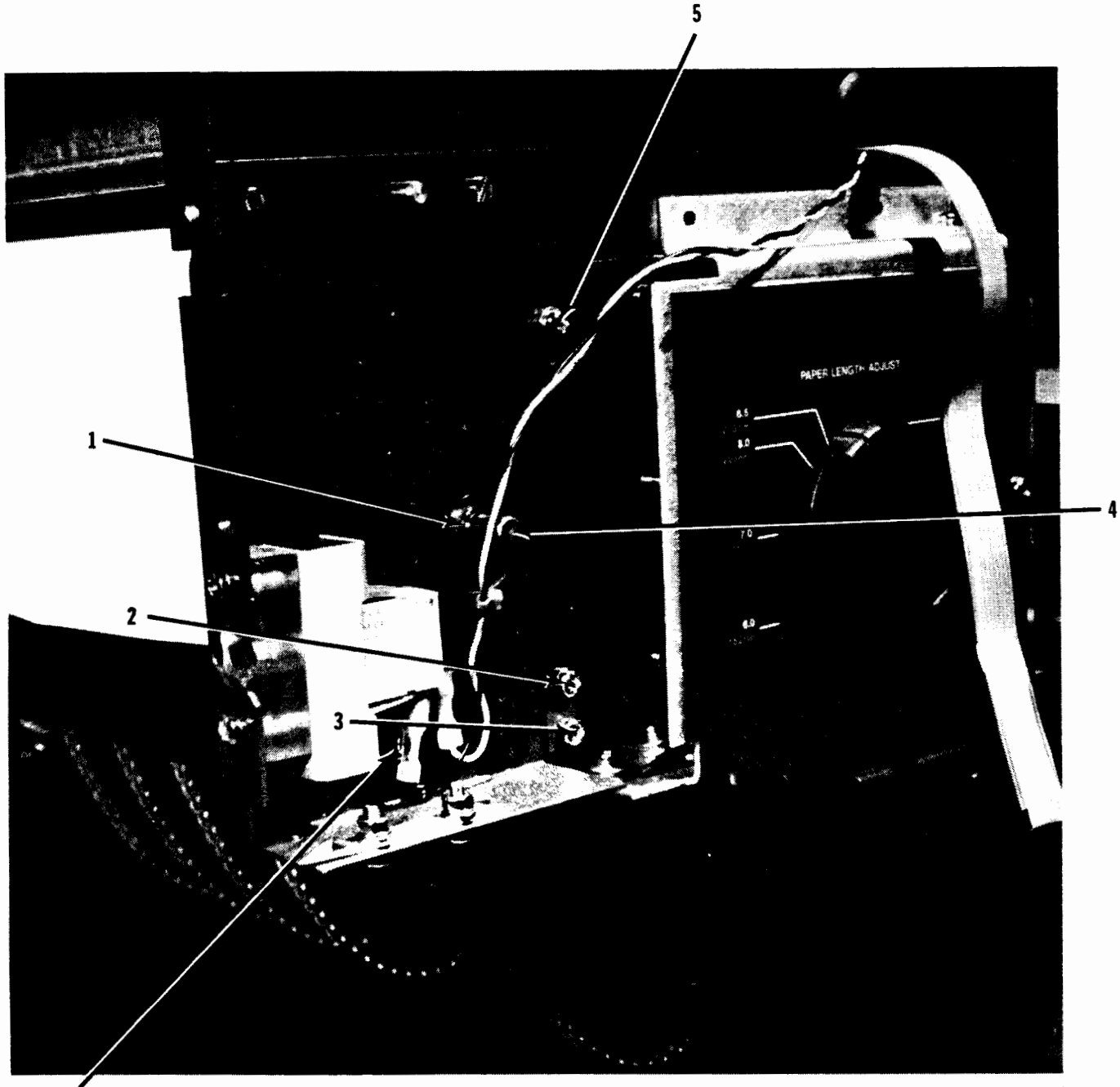
NOTE

When the paper control panel bezel is removed, do not pull hard. The panel is still connected to the printer by a cable inside the bezel.

C. Remove the five screws which mount the paper control panel bezel. The screws are located around the bezel as follows: one screw on the lower left side, one screw each on the right and left bottom sides, and two screws on the top side (see Figure 4-4, section 4-6).

D. Disconnect the ribbon cable from inside the bezel.

E. Remove the E-ring from the front end of the web tension shaft (see Figure 4-105).



1. E ring
2. Mount rod screw
3. Exit guide chute screw
4. Web tension shaft
5. DO NOT LOOSEN SCREWS!

Figure 4-105. Web Tension Assembly (Front View).

F. Remove the two front screws which support the mount rod and the exit guide chute (Figure 4-105). Remove the three rear screws which support the mount rod and exit guide chute assemblies (Figure 4-106) and allow the assemlies to dangle by the ground wire.

CAUTION

Do not remove the web tension adjustment screws shown in Figures 4-105 and 4-106. The screws are glyptolled at the factory to preserve a critical factory alignment.

G. Remove the E rings on both sides of the front output pinwheel.

H. Loosen the tractor clamp release knob.

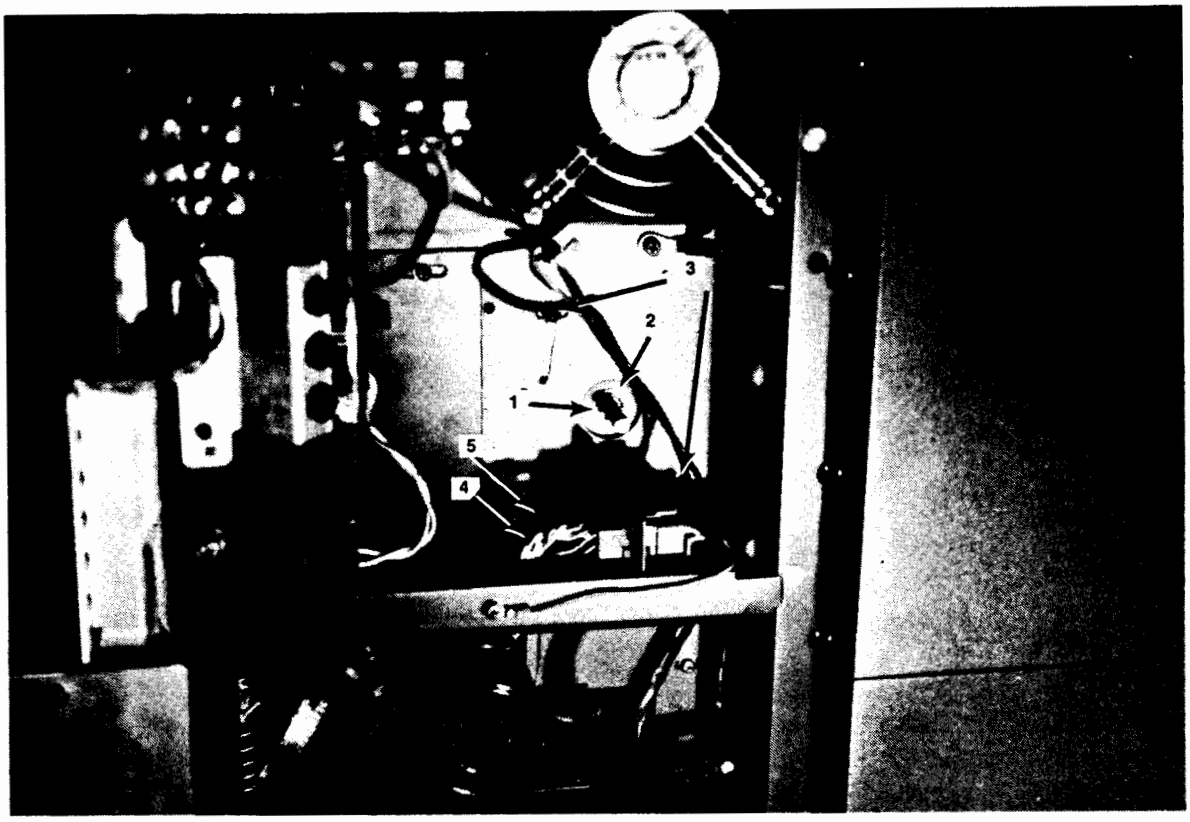
I. Remove the high voltage shield shown in Figure 4-104.

J. Loosen the four screws on the tension drive motor bracket (Figure 4-104) and slide the bracket to the right.

K. Remove the belt from the two pulleys.

L. Loosen the locking screw from the rear pinwheel.

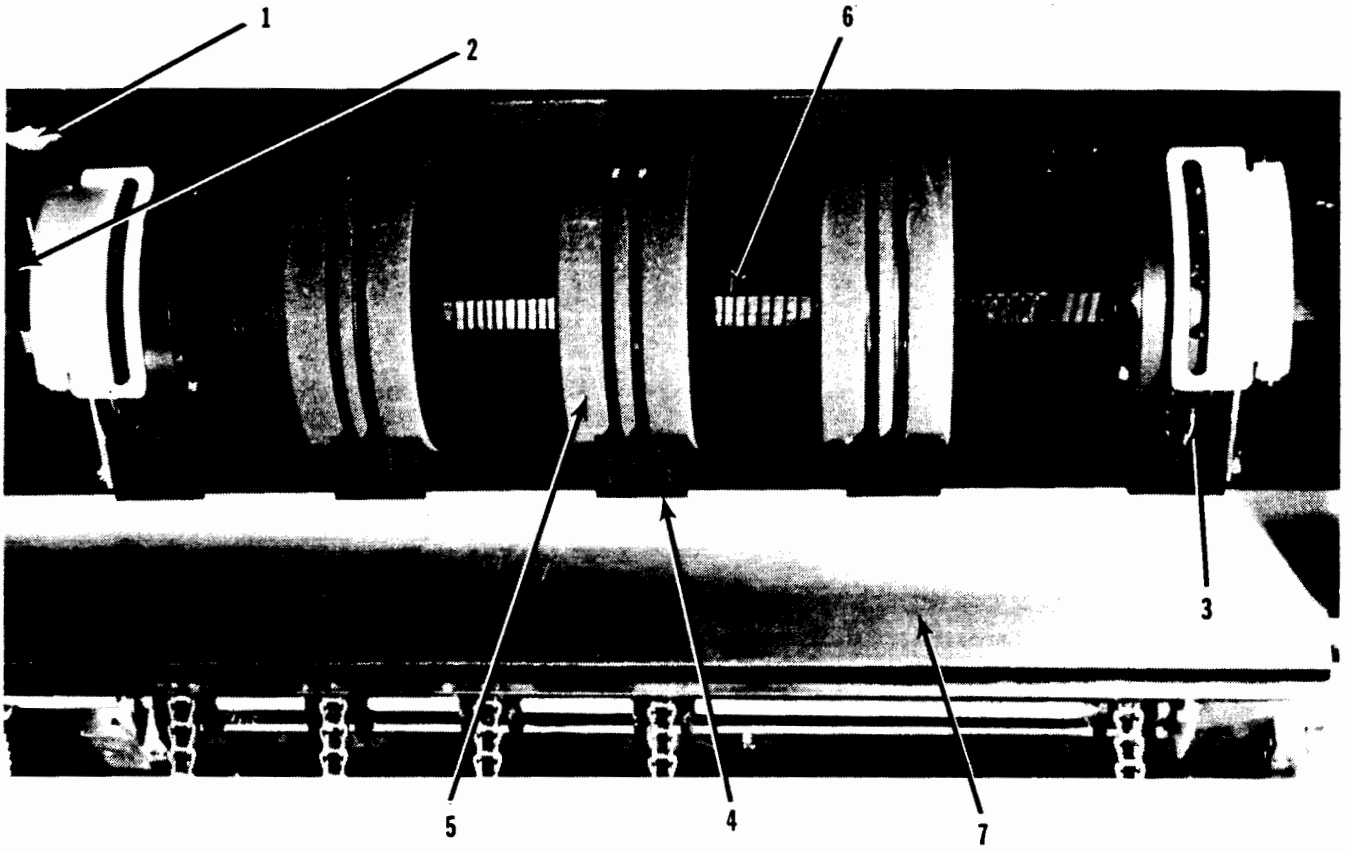
M. Remove the E rings on the rear web tension shaft and gently tap on the shaft from the back with a soft-faced mallet to remove the front bearing. (Or tap on the front to remove the rear bearing). The entire assembly can now be removed.



1. E ring
2. Bearing
3. DO NOT LOOSEN SCREWS!
4. Exit guide chute screw
5. Mount rod screw

Figure 4-106. Web Tension Assembly (Back View).

N. Note the positions of the wheels and springs on the web tension shaft; they must be installed exactly as removed. Slide these parts off the shaft (Figure 4-107).



1. Tractor clamp
2. Bearing
3. Output pinwheel
4. Paper stripper
5. Friction wheel
6. Spring
7. Exit guide extrusion

Figure 4-107. Output Shaft Assembly.

O. Reinstall the new parts, reversing the removal procedure. Do not forget to install the springs; also, remember that the friction wheels and paper strippers must be installed simultaneously.

TOP-OF-STACK SWITCH INSTALLATION INSTRUCTIONS

(KIT #02682-67010)

02682-90942
4/88

HEWLETT PACKARD

INTRODUCTION

The top-of-stack (TOS) switch operated by the flapper motor commonly wears out because of mechanical wear and internal contamination. This kit consists of a new type of switch and mechanism. The new switch is activated by the presence of a magnetic field and is hermetically sealed so mechanical wear and contaminants (such as paper dust) should not cause it to fail. In the old mechanism the switch was also the mechanical stop. A separate stop will be added to protect the new switch mechanism.

Two other causes of "Stack Safety Switch" error messages have recently been discovered. WORN FLAPPER ARMS (02682-40029 - See figures on pages that follow.) WILL CAUSE "STACK SAFETY SWITCH" ERRORS and poor stacking. If an arm does not have a full radius on the tips then it should be replaced. Anything that causes the elevator to hesitate or run slowly will also cause such messages. Once a stacker switch is hit the activating condition must be cleared within 2 seconds or a "Stack Safety Switch" error will occur.

PARTS PROVIDED:

NOTE

Re-use miscellaneous hardware originally in the printer or use duplicate hardware included in the kit for convenience.

ITEM#	DESCRIPTION	PART NUMBER	QUANTITY
2	MICROSWITCH: REED	02682-60677	1
3	SCR:2-56X.375 LG	0520-0130	2
4	WSHR-LK HLCL #2	2190-0045	2
5	ARM:FLAPPER SW	02682-00912	1
6,11	SCR-MACH M3X10LG	0515-0925	4
7,12	WSHR:M3 SPL LOCK	2190-0584	4
8	SPRNG-EXT.312"D	1460-1832	1
9	BUMPER:TOS LIMIT	02682-20562	1
10	POST:TOS LIMIT	02682-20563	1
13	WSHR:M3 FLAT	3050-0891	2
14	MNT:CBL-T.375X.75	1400-0786	1
15	TIE:CBL SMALL	1400-0249	1
16	SHUNT:TOS SW ADJ	02682-00918	1

TOOLS REQUIRED:

#2 POZIDRIVE
2.4mm (3/32") HEX KEY
#1 POZIDRIVE
#0 X 2" PHILLIPS
9.5mm (3/8") OPEN END WRENCH
1/4" X 5/4" STUBBY PHILLIPS
SPRING HOOK
NEEDLE NOSED PLIERS
SIDE CUTTERS

INSTALLATION:

Installation should require about 35 minutes.

1. Set the rear breaker to the "off" position.

2. Remove the flapper motor access panel.

3. Refer to figures. Item numbers in figures will appear in parentheses in instructions. Loosen the allen head screw in the collar (1) with a 2.4mm (3/32") hex key.

4. Pull the motor gently to the right until it separates from the shaft.

5. While leaving the motor tethered by its wiring rotate the motor/arm assembly to gain comfortable access to the screws that secure the arm to the motor. Detach the spring from the arm. Remove the screws and set the arm aside.

6. Remove the hardware that secures the cable tie mount for the motor capacitor to the flapper box.

7. Peel off the adhesive backed rubber limit bumper and set it aside.

8. Remove the switch mounting screws, unplug the switch and set it aside.

9. Attach the switch terminals to the new kit switch (2).

NOTE

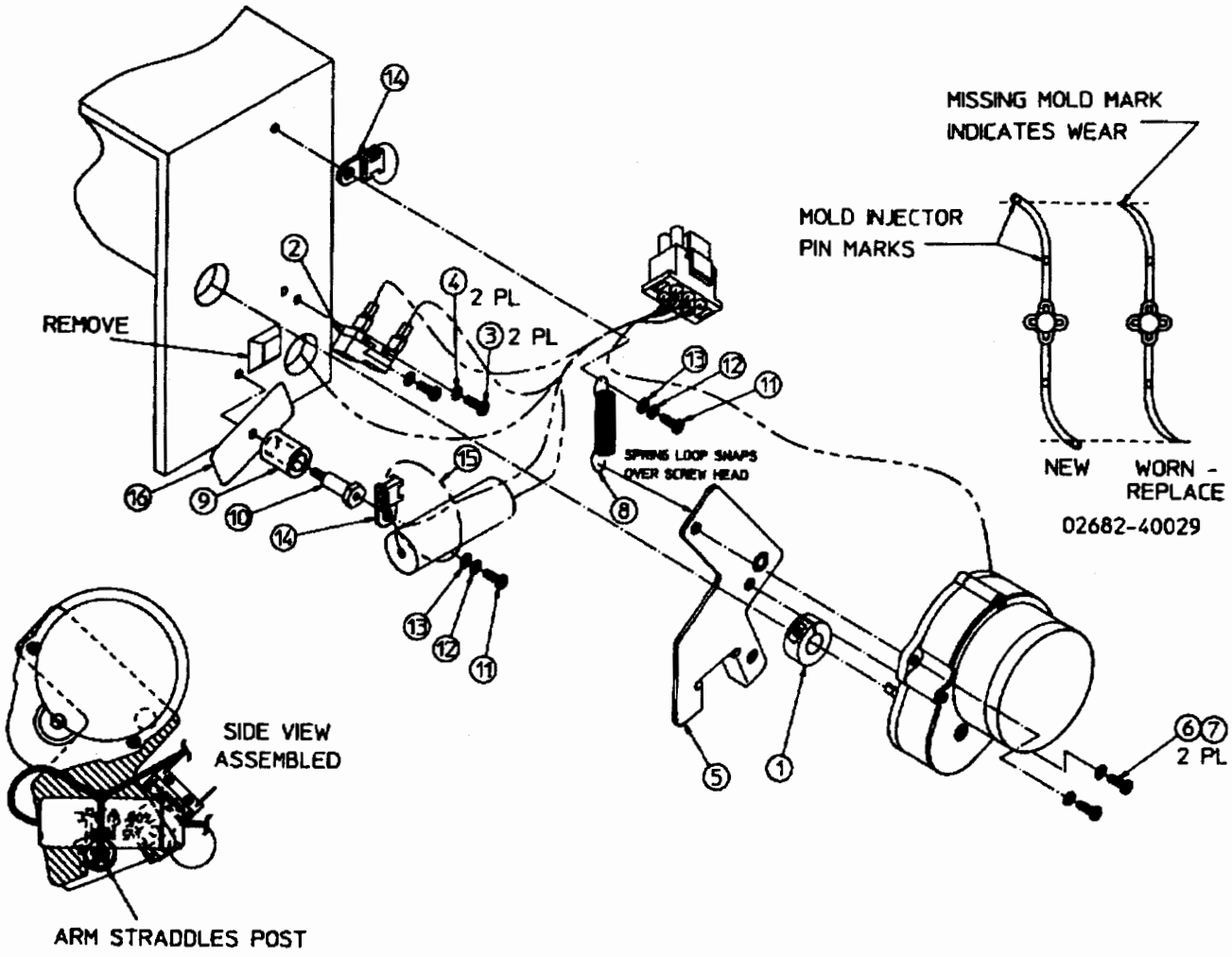
If the switch terminals are loose squeeze them closed with pliers then re-attach the switch.

Optionally, the wires can be soldered to the switch if care is taken so as not to overheat the switch terminals. Excessive heat can damage the switch internally.

Next, mount the switch with the #2 screws (3) and split washers (4) in the same position as the old switch. Since the new switch system does not require as much mechanical strength the switch mounting screws in the kit are shorter and easier to install than those formerly used in printers.

10. Attach the arm (5) from the kit to the motor with M3 screws (6) and split washers (7). The arm must be oriented as shown in the figures.

11. Snap the spring (8) loop over the screw head to attach the spring to the arm.



Top-of-Stack Switch Mechanism

12. Reconnect the motor to the shaft and secure it by tightening the collar screw. Ensure that the collar does not rub on the flapper box or motor.

13. Slide the kit bumper (9) over the post (10) and loosely pre-assemble the M3 screw (11), split washer (12), flat washer (13), cable mount (14), and the cable tie (15) as shown in the figures. Insert the pointed end of the cable tie into the cable tie buckle end just far enough to prevent it from slipping out.

14. Thread the bumper post assembly through the hole in the shunt (16) and into the hole vacated by the capacitor cable tie mounting hardware. Hold the shunt so that one end is centered under the magnet with the motor/arm/ magnet assembly in the rest position and tighten the bumper post so that the shunt is clamped between the flange on the post and the side of the flapper box. Ensure that the post is tight and that the shunt can't twist.

15. Hold the wire from one end of the capacitor against the component body and insert the capacitor and wire midway into the cable tie as shown in the figures, then cinch in the cable tie and cut off the excess.

16. Rotate the cable tie mount on the post screw to a position where the wires are not stressed and nothing interferes with motion of the motor/arm assembly, then tighten the cable tie mounting hardware.

17. Restore power to the printer. If the elevator lowers when the contactor closes then the shunt is too close to the magnet or the magnet is too far from the switch. The system is too sensitive. Inspect and adjust (See Adjustments section at the end of the Installation procedure.) the assembly as required.

18. Momentarily push back on the top of the motor to test the switch. As the motor/arm assembly rotates the magnet will be moved away from the switch. The printer should respond by lowering the elevator about half an inch. Release the motor to allow it to rotate back to its normal position. The magnet should come to rest near the switch thus closing the internal switch contacts and causing elevator motion to stop. If the motor is held back for more than 2 seconds the contactor should open and "Stack Safety Switch" will be displayed.

    If the top of the motor can be pushed until arm travel is limited by the post and the printer does not respond then the shunt is too far from the magnet or the magnet is too close to the switch. The system is not sensitive enough. Inspect and adjust (See Adjustments section at the end of the Installation procedures.) the assembly as necessary.

19. With the contactor closed use the device on command 795 in CE access level and observe the flapper motor. Ensure that as the motor rotates and wobbles slightly nothing can interfere with the rotation of the motor/arm assembly and that the arm doesn't rub on the side of the flapper box.

20. Once satisfied with all the test results; replace the access cover, check again, and then restore printer to normal operation.

21. Observe the operation of the flappers while printing.

    If the flappers stop without pushing the paper under the compaction bars on the front face of the flapper box then the Top-of-Stack sensing system may be too sensitive, indicating the shunt is too close to the magnet or that the magnet is too far from the switch. Adjust the system per instructions given in the Adjustments section that follows this Installation procedure.

    If the flappers never stop and the elevator never lowers unless the flappers are stopped manually then the system is not sensitive enough, indicating that the shunt is too far from the magnet or that the magnet is too close to the switch. Adjust the system per instructions given in the Adjustments section that follows this Installation procedure.

22. Retain all parts set aside and any remaining hardware so that if a problem occurs the printer can be restored to original conditions as a temporary repair or for diagnostic purposes.

ADJUSTMENTS:

Rarely should any adjustment be required. If an adjustment is needed it should only be necessary during initial installation unless parts are moved during subsequent service operations. Once all parts are secured periodic adjustments should not be necessary.

The tests in steps 17, 18, and 21 should help determine if the system is too sensitive or not sensitive enough.

There are 5 ways to adjust the interactions between the shunt, switch, and magnet. The first method is typically all that is required. If additional adjustments are needed, try steps 2, 3, 4, 5, one at a time and in that order.

1. Loosen the bumper post 1/6th of a turn so that the shunt can be rotated.

   To set the system for the most sensitive operation rotate the shunt until one end is centered under the magnet with the motor/arm/magnet assembly in the rest position.

   To set the system for the least sensitive operation rotate the shunt so that the ends are as far from the magnet in the rest position as possible.

   The shunt can be set at any position between the two limits described (these should be within about 90 degrees of rotation) to achieve the desired operating point.

   Hold the shunt in the desired position and re-tighten the bumper post. Ensure that the post is tight so that the shunt won't move when subjected to normal operating forces.

2. Loosen the screws that secure the switch and hold the switch either closer to or farther away from the magnet as required while re-tightening the screws.

3. The switch can be mounted with either the plain or printed side against the flapper box wall yet still be in the same orientation. The operating point can be changed by mounting the switch with the other side against the flapper box.

4. Loosen the collar that secures the motor to the shaft and slide the motor/arm magnet assembly 1 to 2 millimeters one way or the other as required. Moving the assembly to the right will move the magnet away from the switch. While holding the assembly in the proper position re-tighten the collar screw. Re-check for wobble and interferences per step 19.

5. By using a flat bladed screwdriver as a wedge and lever, the magnet can be rotated slightly around its rivet. Moving the magnet one way or the other will help adjust the system for proper operation.

SECTION IV.
SELF TEST EXPLANATION

DRUM POTENTIALS

	Typical Value	Default Value
Light target=	0	0
Dark poten.=	140 - 175	-
Doc poten DD=	140 - 175	-
Doc poten LD=	140 - 175	-
Dark target=	160 - 175	175

All drum potentials are measured by the electrostatic monitor. The electrostatic monitor is a non-contact voltmeter which can measure the drum potential without disturbing the existing charge on the drum surface. The electrostatic monitor measurements are used in the ESM algorithm (see figure 1) to regulate the current applied to the primary and simultaneous corona assemblies. The current applied to the corona assemblies in turn determines the drum's charge.

$$\text{New Primary Corona Setting} = \text{Old Primary Corona Setting} + \text{ES Loop Matrix Constant} \times \text{Dark Potential Target} - \text{Dark Potential Measured}$$

$$\frac{/}{/\ 250} + \text{ES Loop Matrix Constant} \times \text{Light Potential Target} - \text{Light Potential Measured} \frac{/}{/\ 250}$$

$$\text{New Simultaneous Corona Setting} = \text{Old Simultaneous Corona Setting} + \text{ES Loop Matrix Constant} \times \text{Dark Potential Target} - \text{Dark Potential Measured}$$

$$\frac{/}{/\ 250} + \text{ES Loop Matrix Constant} \times \text{Light Potential Target} - \text{Light Potential Measured} \frac{/}{/\ 250}$$

Figure 1. ESM Algorithms

To aid in making the drum potential measurements an electrostatic monitor mark is written during alternate drum rotations in the inter-document zone of the drum. This provides an alternating sequence of light (laser exposed) and dark (non-laser exposed) areas on the drum surface.

During Self Test several drum potential measurements are taken in the document region of the drum area and are used for diagnosing the drum's condition. These areas consist of a dark potential (unexposed) area, a light potential (exposed) area and two areas which alternate between light and dark every twenty rotations. The drum potential parameters and their definitions follow:

Light poten = XX — The "Light potential" measurement is taken when a light (exposed) area of the inter-document region of the drum is opposite the monitor. This measurement is used in the ESM algorithm to adjust the primary and simultaneous corona current.

Dark poten = XXX — The "Dark potential" measurement is taken when a dark (unexposed) area of the inter-document region of the drum is opposite the monitor. This measurement is used in the ESM algorithm to adjust the primary and simultaneous corona current.

Doc poten LL = XX — The "Document potential light after light" measurement is taken when a light (exposed) region in the document area of the drum is opposite the monitor.

Doc poten DD = XX The "Document potential dark after dark" measurement is taken when a dark (unexposed) region in the document area of the drum is opposite the monitor.

Doc poten LD = XX and Doc poten DL = XX The "Document potential Light after Dark" and Dark after Light measurements are taken in the document region of the drum. These areas alternate between light (exposed) and dark (unexposed) every 20 drum rotations. Doc poten LD is the alternating area which is currently dark and Doc poten DL is the area which is currently light. The purpose of this alternation is to measure ghosting effects.

Light target = X This is the light potential set-point for the electrostatic control loop. Under normal circumstances the light potential measured is compared to light target every other drum rotation. The primary and simultaneous corona settings are adjusted in order to maintain the light potential reading equal to the light potential target. The light target should be zero (the drum potential in an area exposed to the laser should be approximately zero volts).

Dark target = XXX This is the dark potential set-point for the electrostatic control loop. Under normal circumstances the dark potential measured is compared to the dark target every other drum rotation. The primary and simultaneous corona settings are adjusted in order to maintain the dark potential reading equal to the dark potential target. The dark potential target is normally set to 175 and then incrementally adjusted down in 5 count increments until carry-out is minimal.

DEVELOPMENT PARAMETERS

	Typical Value	Default Value
Solid rfl avg=	200 - 450	...
Devel. level=	100 - 150	...
Avg reflctnce=	230	...
Clean Drum=	650 - 700	...
Cln drum intv=	500	500
Duty Cycle	-	-
TDuty Cycle	-	-
Developer Var	-	-
Dens Target	1-10	1
CEOffset	1-4	2
VDP Flag	1,2	2

The development parameters measure print quality in terms of "blackness" of the print image created on the photoconductive drum's surface. Reflectance, the amount of light reflected from drum surface, is used as the basis for determining development parameters.

The heart of the reflectance control system is the densitometer assembly. The densitometer consists of an infrared light source and two light detectors. The first light detector is used to control the gain and output of the light source; the second detector measures the actual light reflected from the drum's surface. To aid in the reflectance testing, a densitometer mark (three bar pattern) is written on the drum's surface. The pattern consists of three bars of a solid developed print image interspersed with three nondeveloped bars. As this pattern moves under the densitometer several measurements are taken of each developed bar. These measurements are then averaged and compared with a clean drum measurement stored in the printer's non-volatile memory. Other reflectance measurements, the solid reflectance

process mark and the clean drum measurements are taken at periodic intervals and are used in diagnosing and monitoring the drum's developmental parameters. The drum development parameters and their definitions follow:

Reflectance= XXX Reflectance is measured once per printed drum rotation when the densitometer pattern passes under the densitometer. The measured reflectance is calculated and compared with the reflectance previously measured and stored in non-volatile memory. From the reflectance measurement the decision is made whether to add toner to the developer assembly. If the reflectance measured is above the reflectance target, then toner is added to the developer assembly.

V Measure

Avg reflctnce=XXX The average reflectance is a average of the reflectance measured from the twenty most recent drum rotations since the last power-on reset.

Refl. target= XXX The reflectance target is the set-point to which the developed image reflectance is maintained. If the reflectance measured is above the target, toner is added to the developer. If the reflectance is below target no toner is added until the reflectance increases to the target value.

UDP Lamps reflectance target.

Devel level= XXX The developer volume level is the instantaneous measured level in the developer assembly as determined by the developer volume sensor.

100-150

Count of 85 with no Developer on sensor

Avg dev level=XXX The average developer level is an average of the developer volume level compiled during the twenty five most recent developer volume measurements.

Volume thresh=XXX The developer volume threshold is the set-point used to determine when carrier needs to be added to the developer assembly. When the developer level is less than or equal to the developer volume threshold, the "Carrier low" message is displayed and carrier should be added to the developer assembly.

Untrans solid=XXX The untransferred solid reflectance measurement occurs when a solid densitometer process mark is opposite the densitometer assembly. The value displayed is an average of six densitometer measurements of this control mark.

Above 350- Purge Developer

Solid rfl avg=XXX The solid reflectance average is a running average of the solid reflectance measurements. The average is calculated so that the most recent measurement is the most heavily weighted.

Solid rfl int=20 The solid reflectance interval is the frequency (in drum rotations) at which the solid reflectance measurement occurs.

How often untransmitted solids updated

Clean drum= XXX The clean drum parameter represents the reflectance of an undeveloped drum. This value is used for normalizing reflectance measurements and is automatically measured and updated on a regularly scheduled interval.

Cln drum intv=XXX The clean drum interval represents the interval (~~in thousand drum rotations~~) which the clean drum routine is performed. The clean drum routine is also performed prior to the execution of each Self Test.

Carr low intv=XX The carrier low interval represents the interval in drum rotations which the carrier

low diagnostic is inhibited once the "Carrier low" message has been reset. This interval allows the carrier time to be thoroughly distributed throughout the developer assembly. After this interval has elasped, the developer volume is checked once per drum rotation.

FIRMWARE AFTER 2418

Duty Cycle — Represents the duty cycle at which the toner hopper should operate to make up for the toner removed from the hopper on the previous rotation.

TDuty Cycle — Represents the accumulated amount of toner the toner hopper has yet to output to make up for the toner used. This is expressed in an integer (i.e. 10,000 equals the amount of toner that would be output by turning on the hopper for an amount of time equal to one drum rotation.

Developer Var — This is a measure of hopper efficiency for supplying toner at a given print density, for given page coverage (number of dots). ≈ 600-700

TURN ON CYCLES FOR 45,000 DRUM ROTATIONS

Dens Target — This represents the desired Density Target entered by the printer operator via the 50 keyboard command.

CEOffset — Since no two printers delivery identical print density output, this density offset allows the CE to "fine tune" the printers density output so that two printers, set at the same density target, to print more a consistent (identical) density output. Default CEOffset equals 2. Range = 1-4, Command = 250

VDP flag — This parameter indicates whether or not the printer is equipped with the variable density print firmware a one (1) means yes, a two (2) means it is not.

HIGH VOLTAGE SYSTEM

		Typical Value	Default Value
GENERATED BY MCP	Prim setting=	185 - 210	190
	Max prim set=	.....	255
	Simul setting=	80 - 150	80
	Max simul set=	.....	255
	Dev bias set=	.....	220 = 302 VDC
	Trfr setting=	.....	190
	Prim shield V= *	.....	...
FROM HIGH VOLTAGE ←	Meas. prim. I=	0 - 170	...
	Prim cor volt= **	.....	...
GENERATED BY XFORMER ←	Simltn cor I=	50 - 160	...
	Devel. volt.=	180 - 190	...
FROM HIGH VOLTAGE ←	Meas. trfr. I=	0 - 160	...
	Trft cor volt= ***	....	...

* The Primary Screen Voltage = (2/3 X Primary Setting) - 127 For setting between 127 and 255 counts.

low failure limit = less than 40 counts or 32 counts less than the desired primary screen voltage

high failure limit= greater than 32 counts above the desired primary screen voltage

** Primary Corona Voltage - Failure occurs when the voltage is measured at less than 128 counts.

*** Transfer Corona Voltage - Failure occurs when the voltage is measure at less than 100 counts.

FROM CONTROL

OPTICAL SYSTEM

GENERATED BY OPTICS PCA, RF DRIVER OR LASER

	Typical Value	Default Value
Beam setting	110 - 130	110 ← MODULATED POWER INPUT
RF power, on=	40 - 60	... ← MODULATED POWER OUTPUT
RF power, off=	0 - 5	...
1st ord beam=	90 - 130 *	IF ERRATIC, CHECK +12 VOLT SUPPLY

* An auto-laser calibration routine is incorporated in MCP firmware date code 2414 and later to maintain First Order Power target of approximately 90 counts.

DC POWER SUPPLIES

	Low	Nominal	High	
+5 reference	118	128	138	— TO MONITOR FOR A/D CONVERSION REFERENCE
+5 supply	118	128	138	— PD1
+12 Quiet Supply	188	204	220	← PD1
-12 Supply	188	204	220	— PD1
+28 supply	149	159	169	— BY PD2
Signal Ground	0	2	10	

AC POWER SUPPLIES

Line voltage	214	..	252	
Erase lamp current	33	44	...	} MEASURED BY TORROID ON AC POWER PCA
Overall exp current	33	44	...	
Purge pump current	21	48	...	
Hopper motor current	21	48	...	
Output fans current	81	180	...	
AC Loads off current	..	8	16	— ALTRIAC SHORT IF LOADS OFF AND CURRENT

CONTROL, MONITOR, AC POWER, MCP are involved in these measurements