TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

TOPOGRAPHIC SUPPORT SYSTEM INFORMATION SECTION MODEL ADC-TSS-13 NSN: 6675-01-105-5762

THIS MANUAL T0GETHER WITH TM 5-6675-324-14-2 SUPERSEDES
TM 5-6675-324-14 DATED 15 SEPTEMBER 1983

HEADQUARTERS, DEPARTMENT OF THE ARMY

3 SEPTEMBER 1985

WARNING

HIGH VOLTAGE is used in this equipment". DEATH ON CONTACT or severe injury may result if personnel fail to observe safety precautions.

Do not be misled by the term LOW VOLTAGE. Low voltage can cause serious injury or death.

Test procedures requiring the operator or maintenance personnel to investigate equipment or restore casualties with interlocks disconnected or covers removed may result in DEATH ON CONTACT if personnel fail to observe safety precautions.

Voltages in switches and circuit breaker panels may result in DEATH ON CONTACT if personnel fail to observe safety precautions.

Failure to ground the section or equipment may result in DEATH ON CONTACT if personnel fail to observe safety procedures.

For Artificial Respiration refer to FM 21-11.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Wear solvent-impermeable gloves and eye/face protective equipment when using solvent. Do not use near open flame or excessive heat. Flash point of solvent is 100° F to 138° F (38° C to 59°C).

WARNING

Rotating and spinning equipment may snag loose clothing, hair or jewelry resulting in SEVERE PERSONNEL INJURY.

WARNING

Attempting to move overweight or top heavy equipment that is unsecured may result in SEVERE PERSONNEL INJURY. Always have sufficient personnel and equipment to accomplish the task.

INTRODUCTION

This manual is divided into two volumes:

Volume 1, TM 5-6675-324-14-1 consists of Chapters 1 through 4 and Index 23.
Volume 2, TM 5-6675-324-14-2 consists of Chapters 5 through 10, Appendixes A through E, Glossary and Index.

The Appendixes and Glossary in Volume 2 are applicable to both volumes.

CHANGE
NO. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C.,14 April 1988

Operator's, Organizational, Direct
Support and General Support
Maintenance Manual

TOPOGRAPHIC SUPPORT SYSTEM
INFORMATION SECTION
MODEL ADC-TSS-13
NSN: 6675-01-105-5762

TM 5-6675-324-14-1, 3 September 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
1-1 and 1-2	1-1 and 1-2
1-19 and 1-20	1-19 and 1-20

2. Retain this sheet in front of manual for reference Purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-25A, Operator, Unit, Direct Support and General Support Maintenance requirements for Topographic Support Set, Semi Trailer Mounted, Distributing Section (ADC-TSS-3)

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 13 June 1986

Operator's, Organizational, Direct
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TOPOGRAPHIC SUPPORT SYSTEM
INFORMATION SECTION
MODEL ADC-TSS-13
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1-13 and 1-14	1-13 and 1-14
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1-61 through 1-64	1-61 through 1-64
1-71 and 1-72	1-71 and 1-72
1-97 and 198	1-97 and 1-98
1-101 and 1-102	1-101 and 1-102
3-67 and 3-68	3-67 and 3-68
4-11 and 4-12	4-11 and 4-12
4-79 and 4-80	4-79 and 4-80

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TECHNICAL MANUAL

NO. 5-6675-324-14-1

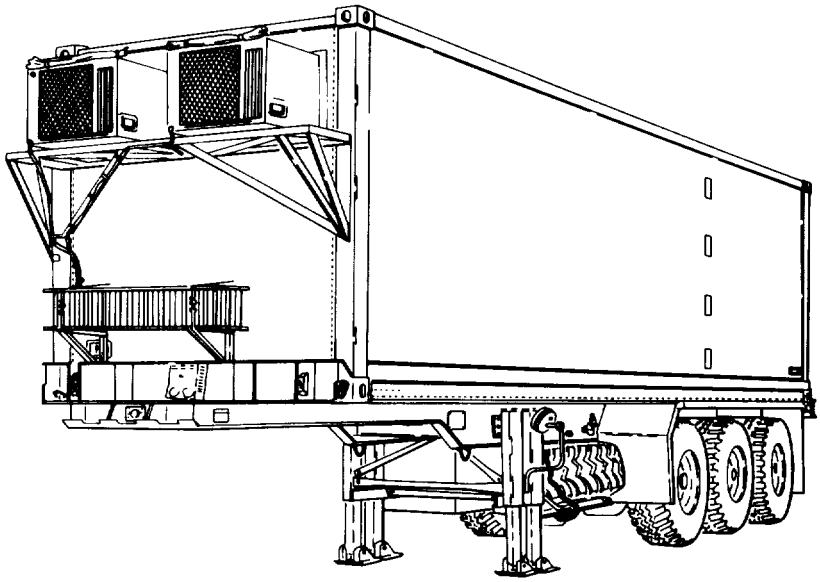
HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 3 September 1985

Operator's, Organizational, Direct Support and General Support Maintenance Manual

TOPOGRAPHIC SUPPORT SYSTEM
INFORMATION SECTION
MODEL ADC-TSS-13
NSN: 6675-01-105-5762

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of away to improve the procedures, please let us know. Mail your letter,DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Troop Support Command, ATTN:AMSTR-MCTS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will refurnished directly to you.



CHAPTER 1

INFORMATION SECTION

Section I INTRODUCTION

1-1. GENERAL INFORMATION.

1-1.1 Scope. This manual contains operating and maintenance instructions for the ADC-TSS-13, Information Section, Topographic Support System (TSS). The purpose of the Information Section is to catalog, store, and maintain military geographic information. The trailer chassis is covered in TM 5-2330-305-14, Operator, Organizational, Direct Support and General Support Maintenance Manual, Topographic Support System, Chassis, Semitrailer, IS0 Container Transporter. Repair parts and special tools are listed in TM 5-6675-324-24P, Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List, Information Section, Topographic Support System. Lubrication instructions are contained in LO 5-6675-324-12, Lubrication Order, Information Section, Topographic Support System. All authorized equipment, supplies, and their locations for transport are shown in Location and Description of Major Components of this manual.

1-1.2 Purpose of Equipment. To provide a transportable facility for the receipt, accounting, and storage of processed military geographic information and provide for the dissemination of information as required.

1-1.3 Maintenance Forms and Records. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, The Army Maintenance Management System (TAMMS).

1-1.4 Reporting Equipment Improvements (EIR's). If the Information Section needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you do not like about your equipment. Let us know why you do not like the design or performance. Put it on an SF 368 (Quality Deficiency Report)___ Mail... it to us at: U.S. Army Troop Support Command, ATTN: AMSTR-QX, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. we will send you a reply.

1-1.5 Destruction of Material to Prevent Enemy Use. For information on destruction of material to prevent enemy use, refer to TM 750-244-3, Procedures for Destruction of Equipment to Prevent Enemy Use.

1-1.6 Preparation for Storage or Shipment.

a. Perform your preparation for movement procedures.

b. For administrative storage of equipment, refer to TM 740-90-1.

c. The chapters of this manual describe special shipping instructions for major components located in the section.

d. In the event this equipment must be removed from the section for repair or replacement, contact your battalion for packing and shipping instructions.

1-2. EQUIPMENT DESCRIPTION.

1-2.1 Equipment Characteristics, Capabilities, and Features.

a. Air and sea transportable.

b. Transportable cross-country capability when mounted on trailer chassis.

c. Controlled internal environment,

1-2.2 Special Considerations.

a. Site must permit section to be leveled within ±2°, be well drained, and provide adequate overhead concealment. Wooded areas and other obstacles must not impede movement of transporters.

b. Dispersal of topographic sections is limited to the length of electric power transmission cable available for unit generators.

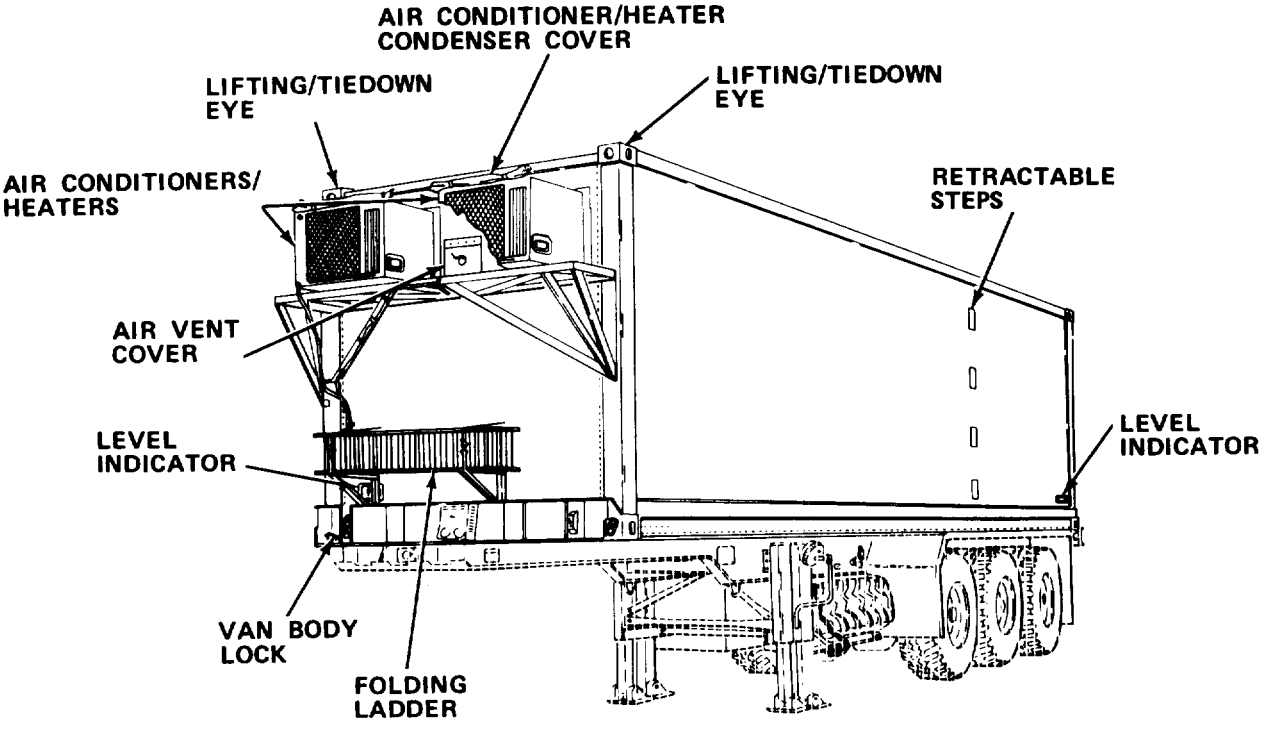
c. During site selection, avoid overhead power transmission lines to prevent danger from electric shock or electromagnetic interference.

d. Power is normally supplied by 60 kW generators. Commercial electric power should be used if it is compatible and available.

e. Cross-country capability of sections and transporters is limited. Relocation should be accomplished over hard-surfaced, all-weather roads whenever possible.

1-2.3 Location and Description of Major Components.

a. Roadside Exterior.



VAN BODY LOCK . Locks van body to trailer chassis.

AIR CONDITIONERS/HEATERS. Two air conditioner/heater units for internal environmental control.

LIFTING/TIEDOWN EYES. Attachment point for lifting or tying down van body.

AIR CONDITIONER/HEATER CONDENSER COVERS. Covers air conditioner/heater condenser to prevent water/air entering air conditioner/heater unit when in transport or storage.

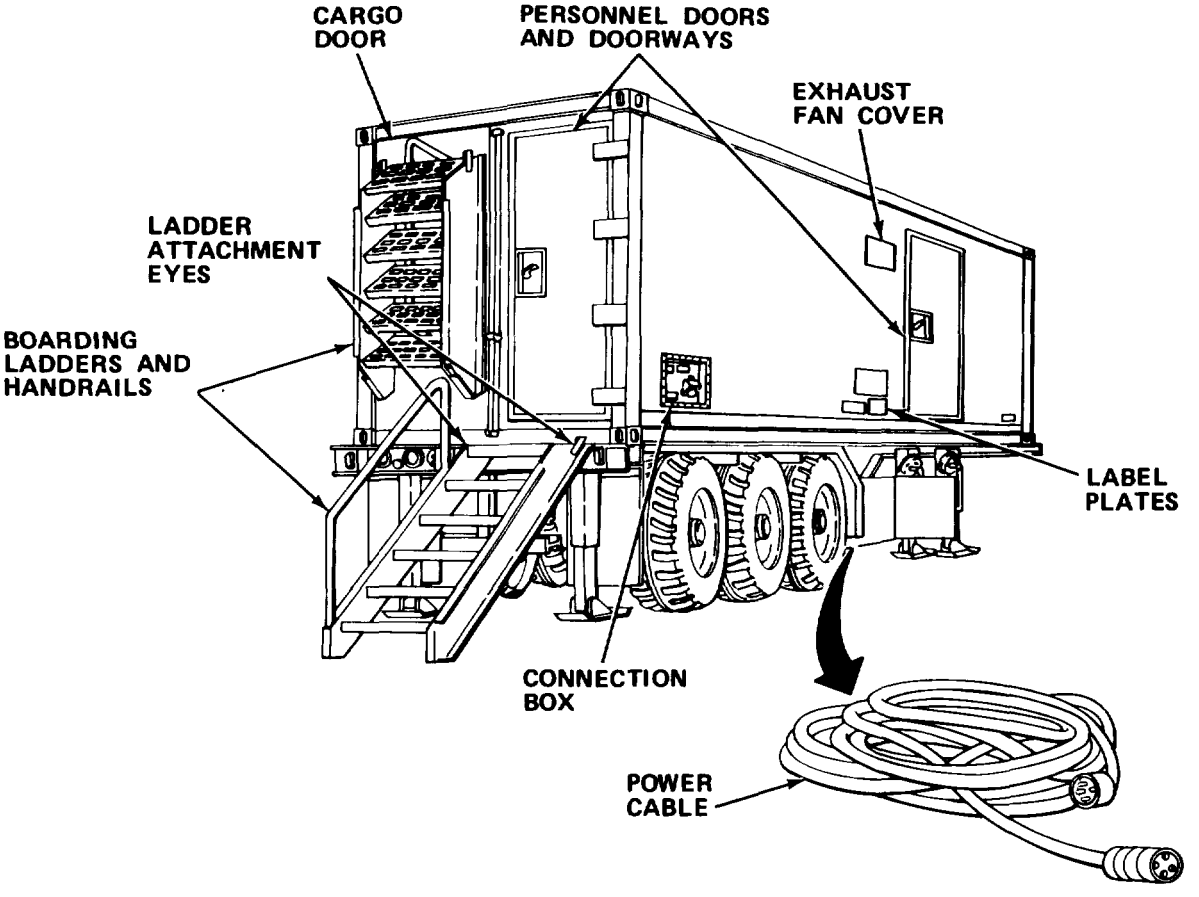
AIR VENT COVER. Covers air vent opening.

RETRACTABLE STEPS. Provide access to roof.

LEVEL INDICATORS. Indicate van body inclination.

FOLDING LADDER. Allows access to air conditioners and top of van.

b. Curbside Exterior,



CARGO DOOR. Access for equipment removal/installation.

PERSONNEL DOORS . Door is 35.75 in. (90.8 cm) wide by 86 in. (218.4 cm) high.

PERSONNEL DOORWAYS. Doorways are 30.75 in. (78.1 cm) wide by 78.5 in. (199.4 cm) high.

EXHAUST FAN COVER. Covers exhaust fan opening.

LABEL PLATES. Provide weight/moment data.

POWER CABLE. Power cable is in 50 ft (15.2 m) sections. (Stored in trailer chassis storage box.)

CONNECTION BOX. Contains terminals for ground cable, power cables, and telephone lines.

LADDER ATTACHMENT EYES. Attachment points for boarding ladder,

BOARDING LADDERS AND HANDRAILS. Provide access to section.

c. Interior.

PERSONNEL DOOR. Weatherproof, fitted with blackout switch.

BLACKOUT SWITCH. Turns ceiling lights ’off when activated.

FIRE EXTINGUISHER. Dry chemical fire extinguisher.

CARGO DOOR. Access for equipment installation/removal.

FIRST AID KIT. Limited first aid supplies.

WALL STORAGE CABINET: Storage.

FLUORESCENT CEILING LAMP. White, two-level (high/low) overhead light.

BLACKOUT DOME LIGHT. Red-lensed, white-lensed 12 V ac light actuated when blackout switch operates, or from external power.

STORAGE SHELVES. Provide additional space.

CHEMICAL STORAGE CABINET. For storage of miscellaneous chemicals.

MAP AND PLAN FILING CABINET. Storage for maps/topographic products.

COPIER. Plain paper copier.

ACCESSORY SHELF. Additional storage.

AIR CONDITIONER/HEATER. Internal environmental control.

FOLDING CHAIR. Additional seating.

EMERGENCY LIGHTS. Battery-powered lighting actuated by power failure.

AIR VENT. Permits filtered make-up air to enter section.

SECURITY MAP AND PLAN FILING CABINET. Storage of classified maps.

FILING CABINET. Storage.

BLACKOUT CURTAIN. Lightproof cover for personnel door.

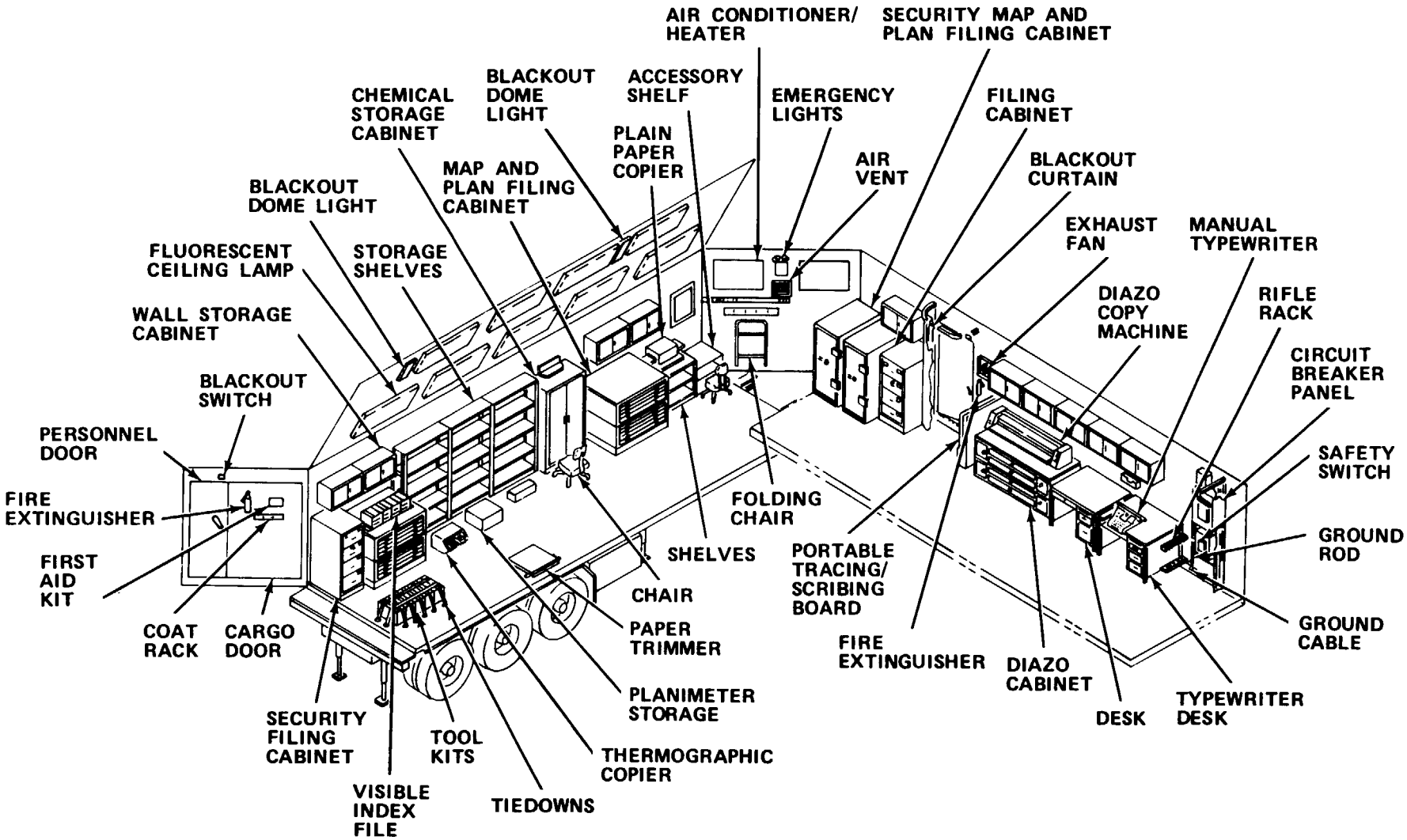
FIRE EXTINGUISHER. Dry chemical fire extinguisher.

EXHAUST FAN. Provides ventilation. Fitted with lightproof louvers and weatherproof cover.

DIAZO COPY MACHINE. Ammonia process copy machine.

MANUAL TYPEWRITER. Hide carriage.

RIFLE RACK. Weapon storage.


AIR CONDITIONER/ HEATER
SECURITY MAP AND PLAN FILING CABINET
CHEMICAL STORAGE CABINET
BLACKOUT DOME LIGHT
ACCESSORY SHELF
EMERGENCY LIGHTS
FILING CABINET
PLAIN PAPER COPIER
AIR VENT
BLACKOUT CURTAIN
MAP AND PLAN FILING CABINET
BLACKOUT DOME LIGHT
EXHAUST FAN
MANUAL TYPEWRITER
FLUORESCENT CEILING LAMP
STORAGE SHELVES
DIAZO COPY MACHINE
RIFLE RACK
WALL STORAGE CABINET
CIRCUIT BREAKER PANEL
BLACKOUT SWITCH
PERSONNEL DOOR
SAFETY SWITCH
FOLDING CHAIR
FIRE EXTINGUISHER
GROUND ROD
SHELVES
PORTABLE TRACING/ SCRIBING BOARD
FIRST AID KIT
CHAIR
GROUND CABLE
PAPER TRIMMER
COAT RACK
CARGO DOOR
FIRE EXTINGUISHER
DIAZO CABINET
PLANIMETER STORAGE
DESK
TYPEWRITER DESK
SECURITY FILING CABINET
TOOL KITS
THERMOGRAPHIC COPIER
VISIBLE INDEX FILE
TIEDOWNS

CIRCUIT BREAKER PANEL. Circuit breakers with phase test indicator.

SAFETY SWITCH. Main power safety disconnect switch.

GROUND ROD. Electrical ground for section.

GROUND CABLE. Used with ground rod.

TYPEWRITER DESK. Work station.

DESK. Work station.

DIAZO CABINET. Storage for bulk diazo supplies.

PORTABLE TRACING/SCRIBING BOARD. Illuminated board for tracing/scribing.

SHELVES. Used to store plain paper copier supplies.

CHAIR. Used at work station.

PAPER TRIMMER. Trims sheet paper.

PLANIMETER STORAGE. Storage for transport mode.

THERMOGRAPHIC COPIER. Copy machine using heat process.

TIEDOWNS. Stored inside storage cabinet when not in use.

TOOL KITS.

VISIBLE INDEX FILE. Rapid file access.

SECURITY FILING CABINET. Security storage.

COAT RACK. Coat storage.

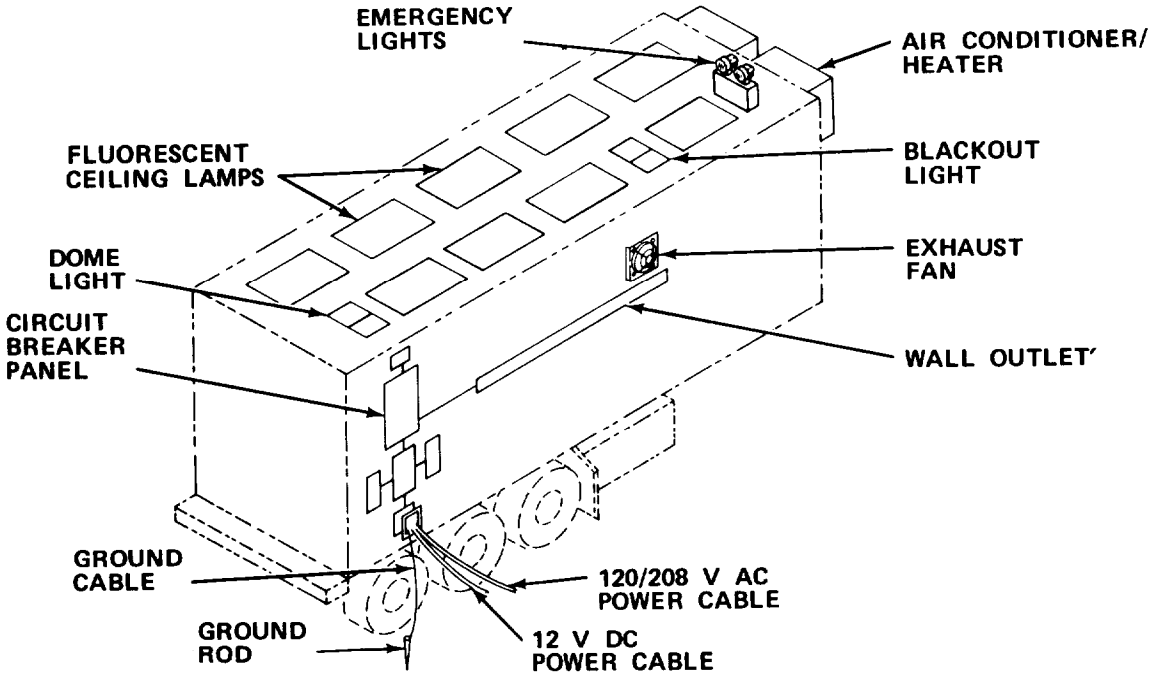
1-2.4 Equipment Data - IS0 Container (Unmounted).

Dimensions	
Length	33.66 ft. (10.26 m)
Width	8ft (2.44 m)
Height	8 ft (2.44 m)
Cubage	2038 ft^3 (57.7 m^3)
Connections	
Telephones	One telephone (three-post) connection
Power	15.0 kW. One 120/208 V, three-phase, four-wire connection and one 12 V dc connection
Ground	Ground lug
Air Conditioner/Heater (Two Units)	
Cooling	18,000 Btu/hr (5274 W) each
Heating	14,300 Btu/hr (4190 W) (Max) each
Power Requirements	208 V, 60 Hz, three-phase
Exhaust Fan	289 ft^3/min (8.18m^3/min)
Air Vent	289 ft^3/min (8.18m^3/min)
Weight	
Gross (Container and Chassis)	28,570 lbs (12,956.50 kg)
Tare (Container Only)	17,130 lbs (7768.46 kg)

1-3. TECHNICAL PRINCIPLES OF OPERATION.

1-3.1 General. The operation of major components located within the van are explained in the appropriate chapter for that equipment.

1-3.2 Electrical System.



GROUND ROD. Used to ground van body.

GROUND CABLE. Used with ground rod.

CIRCUIT BREAKER PANEL. Contains voltage indicator, phase monitor, and circuit breakers.

WALL OUTLETS. Provide grounded outlets for portable or plug-in equipment.

DOME LIGHTS. White-lensed, 12 V dc lights powered from external source. Separately switched and fused.

FLUORESCENT CEILING LAMPS. Two-level (high/low) overhead lights with blackout override switches.

EMERGENCY LIGHTS. Battery powered. Activated by power loss.

AIR CONDITIONER/HEATER. Air conditioner and electrical heater powered by three-phase, 208 V, 30 amp current.

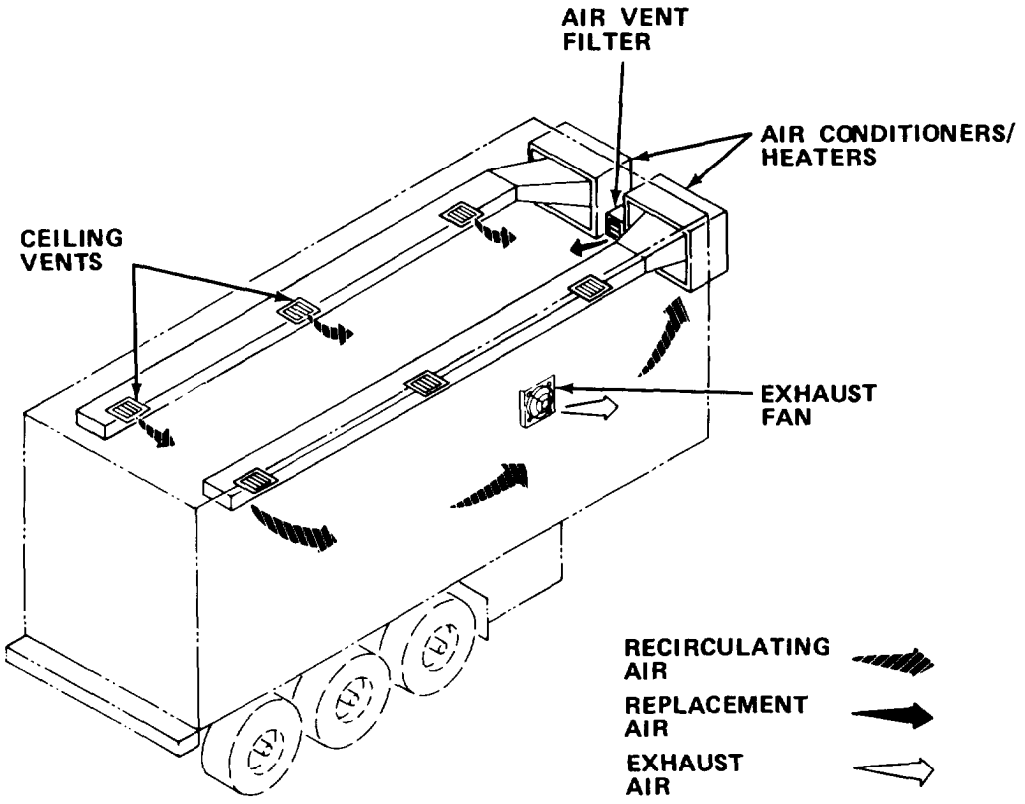
BLACKOUT LIGHTS. Red-lensed, 12 V ac lights actuated when blackout switch operates.

EXHAUST FAN. Plug-in fan. Separately fused.

POWER CABLES. Power input (120/208 V ac and 12 V de).

1-3.3 Wiring Diagram. A foldout wiring diagram is provided at the end of this manual.

1-3.4 Ventilation System.



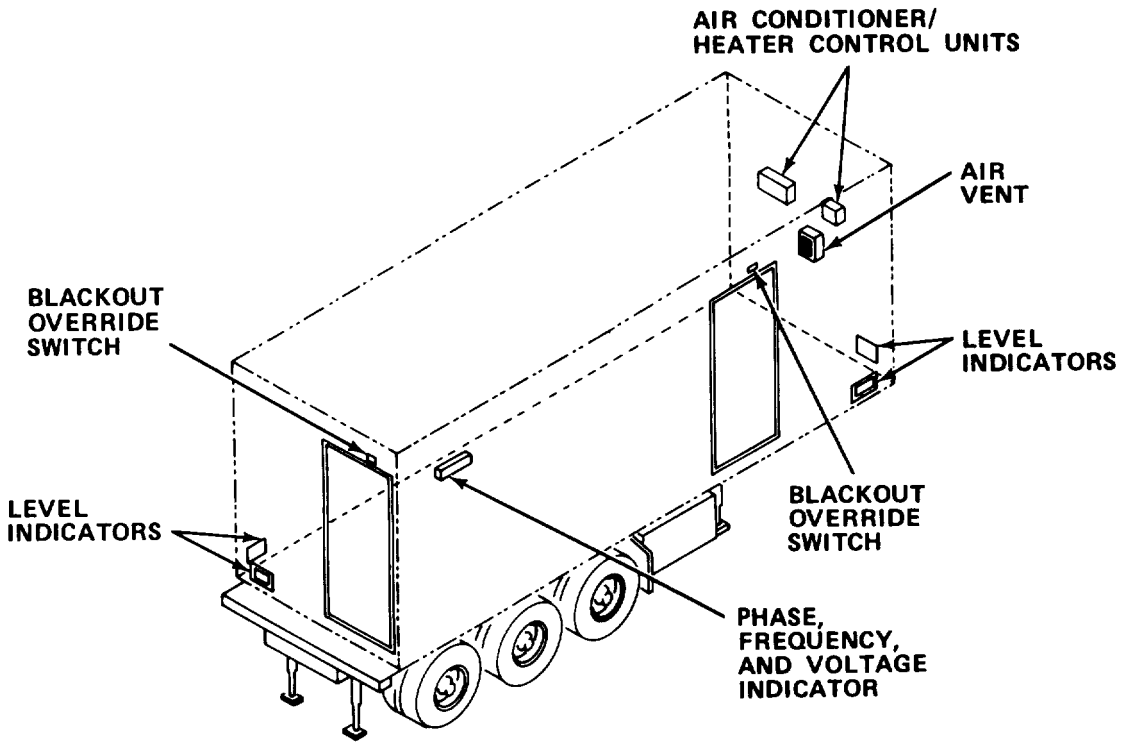
Exhaust fan exhausts air. Replacement air flows into the van body through the air vent filter. Recirculating air is filtered as it enters the air conditioners/heaters. From the air conditioners/heaters, it flows through the ceiling vents and into the van body.

NOTE

Detailed description of air conditioner/heater operation is contained in TM 5-4120-367-14, Operator, Organizational, Direct Support, and General Support Maintenance Manual, Air Conditioner, Horizontal, Compact, 18,000 Btu/hr Cooling, and TM 5-4120-367-24P, Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair) for Air Conditioner, Horizontal, Compact, 18,000 Btu/hr (5274W).

Section II OPERATING INSTRUCTIONS

1-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.



Control or Indicator	Function
Blackout Override Switches	Turn off illumination when doors are opened.
Air Vent	Permits make-up air to enter as required.
Air Conditioner/Heater Control Unit	Permits selection of air conditioner or heater mode of operation and temperature.
Phase, Frequency, and Voltage Indicator	Monitors electrical power, phase, frequency, and voltage.
Level Indicators	Used to level section.

1-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

a. Before You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your before (B) PMCS.

b. While You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your during (D) PMCS.

c. After You Operate. Be sure to perform your after (A) PMCS.

d. If Your Equipment Fails to Operate. Troubleshoot with proper equipment. Report any deficiencies using the proper forms. See DA Pam 738-750.

1-5.1 PMCS Procedures.

a. PMCS are designed to keep the equipment in good working condition by performing periodic service tasks.

b. Service intervals provide you, the operator, with time schedules that determine when to perform specified service tasks.

c. The “Equipment is Not Ready/Available If” column is used for identification of conditions that make the equipment not ready/available for readiness reporting purposes or denies use of the equipment until corrective maintenance is performed.

d. If your equipment fails to operate after PMCS is performed, immediately report this condition to your supervisor.

e. Perform weekly as well as before operation if you are the assigned operator and have not operated the item since the last weekly or if you are operating the item for the first time.

f. Item number column. Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your “TM Number” column on DA Form 2404, Equipment Inspection and Maintenance Worksheet in recording results of PMCS.

g. Interval columns. This column determines the time period designated to perform your PMCS.

h. Item to be inspected and procedures column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation Chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.

i. Equipment is not ready/available if: column. This column indicates the reason or cause why your equipment is not ready/available to perform its primary mission.

j. List of tools and materials required for PMCS is as follows:

Item	Quantity
Wire Brush	1 ea
6 in. Adjustable Wrench	1 ea
Flat Tip Screwdriver	1 ea
Vacuum Cleaner	1 ea
Cheesecloth (Item 7, Appendix E)	ar
General Purpose Detergent (Item 9, Appendix E)	ar
Paint (Items 17, 17A and 17B, Appendix E)	ar
Paint Brushes	ar

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

B - Before
D - During
A - After
W - Weekly
M - Monthly
Q - Quarterly
AN - Annually
S - Semiannually
BI - Biennially
(Number) - Hundreds of Hours

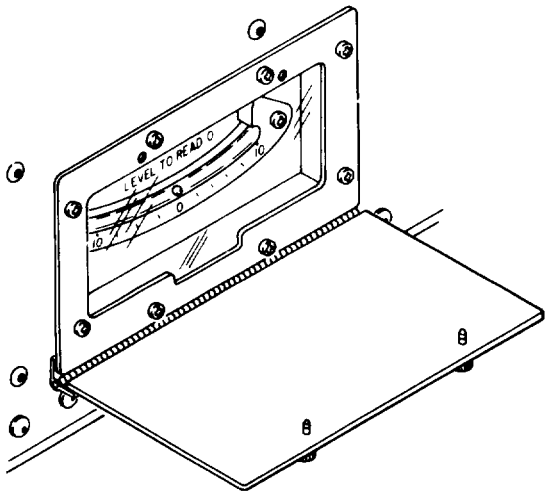
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		VAN BODY	
1		Inspect Exterior.	
	B/W	1. Inspect surfaces for punctures, cracks, or open seams that could permit moisture to enter wall.	Punctures, cracks, or open seams are present.
			
	B	2. Inspect four level indicators for damage and to check that section is level.	Indicators are broken.

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		VAN BODY - Cont	
1		Inspect Exterior - Cont	
		WARNING To prevent death or serious injury, do not handle or clean power cable or connectors when cable is connected to power source.	
	B	3. Inspect power cable assembly for dirt or damaged connectors. a. Wipe cable insulation with clean, dry cloth to remove dirt. b. Clean corrosion from terminals.	Connector damaged.

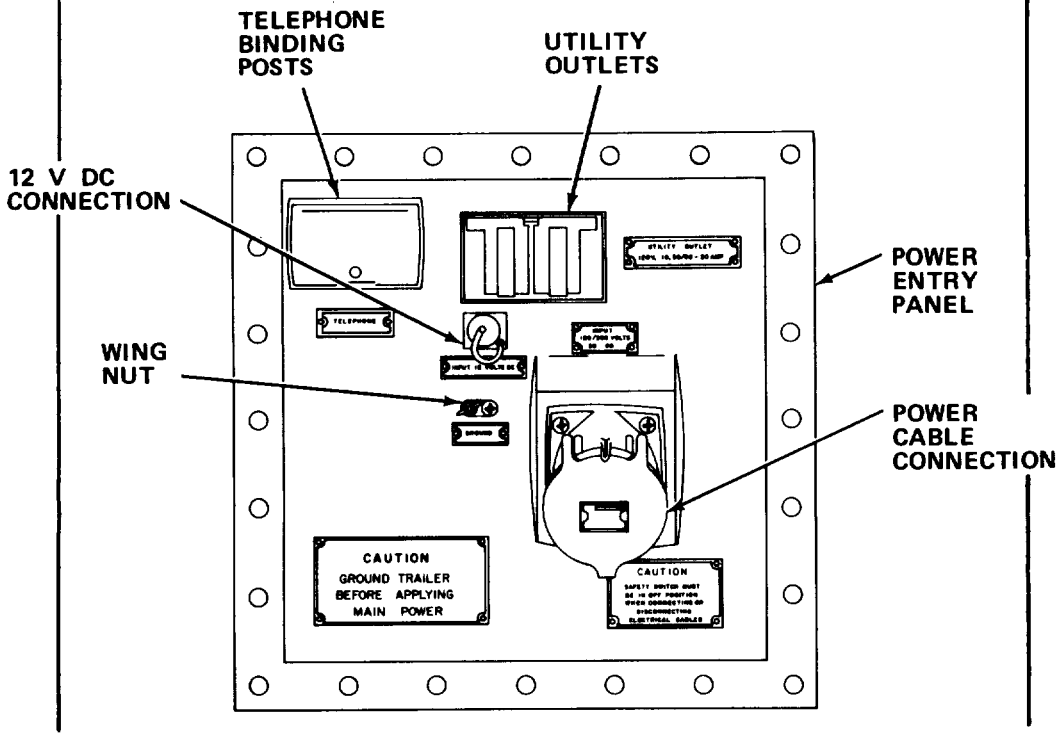


Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After | W - Weekly M - Monthly Q - Quarterly | AN - Annually S - Semiannually BI - Biennially | (Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		VAN BODY - Cont	
1		Inspect Exterior - Cont	
	B/W	4. Inspect power entry panel for accumulated dirt, water, or corrosion. Clean power entry panel.	
	B/W	5. Inspect power entry panel to be sure any unused receptacles are covered.	Missing covers.
	B/W	6. Inspect air conditioner/heater drain tube to be sure tube is positioned as shown. Check for breaks and crimps in hose and check connections for damage or leakage.	

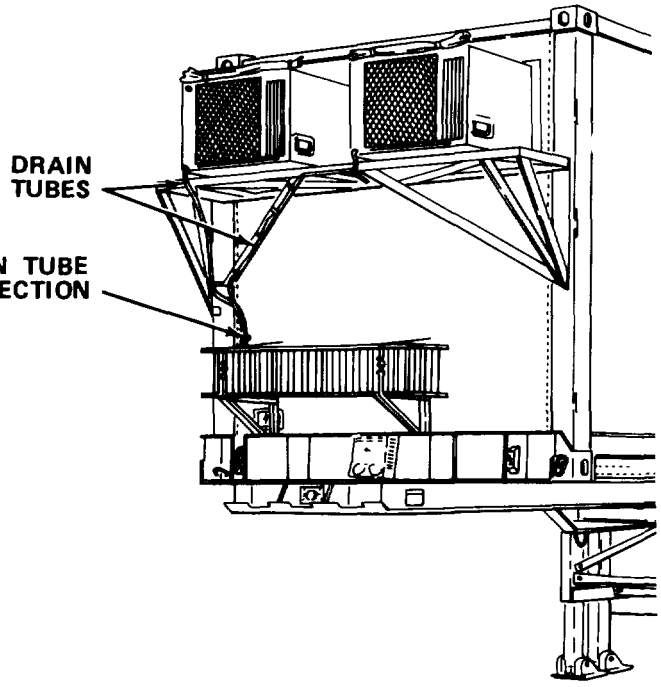


Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

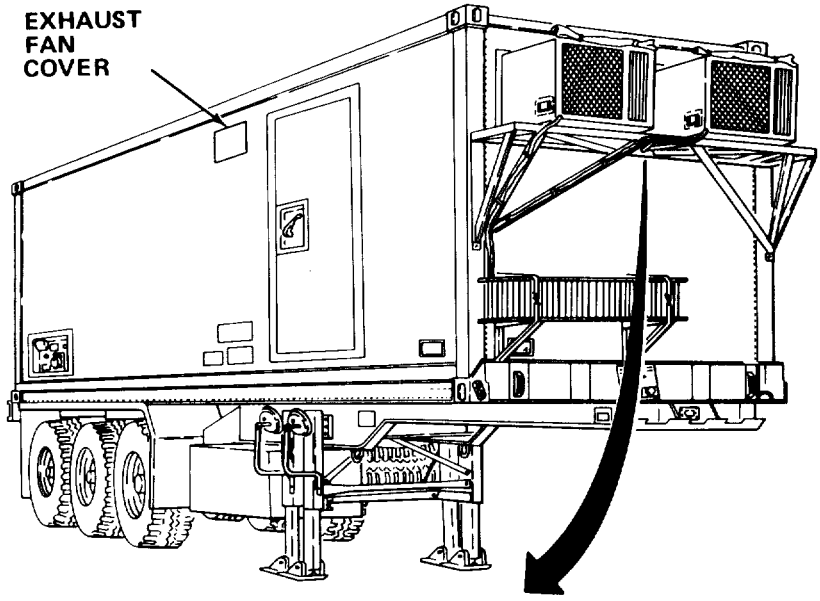
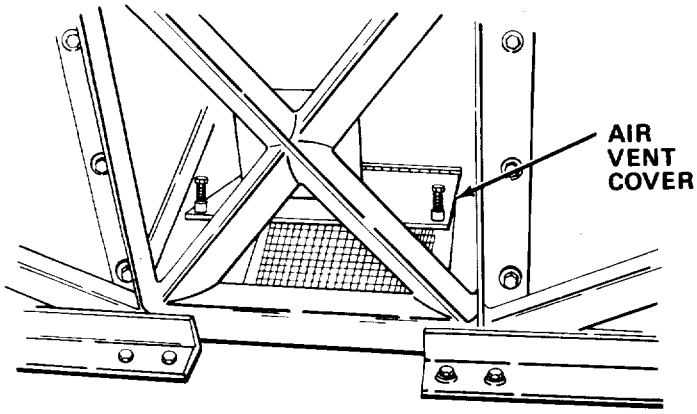
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		VAN BODY - Cont	
1		Inspect Exterior - Cont	
			
			
	B/W	7. Inspect exhaust fan cover and air vent cover to be sure they are not blocked or clogged. Clean as required. Clean screen with vacuum cleaner as necessary.	

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before, D - During, A - After | W - Weekly, M - Monthly, Q - Quarterly | AN - Annually, S - Semiannually, BI - Biennially | (Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		VAN BODY - Cont	
1		Inspect Exterior - Cont	
	B/W	8. Visually inspect ground connections to be sure ground cable is connected to terminal lug and ground rod. If necessary, clean:	Ground connections are broken or missing.
		WARNING Electrical shock hazard. Power cable must be deenergized before servicing entry panel connections. Death can result from failure to observe these safety precautions.	
		a. Turn power off to cable. Disconnect from power source.	
		b. Disconnect ground lug from ground rod.	
		c. Clean lug, cable end, and rod with wire brush.	
		d. Reconnect ground cable lug to rod.	
		e. Disconnect ground cable end from entry panel.	
		f. Clean terminal and cable end with wire brush.	
		g. Reconnect ground cable to entry panel.	
		h. Reconnect cable to power source. Turn power on.	
	B	9. Inspect boarding ladders for:	Steps are broken or ladder will not lock in place.
		a. Secure attachment of handrails.	
		b. Steps not broken.	
		c. Locking pins in place.	

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After | W - Weekly M - Monthly Q - Quarterly | AN - Annually S - Semiannually BI - Biennially | (Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		VAN BODY - Cont	
1		Inspect Exterior - Cont	
	B/D/A	10. Inspect front and rear van body locks to be sure locks are fully engaged.	Lock disengaged.
	Q	11. Inspect gaskets on personnel doors for leaks or damage.	
	W	11.1 Inspect hinges for proper placement of hinge pins.	Missing hinge pins.
	Q	12. Clean and paint blistered, pitted, or flaking areas and bare metal spots in accordance with instructions contained in TM 43-0139, Painting Instructions for Field Use.	
2		Inspect Interior.	
	B/D	1. Test emergency lights by pressing test button.	Emergency lights do not light.
	W	2. Inspect power cords and cables to be sure wires are not kinked, cut, or cracked.	Wires or cables are cracked or cut.
	W	3. Inspect plug connectors to be sure all plug connectors are tight and firmly seated. Tighten if necessary.	
	D	4. Inspect for burned out light bulbs and fluorescent lamps. Replace as required.	
	W	5. Inspect walls, ceiling, and floor for holes, open seams, or signs of seepage or leaks.	Leaks are present.
	D	6. Check storage cabinets for broken hinges, latches, and locks.	Hinge, latch, or lock is broken.

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After | W - Weekly M - Monthly Q - Quarterly | AN - Annually S - Semiannually BI - Biennially | (Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment is Not Ready/ Available If:
		VAN BODY - Cont	
2		Inspect Interior - Cont	
	B/M/A	7. Inspect fire extinguishers. Be sure security seals are not broken.	Fire extinguisher is missing or seals are broken.
	Q	8. Inspect circuit breaker panel.	Circuit breaker is defective.
		NOTE Inspection is to be conducted on a not-to-interfere basis with work being conducted. Individual equipment will be inspected as directed by the appropriate chapter of this manual.	

*U.S. GOVERNMENT PRINTING OFFICE: 1988 - 554-030/80177

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

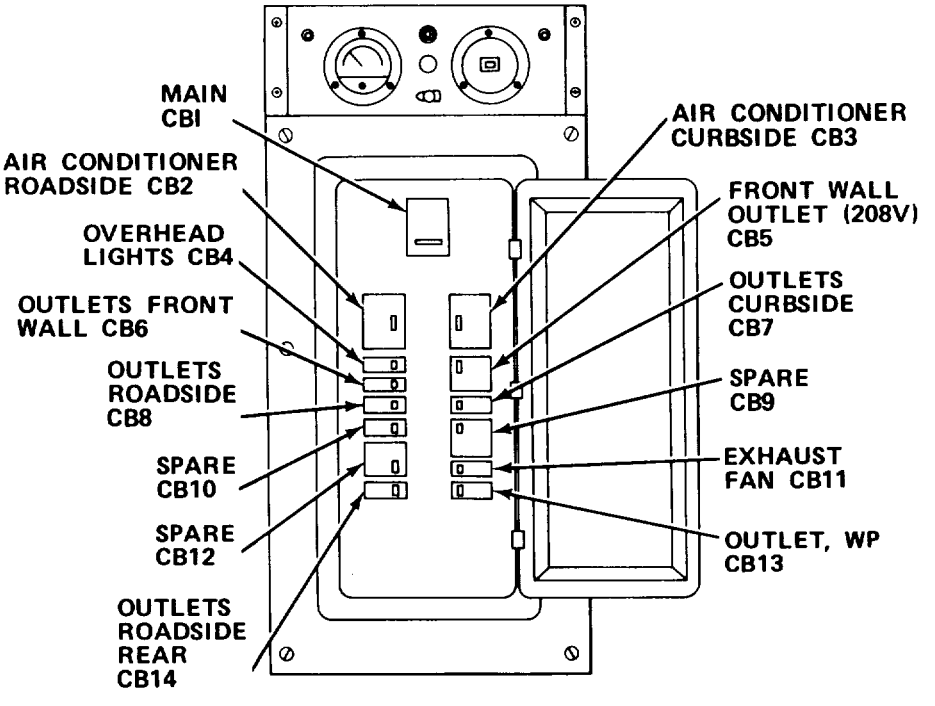
B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		VAN BODY - Cont	
2		Inspect Interior - Cont	



a. Set main circuit breaker to ON.

b. Set each circuit breaker to OFF, then ON.

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

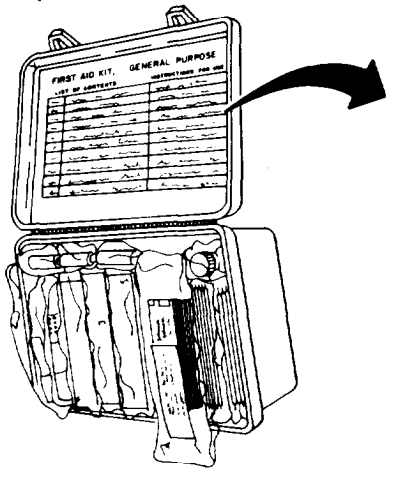
B - Before D - During A - After | W - Weekly M - Monthly Q - Quarterly | AN - Annually S - Semiannually BI - Biennially | (Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		VAN BODY - Cont	
2		Inspect Interior - Cont	
	Q	9. Inspect light traps.	
		a. Turn on fluorescent lamps (high level).	
		b. Close entrance doors. Have exhaust fan and air vent open. Inspect for light leakage through vents.	Light leaks are present.
		c. Place light switches ON; blackout override switches OFF.	
		d. Open door and make sure internal lights go off.	Blackout system is inoperable.
	A	10. Inspect/clean interior.	
		WARNING Death or serious injury may occur if wet or damp cloth is used to wipe or clean energized equipment, power cords, or cables.	
		CAUTION Do not sweep interior. Dislodged dirt or dust will ruin optical, electronic, and photographic equipment and supplies.	
		a. Wipe vertical and horizontal painted surfaces with cleaning cloth moistened with solution of general purpose detergent and fresh water until soil is removed from painted surfaces.	

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before W - Weekly AN - Annually (Number) - Hundreds of Hours
D - During M - Monthly S - Semiannually
A - After Q - Quarterly BI - Biennially

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		VAN BODY - Cont	
2		Inspect Interior - Cont	
		b. Dry vertical and horizontal painted surfaces with clean cloth.	
		c. Vacuum interior of section to remove dirt and waste. Pay particular attention to work stations.	
	S	11. Inspect first aid kit.	



FIRST AID KIT, GENERAL PURPOSE

LIST OF CONTENTS		INSTRUCTIONS FOR USE
3 ROLLS	ADHESIVE TAPE, SURGICAL, 1"X1½ YARDS	USE FOR MINOR CUTS AND CLOTHING REPAIR
18 EACH	BANDAGE, ADHESIVE, ¾"X3"	MINOR CUTS, AS REQUIRED
2 EACH	BANDAGE, GAUZE, COMPRESSED, CAMOUFLAGED, 3"X6 YARDS	CUT IN LENGTHS AS REQUIRED FOR BANDAGE INJURIES
1 EACH	BANDAGE, MUSLIN, COMPRESSED, CAMOUFLAGED, 37X37X52 INCH	USE FOR SLING
1 PKG	BLADE, SURGICAL PREPARATION RAZOR, STRAIGHT, SINGLE EDGE, 5s	SHAVING HAIR AND OPENING WOUNDS AS REQUIRED
1 PKG	COMPRESS AND BANDAGE, CAMOUFLAGED, 2"X2", 4s	FOR WOUNDS
3 EACH	DRESSING, FIRST AID, FIELD, 4X7 INCHES	FOR LARGE WOUNDS, EXCESSIVE BLEEDING
1 EACH	FIRST AID KIT, EYE DRESSING	FOR EYE WOUNDS, SEE INSTRUCTIONS
1 PKG	GAUZE, PETROLATUM, 2"X36", 3s	FOR BURNS, APPLY PAD OVER BURN
1 BTL	POVIDONE, IODINE SOLUTION, ½ OUNCE	AS DISINFECTANT AND CLEANSER OF CUTS AND WOUNDS, APPLY BEFORE BANDAGING
1 EACH	AMMONIA INHALANTS	CRUSH INHALANT BETWEEN FINGERS, HOLD A FEW INCHES FROM NOSE, HOLD CLOSER AS AMMONIA GETS WEAKER. WHEN TOO WEAK, USE FRESH INHALANT
1 EACH	INSTRUCTION BOOKLET AND FIRST AID EXPLANATIONS	

a. Remove first aid kit from bracket.

b. Remove contents.

c. Inspect container for damage.

d. Inspect contents for damage. Then use checklist to inventory contents.

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After | W - Weekly M - Monthly Q - Quarterly | AN - Annually S - Semiannually BI - Biennially | (Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		Inspect Interior - Cont	
2		e. Replace damaged or missing items.	
		f. Repack kit.	
		g. Reinstall kit.	
		12. Inspect blackout curtains.	
	B/W	a. Inspect blackout curtains and valances for tears, missing hooks, or broken eyelets.	
		b. Inspect nylon hook and pile tape on curtain and wall for security of attachment.	Curtains damaged.
		Inspect Air Conditioner/Heater. Refer to TM 5-4120-367-14 for preventive maintenance checks and services.	
3	B	Service Power Cable.	
4	M	WARNING Electrical shock hazard. Power cable must be deenergized before servicing. Death or serious injury may occur from failure to observe this safety precaution.	
		1. Turn off safety switch.	
		2. Disconnect cable from power entry panel.	
		3. Wrap any cuts or abrasions in cable with electrical insulation tape.	
		4. Reconnect power cable to entry panel.	

1-6. OPERATION UNDER USUAL CONDITIONS. Operation of the Information Section consists of activation of power after the section has been located at the operation site and 12 V dc power disconnected.

1-6.1 Preparation for Use.

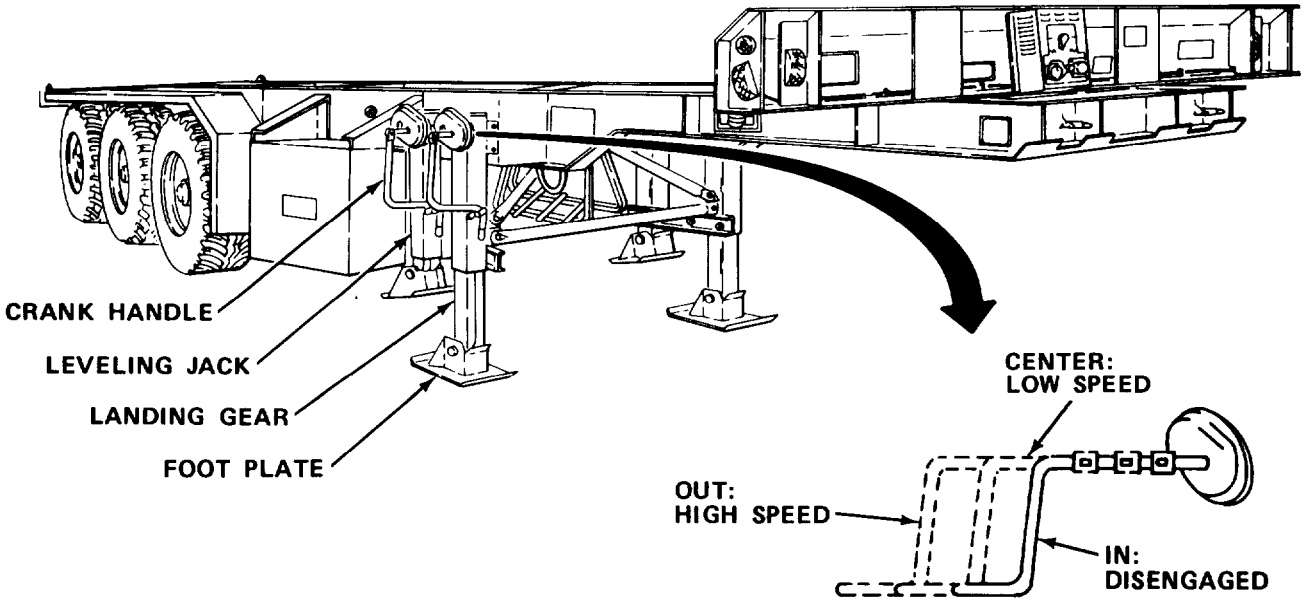
a. Procedures for leveling.

CAUTION

Trailer-mounted section must be on surface that is approximately level to avoid unnecessary stress or twisting of chassis when section is leveled.

NOTE

- Snow or ice should be removed from under leveling foot plate before attempting to level section.
- Sand, soft ground, or mud requires that shoring or scrap material be placed under leveling foot plate to increase surface area and prevent sinking into surface.
- Be sure that air suspension is deflated as indicated in TM 5-2330-305-14.



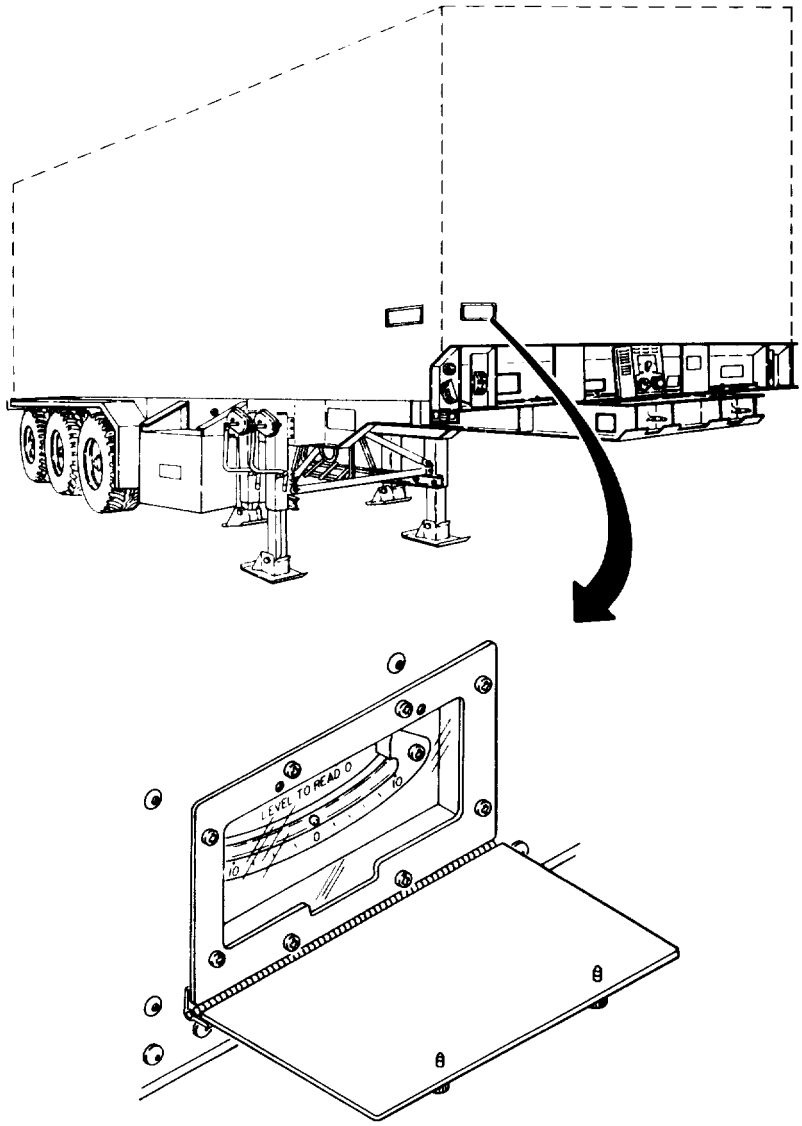
(1) Deflate air suspension in accordance with TM 5-2330-305-14.

(2) Approximately level trailer chassis by raising or lowering landing gear.

(3) Move handle from secured location and swing out.

(4) Pull crank handle on each leveling jack al 1 the way out and engage. There are two positions when handle is engaged. Fully out is high speed. Partially out is low speed.

(5) Lower each leveling jack by turning crank to right at high speed until foot plate just contacts ground.

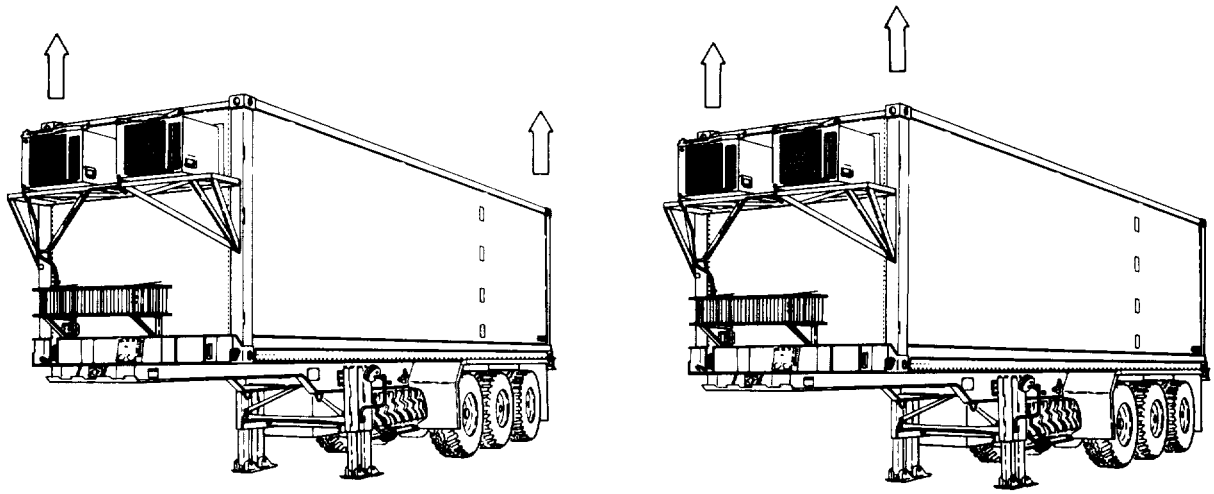


(6) Station personnel to have a clear view of level indicators at both front and rear of section.

(7) Observe level indicators to determine which end and side must be raised.

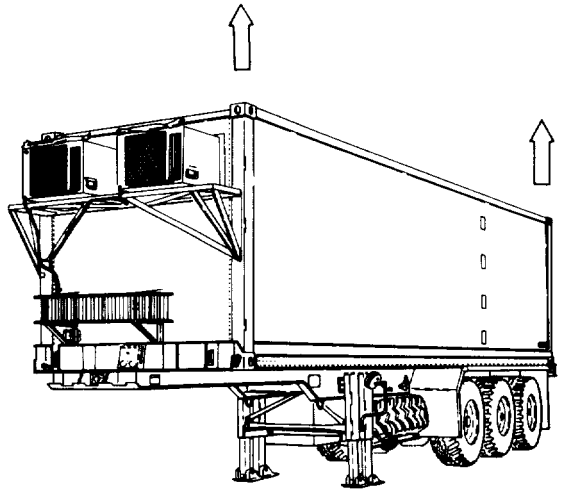
CAUTION

Do not attempt to level section by lifting at diagonal corners, or frame will be twisted.

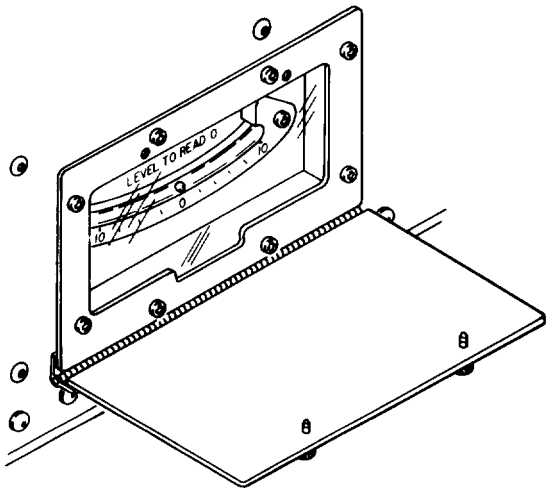


NO YES

(8) Raise low end by extending both leveling jacks at low end. Use low speed.



(9) Raise low side by extending both leveling jacks at low side.

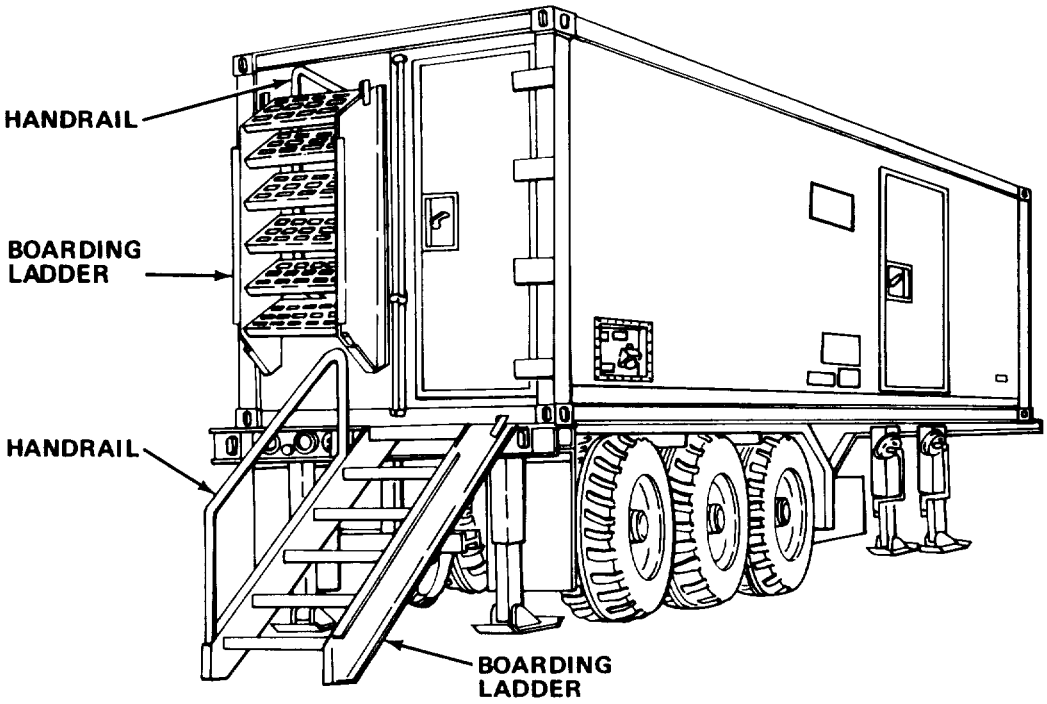


NOTE

Be sure ball is centered on all four level indicators ±2°.

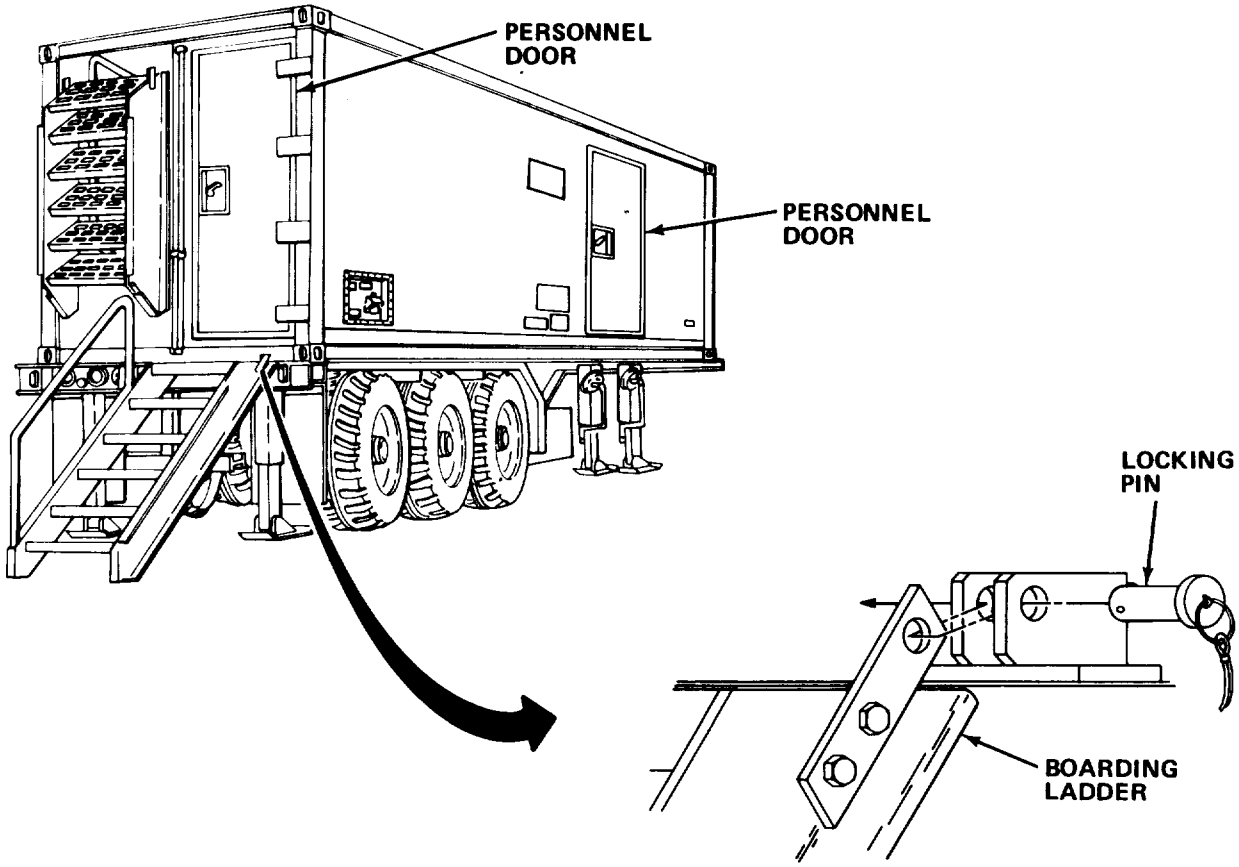
(10) Pull leveling crank handles away from trailer chassis, and lower crank handle to stowed position.

b. Procedures To Activate Section.

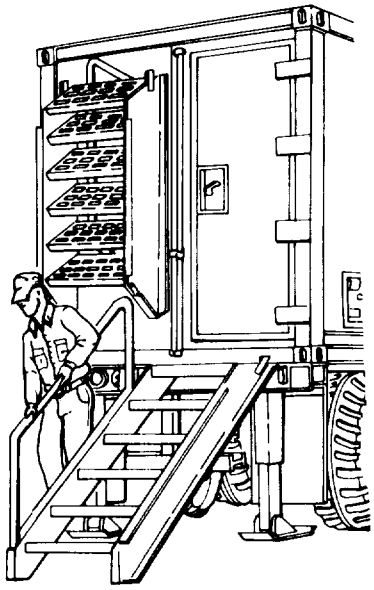


(1) Remove boarding ladders and handrails from rear of section.

(2) Remove handrails from ladders.



(3) Mount ladders at personnel doors and secure with locking pins.

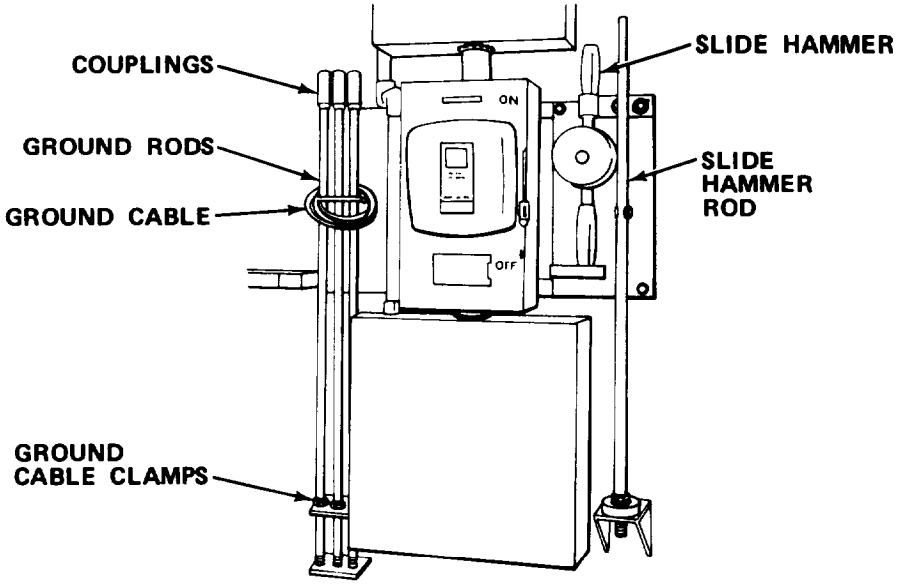


(4) Mount one handrail on each ladder.

(5) Enter section and be sure safety switch, main circuit breaker, and all equipment power supply switches are off.

WARNING

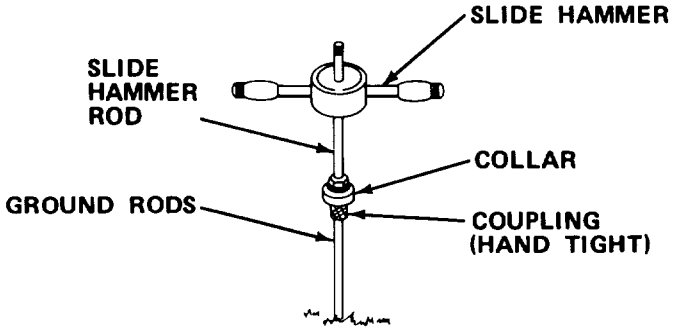
Death or serious injury may result from connecting power cable to section before grounding.



(6) Remove ground rod, slide hammer, and ground cable from section.

NOTE

- Apply a thin film of grease to threaded ends of rods before driving into ground. This will permit easy disassembly upon removal from ground.
- Bottom ground rod must be numbered or identified so that it will always be the first rod driven into the ground.
- These instructions supplement TC 11-6, Grounding Techniques.



(7) Select an area as close to power entry panel as possible to install ground rod. Then assemble the first ground rod and coupling to the slide hammer rod.

CAUTION

Do not allow ground rod to rotate when removing the slide hammer rod. Rods must be kept screwed together to make a good electrical ground.

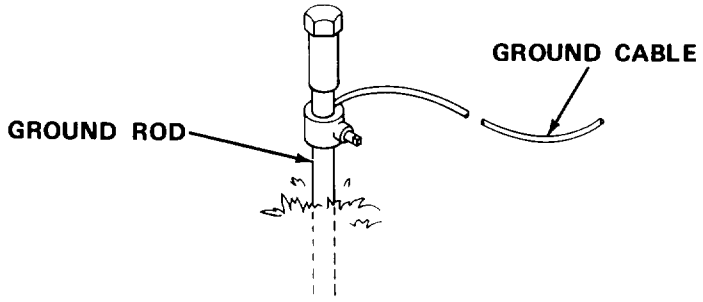
NOTE

Before driving ground rod be certain that rods meet inside coupling. Be sure collar is handtight against coupling.

(8) Place slide hammer on hammer rod end, and drive ground rod into ground. Remove slide hammer rod. Attach slide hammer rod to a new section of ground rod, and repeat procedure until only 12 in. (30.5 cm) of the third rod is above ground.

(9) Remove slide hammer and hammer rod, and place in section.

(10) Secure ground cable clamp and ground cable to ground rod.

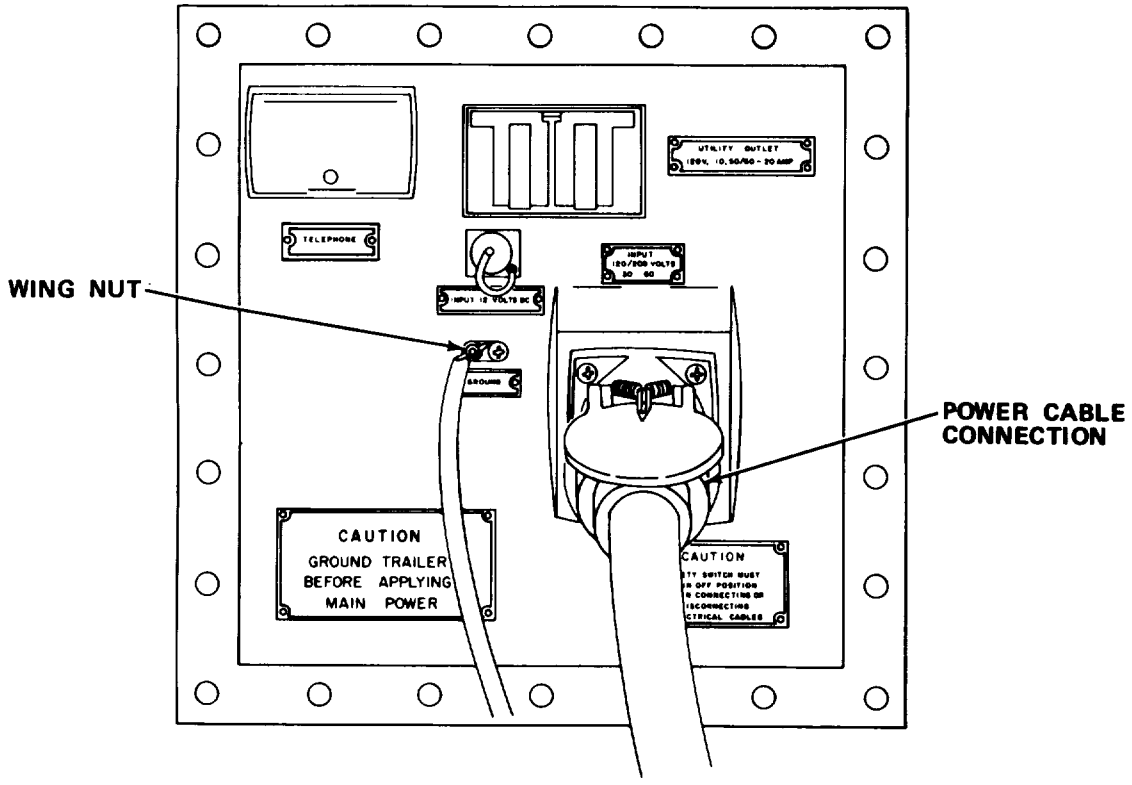


WARNING

To prevent death or serious injury, do not handle or clean power cable or connectors when cable is connected to power source.

NOTE

The section must be properly grounded before power is connected. If it is not possible to drive the three sections of ground rod fully into ground, the rods may each be driven into the ground separately and connected in series. If it is impossible to drive a ground rod, a suitable alternative ground must be found, such as a buried metal water pipe. See TC 11-6, Grounding Techniques for additional instructions.

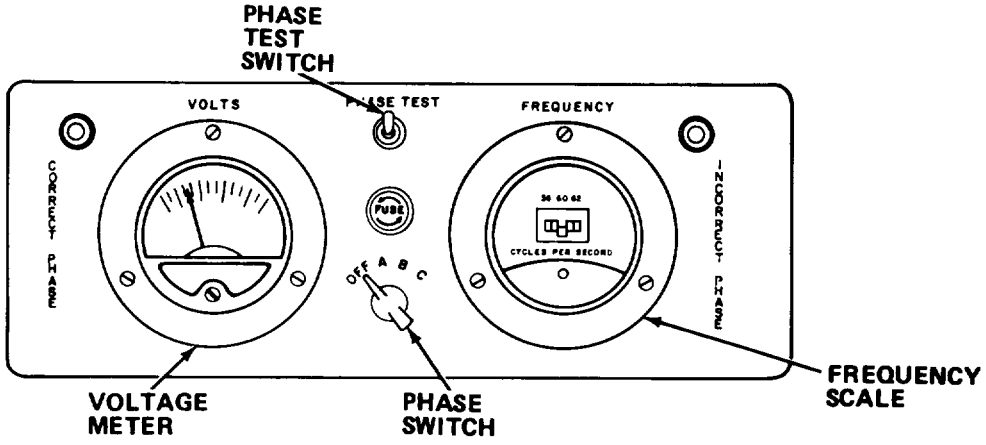


(11) Connect ground cable to ground lug with wing nut.

CAUTION

Be sure safety switch is off before connecting power cable to avoid equipment damage.

(12) Firmly connect the power cable to the power receptacle.



(13) Turn on safety switch.

CAUTION

Do not energize section if incorrect phase lamp lights. Damage to equipment may result.

(14) Check voltage and frequency as follows:

(a) Push phase test switch. Observe correct phase lamp lights.

(b) Turn phase switch to A.

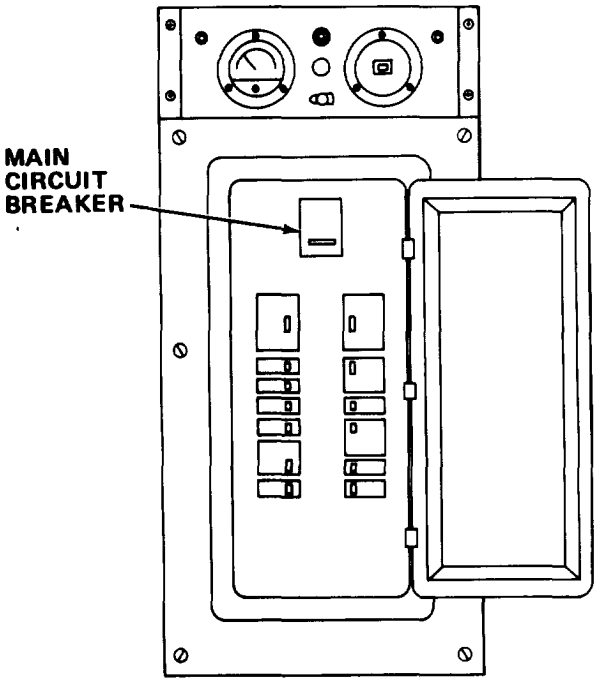
CAUTION

Voltage must be between 110 and 120, and frequency must be at 60 ±1 Hz on each leg before turning on main circuit breaker or damage to equipment may result.

(c) Read voltage on meter.

(d) Read frequency on scale.

(e) Repeat for positions B and C on phase switch.



(15) Set main circuit breaker ON.

NOTE

This step must be accompli shed if section is placed n operation in darkness, fog, mist, or under blackout conditions.

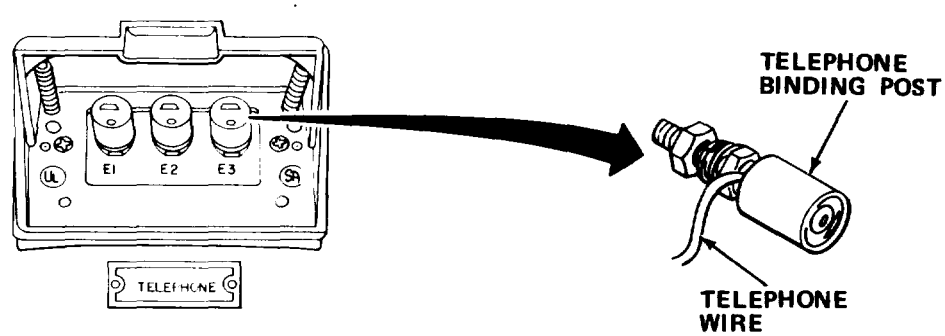
(16) Close blackout curtains, if required.

(17) Turn on circuit breakers in following order:

(a) Individual lighting.

(b) Curbside and roadside air conditioners/heaters.

(c) Curbside and roadside receptacles.



(18) Connect telephone lines to corresponding interior binding posts*

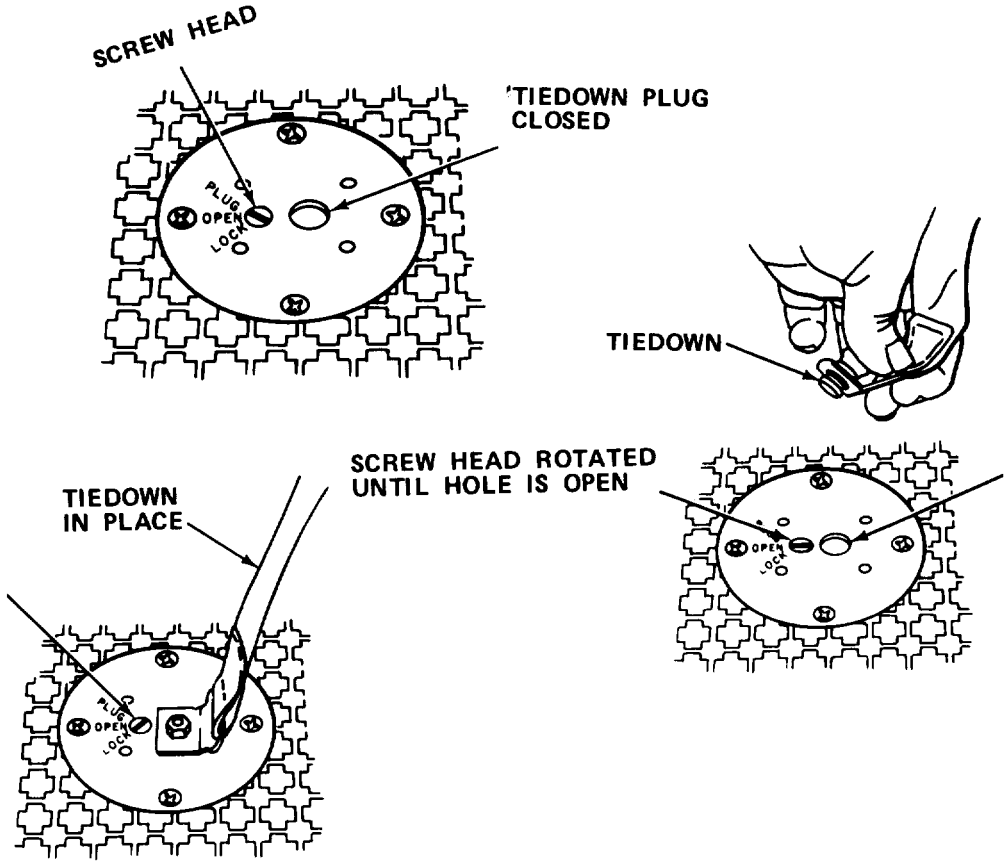
(19) Check blackout switches.

(20) Plug in emergency lighting and turn switch to READY.

(21) Fully deflate air shocks until Diazo copy machine and plain paper copier rest on top of air shocks.

1-6.2 Preparation for Movement.

a. Inventory equipment and supplies.



b. Install tiedowns in tiedown sockets.

c. Secure authorized equipment in proper containers or as specified by appropriate chapters.

d. Secure straps and remove slack from tiedowns.

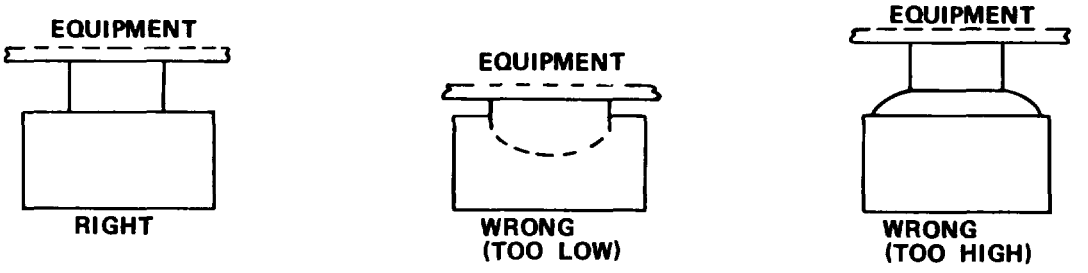
e. Inflate shock absorbers.

(1) Remove all valve caps.

CAUTION

To prevent damage to equipment or air shocks during transportation, inflate air shocks correctly. Do not exceed 70 psi (483 kPa) for the Diazo copy machine and plain paper copier.

(2) Connect air hose to valve.



(3) Inflate each mount until top of diaphragm is level as shown.

(4) Reinstall valve caps.

WARNING

Death or serious injury may occur if power cable is disconnected while power is on.

f. Turn equipment switches OFF.

g. Turn main circuit breaker OFF.

h. Turn safety switch OFF.

i. Have power cable disconnected at power supply end. Then disconnect power cable from receptacle. Put cable in storage box-on-trailer chassis.

j. Turn emergency light switch OFF.

k. Disconnect telephone cables from power entry panel.

CAUTION

To prevent loss of rod or thread damage, do not allow ground rod to rotate and unscrew when removing the slide hammer rod.

1. Remove ground rod with slide hammer, and put ground rods, couplings, and slide hammer inside section. Clean threads on each ground rod before storing.

NOTE

Be certain exhaust fan and air vent covers are securely closed.

m. Reinspect section interior for loose equipment and close all vents.

n. Close section. Secure and lock all personnel doors and cargo door.

NOTE

Be sure air conditioner/heater covers are down and secured.

o. Remove handrails from boarding ladders.

p. Remove boarding ladders and insert handrails into back of ladders.

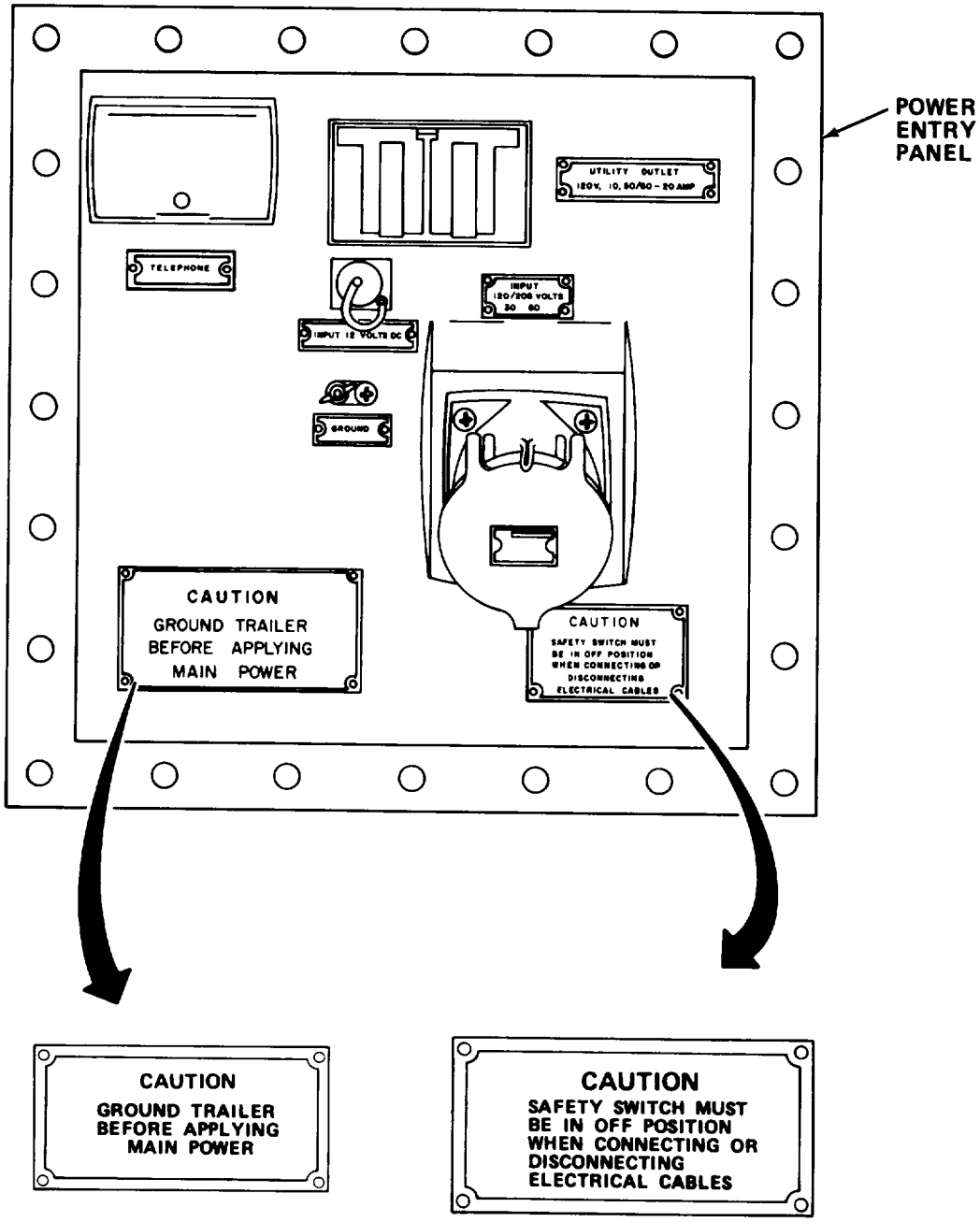
q. Secure ladders to back of section.

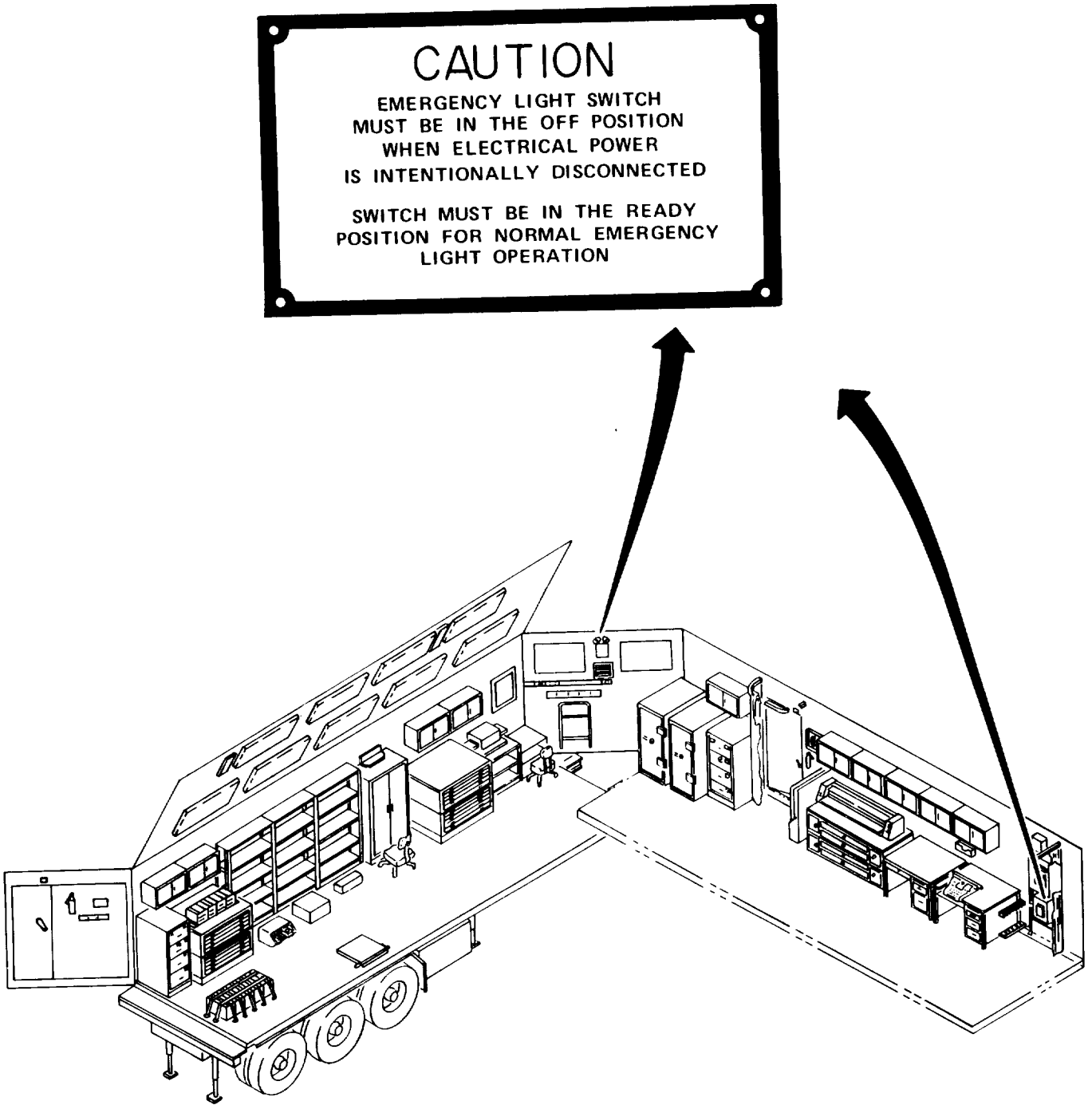
r. Fully extend landing gear.

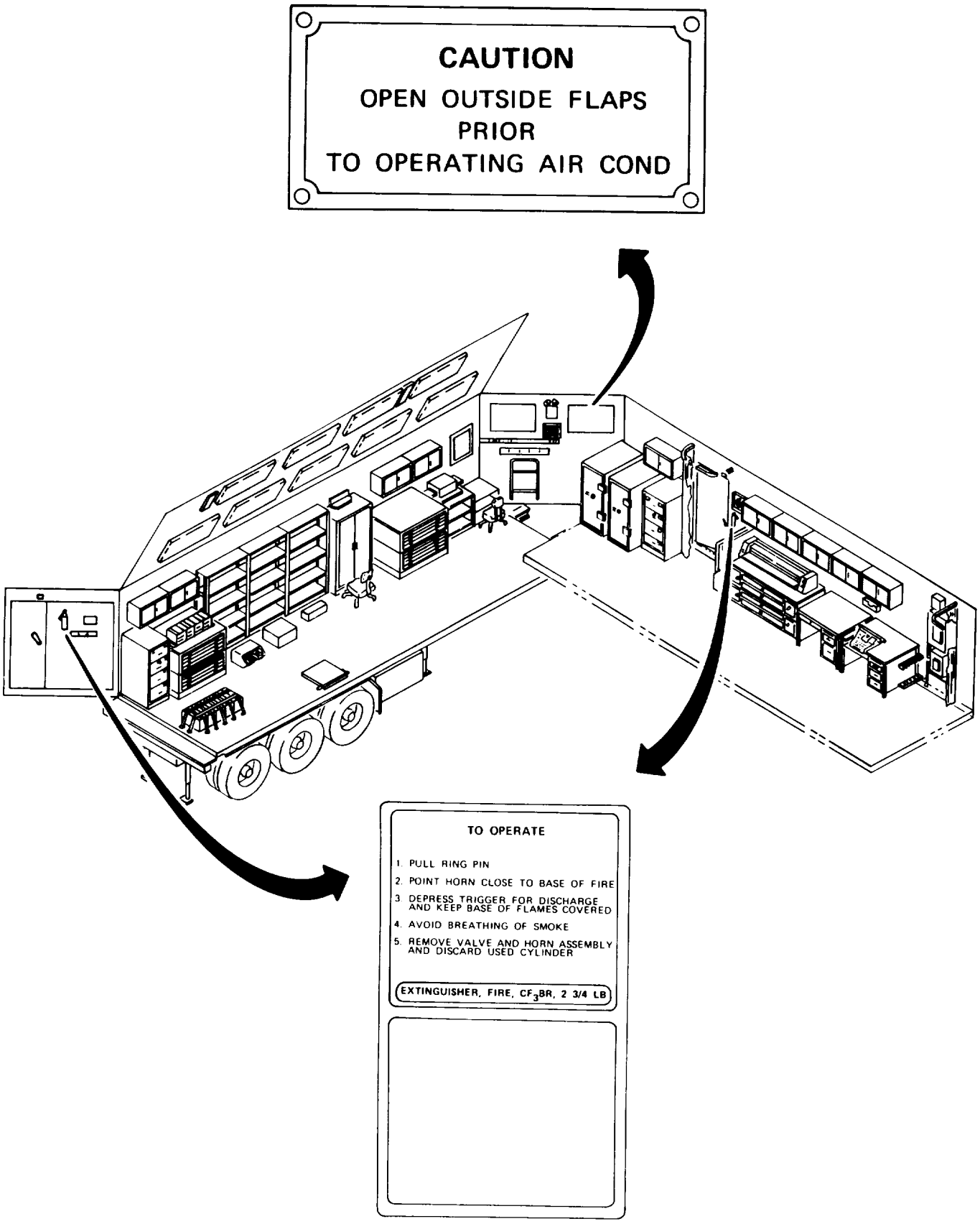
s. Retract leveling jacks.

t. Visually inspect van exterior to be sure all equipment and covers are secured.

1-6.3 Operating Instructions on Decals and Instruction Plates.



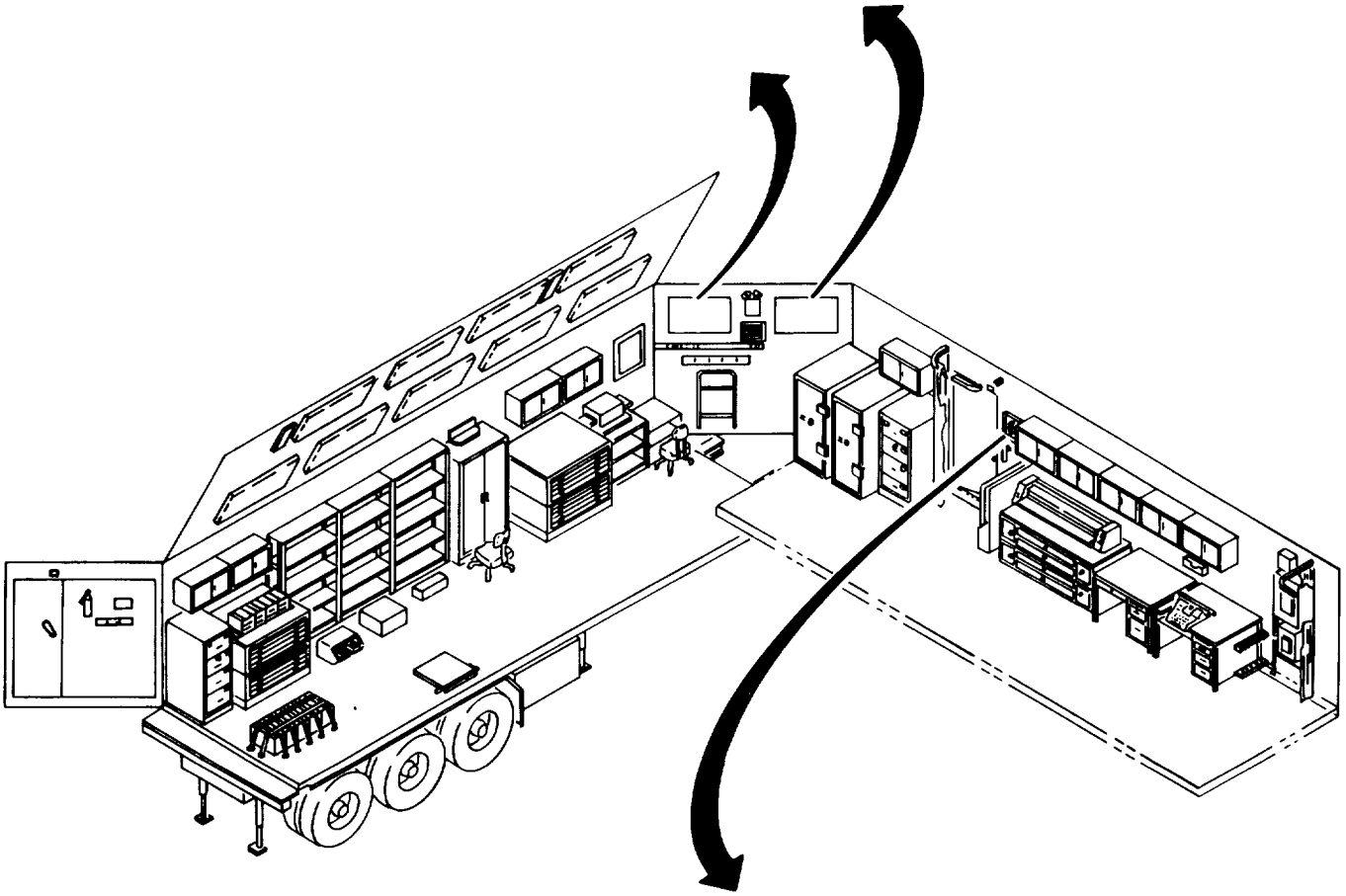

CAUTION
EMERGENCY LIGHT SWITCH
MUST BE IN THE OFF POSITION
WHEN ELECTRICAL POWER
IS INTENTIONALLY DISCONNECTED
SWITCH MUST BE IN THE READY
POSITION FOR NORMAL EMERGENCY
LIGHT OPERATION


CAUTION
OPEN OUTSIDE FLAPS
PRIOR
TO OPERATING AIR COND
TO OPERATE
1. PULL RING PIN
2. POINT HORN CLOSE TO BASE OF FIRE
3. DEPRESS TRIGGER FOR DISCHARGE AND KEEP BASE OF FLAMES COVERED
4. AVOID BREATHING OF SMOKE
5. REMOVE VALVE AND HORN ASSEMBLY AND DISCARD USED CYLINDER
EXTINGUISHER, FIRE, CF3BR, 2 3/4 LB

CAUTION

FOR SAFE OPERATION
SEE TM FOR PROPER
INTERNAL AND EXTERNAL
GROUNDING

CAUTION TO START UNIT ON "COOL"
MODE AT 0°F AMBIENT
JUMPER LACO SWITCH (S-5)



CAUTION

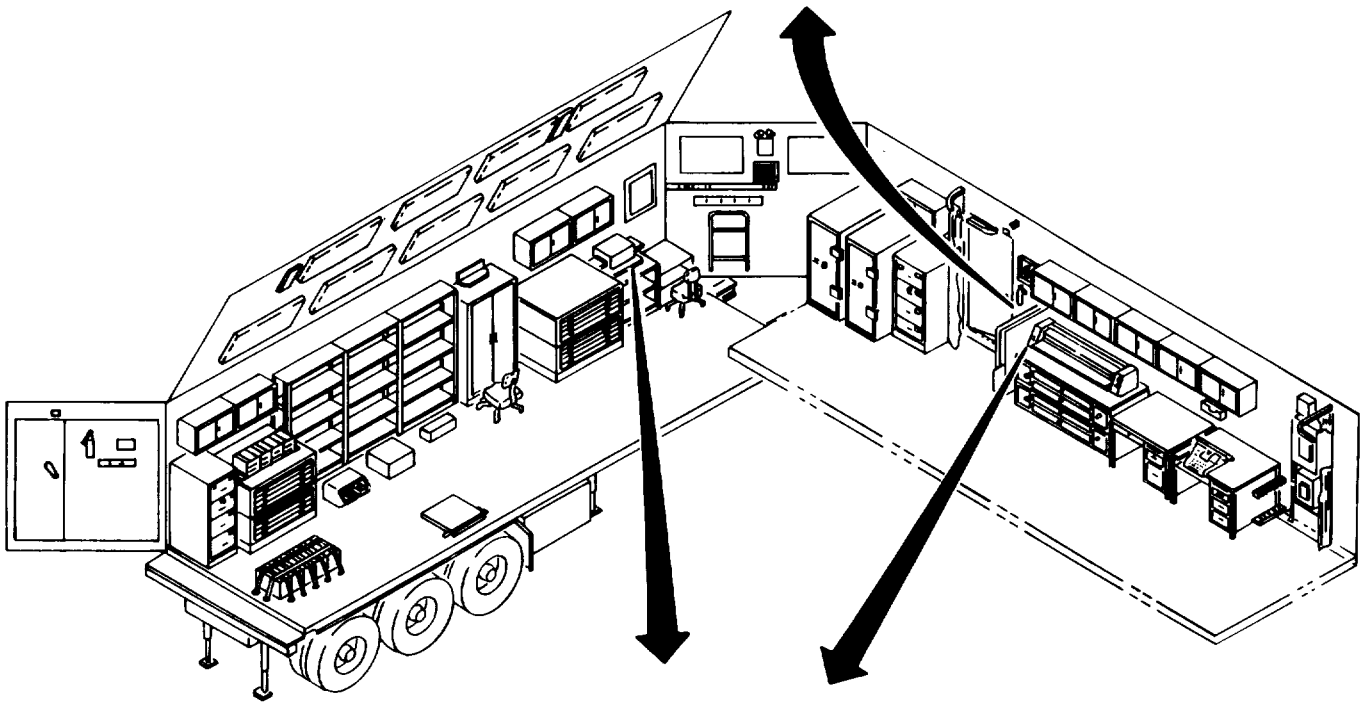
OPEN OUTSIDE VENT BEFORE

OPERATING FAN

INSTALL LIGHT TABLES

WITH INSERT

GLASS TO GLASS



LOAD MUST BE PLACED ATOP MOUNT BEFORE INFLATING.
MAXIMUM INFLATION PRESSURES MUST NOT BE EXCEEDED.
MOUNT MUST BE DEFLATED BEFORE REMOVAL OF LOAD.

BARRY STABL-LEVL SLM-3
LOAD RATING: 75 to 300 LBS.
MAX INFLATION 70 P.S.I.

EQUIPMENT LOAD ON MOUNT MUST BE WITHIN LOAD RATING.
EQUIPMENT MOUNTING SURFACE MUST BE, OR ADAPTED TO BE FLAT
AND OF SIZE TO COVER ENTIRE OUTSIDE DIAMETER OF MOUNT.

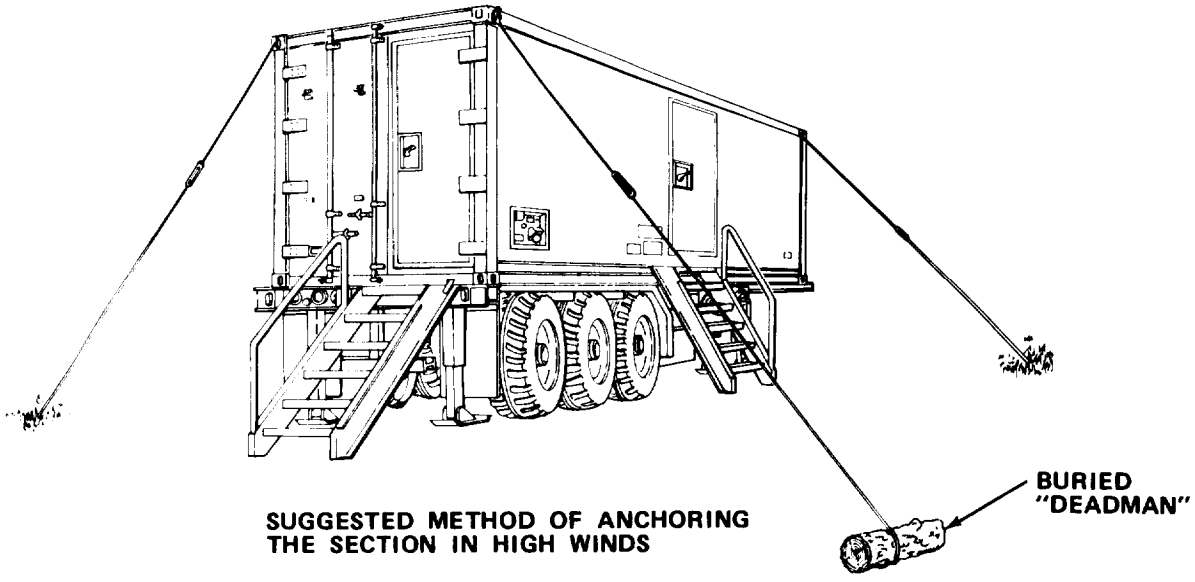
1-7. OPERATION UNDER UNUSUAL CONDITIONS .

NOTE

Damage to container permitting light leaks, water, or dirt entry must be temporarily repaired using available material on hand. Maintenance personnel will conduct permanent repairs; however, crew must maintain operational capability of section.

1-7.1 Operation in High Wind or Storm Conditions.

a. Relocate section if trees or structures present hazard.



SUGGESTED METHOD OF ANCHORING THE SECTION IN HIGH WINDS

b. Secure section corners at lifting eyes to deadmen or substantial objects.

c. Remove all loose objects from area.

1-7.2 Operation in Cold Weather.

a. The operation of the internal equipment is performed within environmentally controlled conditions; however, in extreme cold, the main power supply cable and ground cable, will become hard, brittle, and difficult to handle. Be careful when connecting or disconnecting the cables so that kinks and unnecessary loops will not result in permanent damage.

b. Make certain that connections and cable receptacles on the outside of the section are free of frost, snow, and ice.

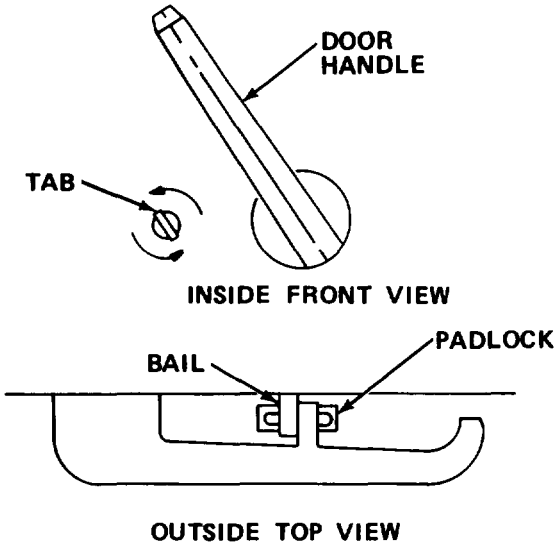
When section heaters are not operating or when the section is being transported, liquid consumable supplies may freeze, break their containers, then melt, and ruin equipment or documents. Store these items in an area to prevent equipment and document damage.

1-7.3 Operation in Extreme Heat The operation of the internal equipment is performed within environmentally controlled conditions; however, during transportation or when air conditioning units are not operating, consumable supplies may suffer reduced shelf life, and internal components may have accelerated deterioration of gaskets, seals, or insulation.

1-7.4 Operation in Tropical Conditions Fungi, mildew, or mold will form on and in equipment, documents, and supplies if internal environmental control equipment is not operating and outside heat and humidity are allowed to enter the section.

1-7.5 Operation in Desert Conditions. Dust, grit, and sand will ruin supplies, equipment, and documents. Extreme care must be taken to prevent dust, grit, and sand from entering the section. Air filters will be changed whenever airflow is restricted, and cleaning of section interior must be conducted more frequently than specified by PMCS schedules.

1-7.6 Emergency Procedures. There are no specific emergency procedures for operation of the section.



1-7.7 Emergency Means of Exit. In the event personnel are locked in the section, the tab may be turned to the left until the bail on the pad" ock falls free. The door handle is now free to turn.

Section III OPERATOR MAINTENANCE

1-8. LUBRICATION INSTRUCTIONS.

a. Lubrication instructions for the Information Section are contained in LO 5-6675-324-12, Lubrication Order, Information Section, Topographic Support System. The intervals and man-hours specified in the Lubrication Order are based on normal operations. During inactive periods, lubrication periods may be extended with adequate preservation.

b. Topographic equipment and all optical equipment require special care in lubrication. When a specified lubricant is called for, substitutions are not authorized. Minimum amounts of lubricant are to be used and all excess lubricant is to be immediately removed. Spray lubricants must not be used in the vicinity of optical equipment unless optics are completely protected. No lubricant is to be applied unless a thorough cleaning is conducted first to remove dirt, dust, or abrasive material.

c. Be sure that you refer to the appropriate chapter before any equipment is stored after use, that the temperature has stabilized, and that lubrication required after use is accomplished.

1-9. TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during operation or maintenance of the Information Section, or its components. You should perform the test/inspections and corrective actions in the order listed.

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

Table 1-2. TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
1. NO ELECTRICAL POWER TO SECTION.	

WARNING

Death or serious injury may result. Do not perform any e“ ectrical maintenance or make electrical connections or disconnections at main power receptacle when power cable is energized.

Step 1. Observe voltage and frequency for phases A, B, and C. Read 115 ±5V, 60±1 Hz.

(a) If voltage and frequency are correct, proceed to step 2.

(b) If voltage and frequency are incorrect, notify power supply supervisor.

CAUTION

Do not energize section if voltage or frequency is not correct. Damage to equipment may result.

Step 2. Press phase test switch on power panel for A, B, and C.

(a) If phases A, B, and C are correct, proceed to step 3.

(b) If incorrect phase lamp lights, notify power supply supervisor.

CAUTION

Do not energize section if incorrect phase lamp lights. Damage to equipment may result.

Step 3. Check safety switch position.

(a) If safety switch is ON, proceed to step 4.

(b) If safety switch is OFF, turn ON.

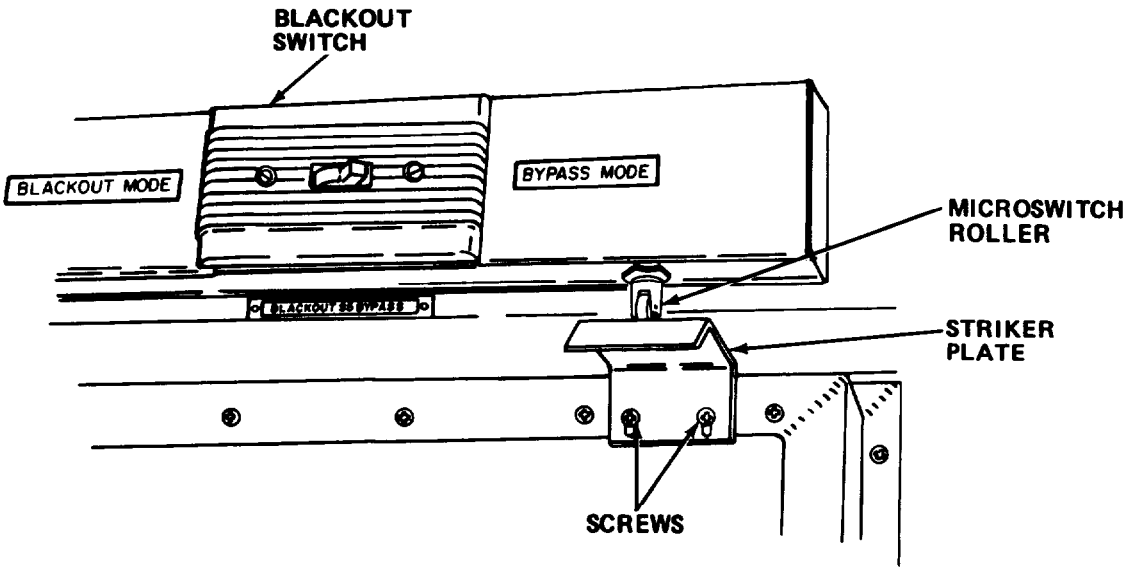
Table 1-2. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
1. NO ELECTRICAL POWER TO SECTION - Cont	
Step 4. Check main circuit breaker position.	
	(a) If circuit breaker is ON, refer to direct/general support maintenance.
	(b) If circuit breaker is OFF, turn ON.
	(c) If circuit breaker trips repeatedly, notify power supply supervisor.
2. NO ELECTRICAL POWER TO EQUIPMENT.	
Step 1. Check equipment power switch.	
	(a) If power switch is ON, proceed to step 2.
	(b) If power switch is OFF, turn ON.
Step 2. Check power cord.	
	(a) If power cord is plugged in, proceed to step 3.
	(b) If power cord is unplugged, plug in.
Step 3. Inspect circuit breaker panel for breakers in OFF position.	
	(a) If al 1 circuit breakers are ON, refer to direct/general support maintenance.
	(b) If any circuit breakers are OFF, turn ON.

Table 1-2. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE

3. BLACKOUT SWITCH DOES NOT OPERATE .



Step 1. Check blackout switch position.

(a) If switch is ON, proceed to step 2.

(b) If switch is OFF, reset switch to BLACKOUT.

Step 2. Check to see that striker plate contacts roller on microswitch.

(a) Loosen screws, and move plate up or down until microswitch operates.

(b) If blackout switch still fails to operate, refer to organizational maintenance.

1-10. MAINTENANCE PROCEDURES.

a. This section contains instructions covering operator maintenance functions for the Information Section. Personnel-required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

INDEX

1-10.1 Replace Fluorescent Lamp.

MOS: 81Q, Terrain Analyst

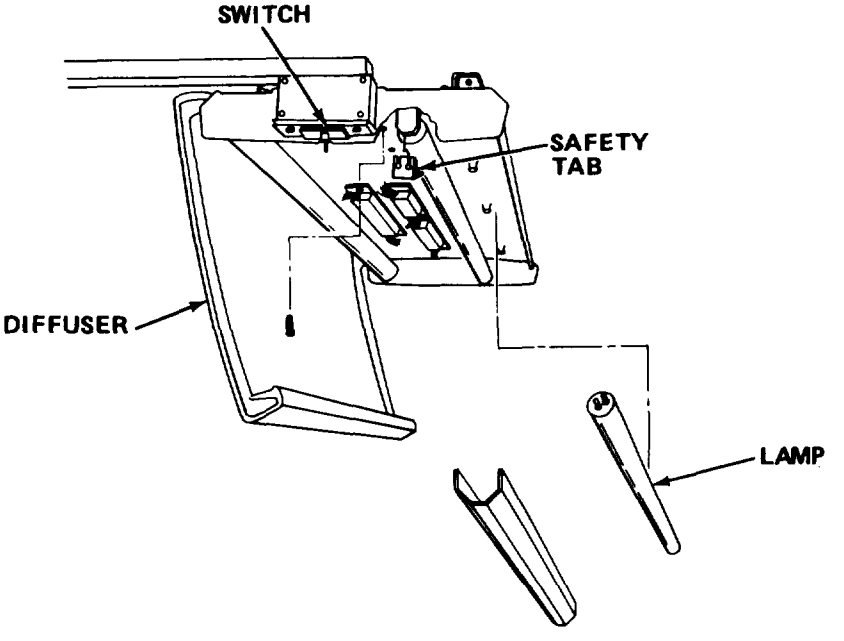
TOOLS: None

SUPPLIES: Fluorescent Lamp

WARNING

Death or serious injury may result if power is left on while servicing lamp.

a. Turn switch OFF.



b. Gently pull diffuser from light bracket, and place diffuser out of the way to prevent damage.

c. Remove safety tab from lamp socket.

d. Rotate defective lamp until prongs are free from slot and remove.

e. Insert new lamp prongs into slot and rotate 90 degrees.

f. Reinstall safety tab into lamp socket.

g. Reinstall diffuser.

h. Turn power ON.

1-10.2 Service Ventilation Ducts.

MOS : 81Q, Terrain Analyst

TOOLS: Vacuum Cleaner
Flat Tip Screwdriver

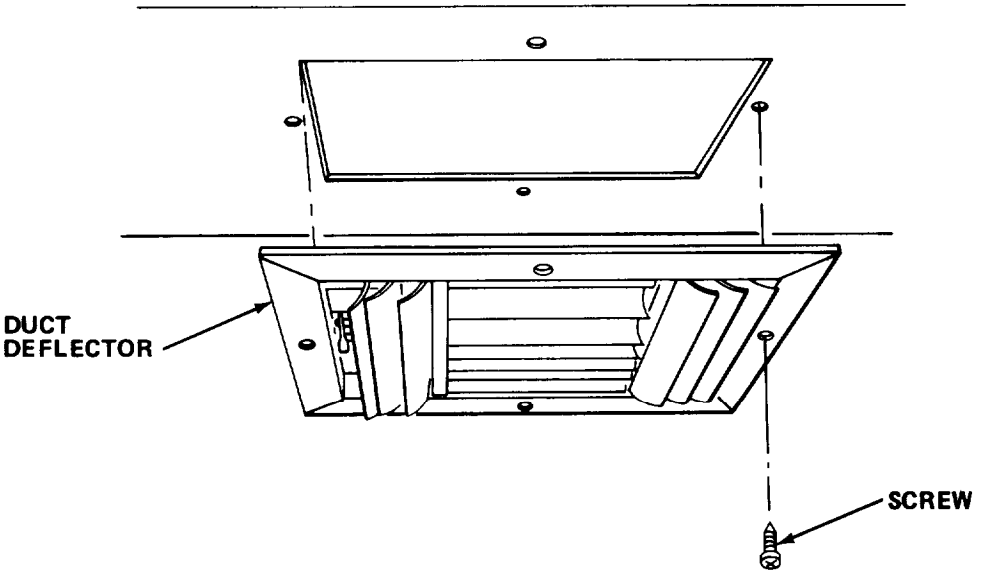
SUPPLIES: None

a. Cover equipment to prevent dust from entering equipment.

b. Close all doors and cabinets.

c. Remove any documents or other work that may be damaged by dirt/dust.

d. Turn off air conditioner/heater.



e. Remove four screws from each ventilation duct deflector.

f. Remove all duct deflectors.

g. Vacuum dirt or dust from deflector louvers.

h. Insert vacuum cleaner probe into ventilation duct at each deflector hole, and vacuum as far as probe will reach.

i. Reinstall deflectors and secure with four screws.

j. Turn on air conditioner/heater.

k. Vacuum any dislodged dirt or dust from interior of section.

l. Remove covers for operation.

1-10.3 Replace, Blackout/Dome Light.

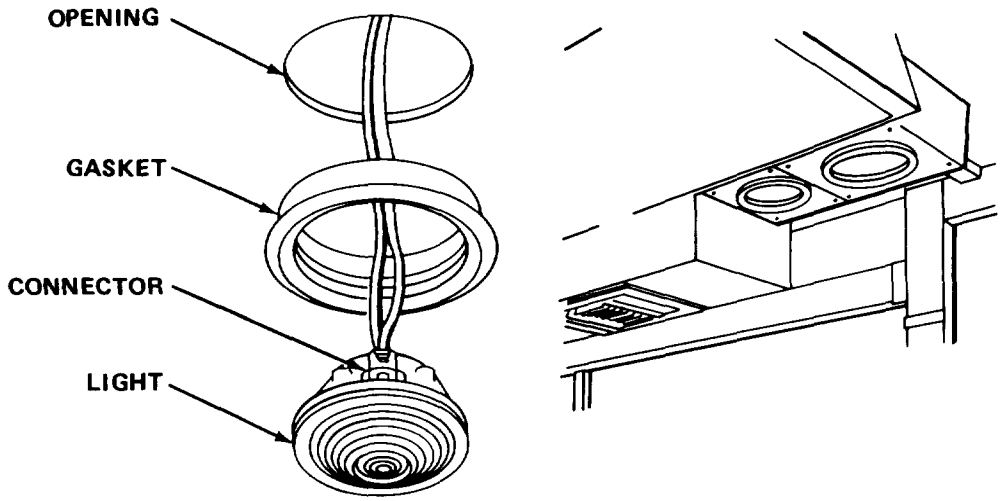
MOS: 81Q, Terrain Analyst

TOOLS: None

SUPPLIES: Light (12 V)
Silicone Spray (Item 27, Appendix E)

NOTE

Blackout light and dome light are sealed units. No bulb replacement is possible. Complete light must be replaced.



a. Push light and gasket up into opening.

b. Tilt and remove light and gasket from opening.

c. Disconnect defective light from connector.

d. Connect new light to connector.

e. Reinstall gasket in opening.

NOTE

The use of silicone spray on the gasket will help to position light.

f. Position light in gasket and push in.

Section IV ORGANIZATIONAL MAINTENANCE

1-11. **LUBRICATION INSTRUCTIONS.** This equipment does not require lubrication at this level of maintenance.

1-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE) ; AND SUPPORT EQUIPMENT.

1-12.1 Common Tools and Equipment For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

1-12.2 Special Tools; Test, Measurement, and Diagnostic Equipment; and Support Equipment. Special Tools, TMDE, and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.

1-12.3 Repair Parts. Repair parts for this equipment are listed in the Repair Parts and Special Tools List, TM 5-6675-324-24P covering organizational maintenance for this equipment.

1-13. SERVICE UPON RECEIPT.

NOTE

The section may be received mounted on a chassis, or as a van body for mounting on an available transporter, or on site. Inspection of the chassis is covered in TM 5-2330-305-14. Inspection of the air conditioner/heater is covered in TM 5-4120-367-14.

1-13.1 Checking Unpacked Equipment

Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6, Packing Improvement Report.

(1) Visually inspect the section exterior starting at the rear to cover rear, curbside, roadside, front, top, and bottom. Inspect for damage, tears, breaks or corrosion.

(2) Enter section and inspect for broken equipment, tool boxes, chairs, or equipment loose and not secured.

(3) Close doors and vents to determine if light leaks exist.

(4) Inspect doors for damage, torn or rotted seals, and tightness of closure.

(5) Inspect interior for evidence of water damage, fungi, mildew or corrosion.

(6) Report damage or discrepancies in accordance with AR 735-11 and AR 735-11-2.

b. Check the equipment against the packing list to see if shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

(1) Inventory section against Components of End Item and Basic Issue Items Lists (Appendix C).

(2) Inventory expendable supplies contained in section as shown in Appendix E.

(3) Conduct operational checks on equipment in accordance with the chapters in this manual when operators are available and power can be safely provided to the van body.

c. Check to see whether the equipment has been modified.

1-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

a. PMCS are designed to keep the equipment in good working condition by performing certain tests, inspections, and services. The intervals provide you, the organizational technician, with time schedules that determine when to perform specified tasks.

b. Item number column. Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your "TM Number" column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording the results of PMCS.

Interval columns. This column determines the time period designated to perform your PMCS.

d. Item to be inspected and procedures column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation Chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.

e. Preventive maintenance checks and services for the air conditioners/heaters are contained in TM 5-4120-367-14.

f. List of tools and materials required for PMCS is as follows:

Item	Quantity
Vacuum Cleaner	1 ea
8 in. Adjustable Wrench	1 ea
Cross Tip Screwdriver	1 ea
Flat Tip Screwdriver	1 ea
Spring Scale	1 ea
Padlock	1 ea
Flashlight	1 ea

Table **1-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES**

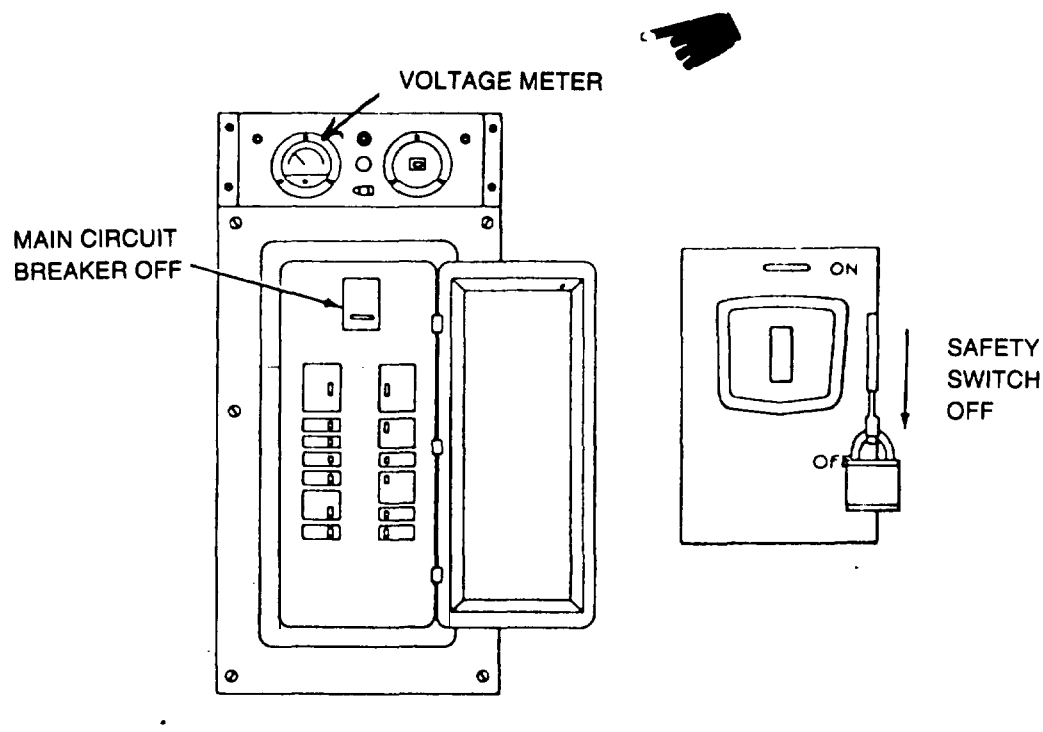
B - Before
D - During
A - After

W - Weekly
M - Monthly
Q . Quarterly

AN- Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	NTERVAL	ITEM TO BE INSPECTED PROCEDURE
		VAN BODY
1	M	Service Air Conditioner/Heater. Refer to TM **5-4120-367-14** for preventive maintenance checks and services.
2	M	Service Lighting System.



WARNING

Do not open circuit breaker panel or service electrical connections, cables or switches until main power is off, and voltage meter confirms circuit is not energized. Death may result from failure to observe these safety precautions.

1. Turn off main circuit breaker. Turn off safety switch.

2. Padlock safety switch.

Table 1-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

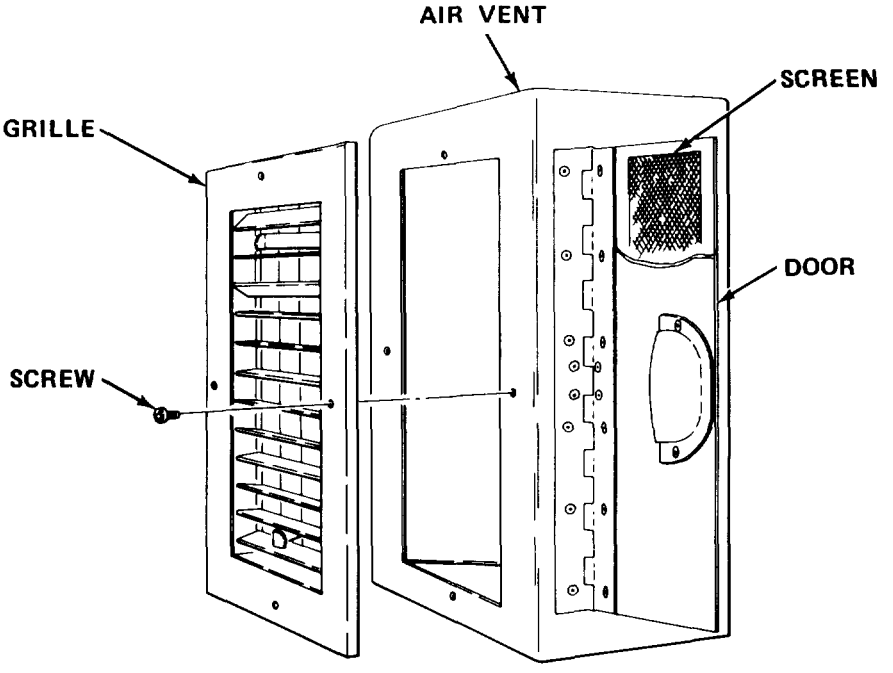
B - Before D - During A - After | W - Weekly M - Monthly Q - Quarterly | AN - Annually S - Semiannually Bl . Biennially | (Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		VAN BODY - Cont
2	M	Service Lighting System - Ceo 3. Tighten al 1 loose screws, bolts, and clamps. 4. Check which switches, switch plate outlets, receptacles, and posts require repair. 5. Check for loose screws and nuts on ceiling, console lights, circuit breaker panels, and conduits. 6. Remove padlock. 7. Turn on main circuit breaker and safety switch.

Table 1-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - **Cont**

B - Before	W - Weekly	AN - Annually	(Numbed - Hundreds of Hours
D . During	M - Monthly	S - Semiannually	
A - After	Q - Quarterly	Bl - Biennially	

ITEM NO,	IN-TER-VAL	ITEM TO BE INSPECTED	PROCEDURE
		VAN BODY - Cont	
3	M	Service Air Vent	

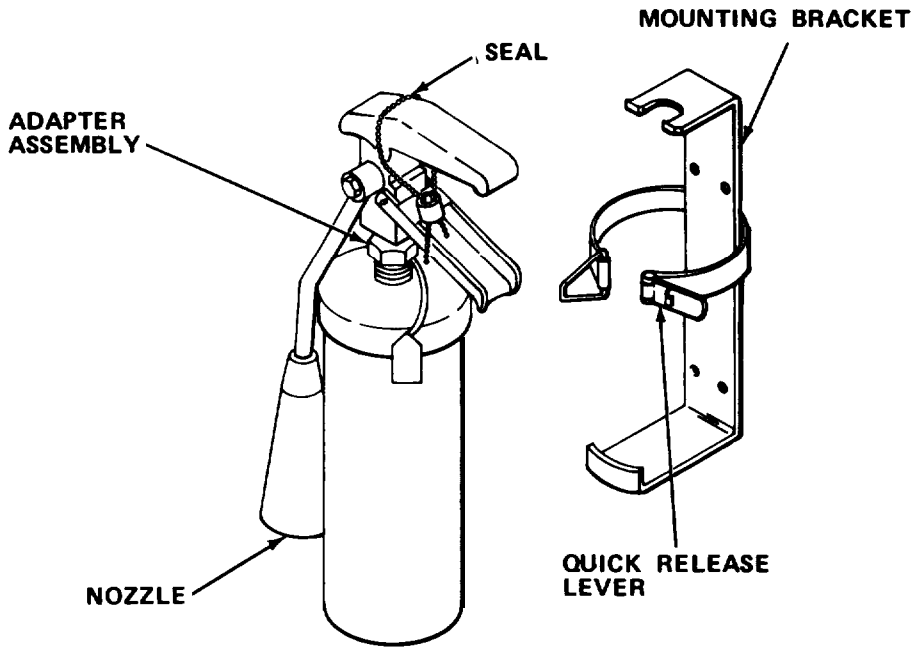


1. Remove screws from front of grille.
2. Remove front grille.
3. Using vacuum cleaner, clean screens on side doors. Vacuum inside of air vent.
4. Reinstall grille and secure with screws.

Table 1-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	s - Semiannually	
A - After	Q - Quarterly	Bl - Biennially	

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		VAN BODY - Cont
4	M	Inspect Fire Extinguisher.



1. Remove from mount ing bracket. Check free movement of bracket.
2. Inspect nozzle and adapter assembly for damage.
3. Inspect seal. Be sure it is not broken.

S

4. Weigh cylinder. Replace if gross weight has decreased by 6 oz (170 g) or more.

1-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES.

a. Organizational troubleshooting procedures cover the most common malfunctions that may be repaired at the organizational level. Repair or adjustment requiring specialized equipment is not authorized unless such equipment is available. Troubleshooting procedures used by the operator should be conducted in addition to the organizational troubleshooting procedures.

b. This manual cannot list all the possible malfunctions or every possible test/ inspection and corrective action. If a malfunction is not listed or corrected by a listed corrective action, notify your supervisor.

For unidentified malfunctions, use the facing schematic or the foldout located at the end of this manual for further fault analysis.

d. If any component of the Information Section does not power up when turned on, verify that 120 V ac is present at the receptacle. If voltage is not present, plug equipment into receptacle with power available and proceed with equipment trouble-shooting. Perform no-power troubleshooting procedures for dead receptacle (Table 1-4).

Table 1-4. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

WARNING

Electrical shock hazard. Be sure power is off when checking continuity at troubleshooting points. Death or serious injury could result from failure to do so.

1. FLUORESCENT CEILING LAMP IS INOPERATIVE.

Step 1. Check for continuity of fluorescent lamp switch.

(a) If continuity exists, proceed to step 2.

(b) If continuity does not exist, replace switch (paragraph 1-16.3).

Step 2. Check for continuity of lamp ballast.

(a) If continuity exists, proceed to step 3.

(b) If continuity does not exist, replace lamp bal last (paragraph 1-16.1).

Table 1-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
1. FLUORESCENT CEILING LAMP IS INOPERATIVE - Cont	
Step 3. Check for shorts in RF Filter.	Replace RF filter (paragraph 1-16.2).
2. EXHAUST FAN IS INOPERATIVE.	
Check on/off switch for continuity.	(a) If continuity exists, replace fan (paragraph 1-16.9). (b) If continuity does not exist, replace switch (paragraph 1-16.4).
3. EMERGENCY LIGHTS ARE INOPERATIVE.	
Press in test indicator.	If lamps do not light, replace emergency light assembly (paragraph 1-16.11).
4. NO POWER TO EQUIPMENT.	
Step 1. Check circuit breaker ON/OFF position.	(a) If circuit breaker is ON, proceed to step 2. (b) If circuit breaker is OFF, turn ON. (c) If circuit breaker trips repeatedly, notify power supply supervisor.
Step 2. Check circuit breaker input for 120 V ac.	(a) If input voltage is present, proceed to step 3. (b) If input voltage is not present, refer to direct/general support maintenance for repair or replacement of defective wiring.

Table 1-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
4. NO POWER TO EQUIPMENT - Cont	
Step 3. Check circuit breaker output for 120 V ac.	
(a) If output voltage is present, proceed to step 4.	
(b) If output voltage is not present, refer to direct/general support maintenance for circuit breaker replacement (paragraph 1-20.5).	
Step 4. Remove receptacle and check for 120 V ac input.	
(a) If present, replace receptacle (paragraph 1-16.6).	
(b) If not present, refer to direct/general support maintenance for repair or replacement of defective wiring.	

1-16. MAINTENANCE PROCEDURES.

This section contains instructions covering organizational maintenance functions for the Information Section. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

INDEX

INDEX - Cont

1-16.1 Replace Fluorescent Lamp Ballast.

MOS: **35E,** Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
1/4 in. Wrench
1/4in. Drive Socket Set
Scribe

SUPPLIES: Lamp Ballast
Wire Ties

WARNING

Death or serious injury may occur unless overhead light circuit breaker and main circuit breaker are turned off before working on light fixture.

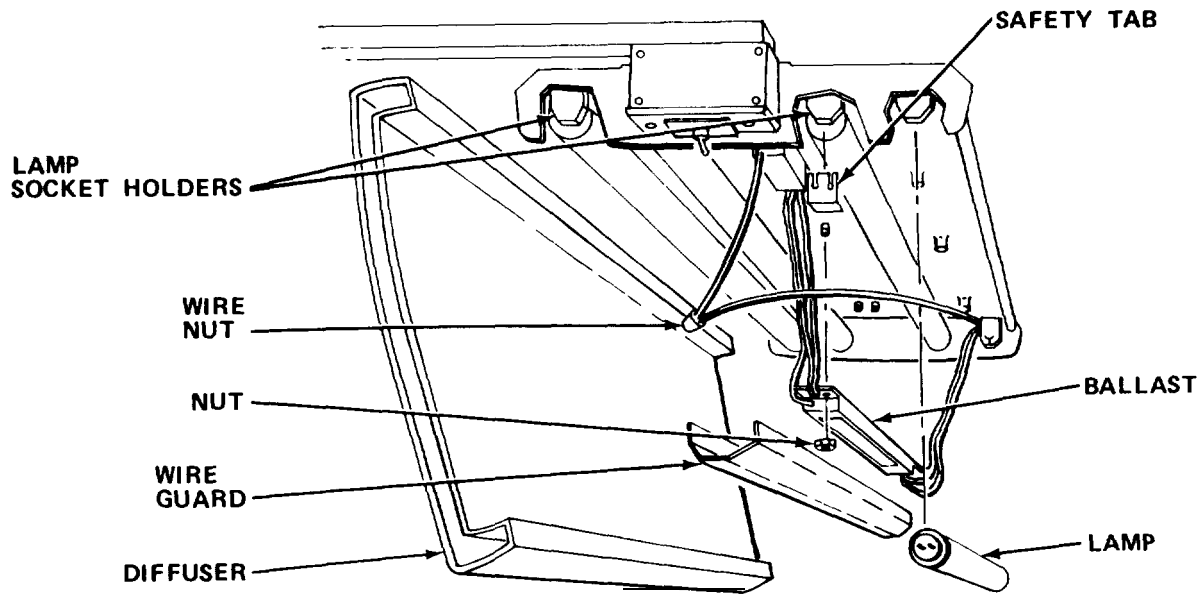
a. Turn off overhead light circuit breaker and main circuit breaker.

b. Remove diffuser from light fixture.

c. Remove safety tabs and lamps. Place in diffuser.

d. Squeeze light wire guard and remove.

e. Remove wire ties as required.



f. Tag wires from ballast for reference.

g. Disconnect ballast wire from wire nut connection.

h. Pry out lamp socket holder with flat tip screwdriver.

i. Using scribe, depress wire clips and disconnect ballast wiring.

j. Remove nut and defective ballast.

k. Install new ballast and connect wires to corresponding lamp socket holders.

1. Secure with nut.

m. Reconnect ballast wire to wire nut connection.

n. Remove tags.

o. Install new wire ties.

NOTE

Be sure wires are free of kinks and do not interfere with placement of wire guard.

p. Reinstall wire guard.

q. Reinstall lamp and safety tabs.

r. Reinstall diffuser.

s. Turn on overhead light circuit breaker and main circuit breaker.

1-16.2 Replace Radio Frequency (RF) Filter.

MOS: 35E, Special Electrode Devices Repairer

TOOLS: Flat Tip Screwdriver
1/4 in. Wrench
1/4 in. Drive Socket Set

SUPPLIES: RF Filter
Wire Tires

WARNING

Death or serious injury may occur unless overhead light switch is turned OFF before working on light fixture.

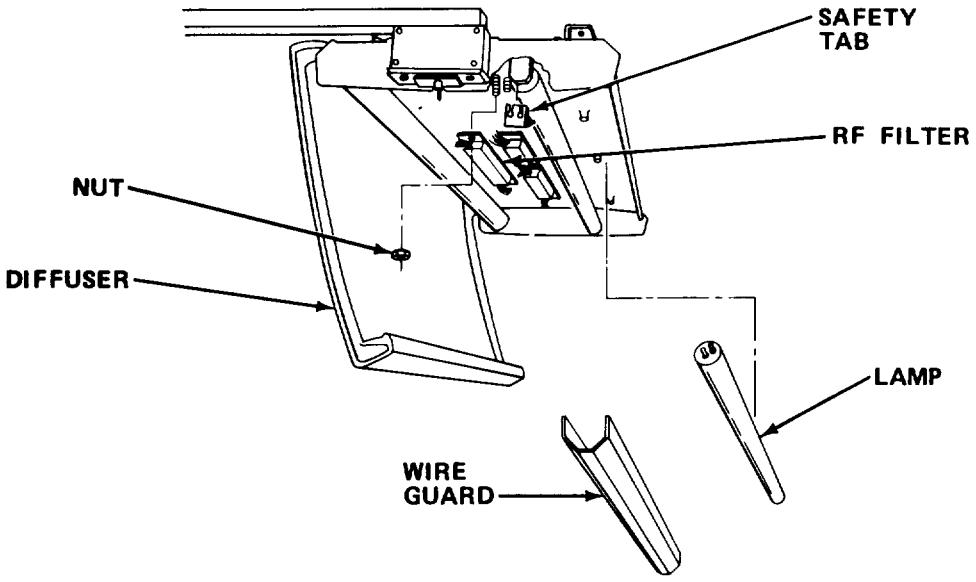
a. Turn overhead light switch OFF.

b. Remove diffuser from light fixutre.

c. Remove safety tabs and lamps. Place in diffuser.

d. Squeeze light wiring guard and remove.

e. Remove wire ties as required.



f. Tag wires to filter.

g. Remove **wire nuts and disconnect filter wires.**

h. Remove nuts and defective filter.

i. Install new filter. Secure with nuts.

j. Reconnect filter wires and secure with wire nuts.

k. Remove tags.

1. Install new wire ties.

NOTE

Be sure **wires are free of kinks and do not interfere with placement of** wire guard.

m. **Reinstall** wire guard.

n. Reinstall lamps and safety tabs.

o. Reinstall diffuser.

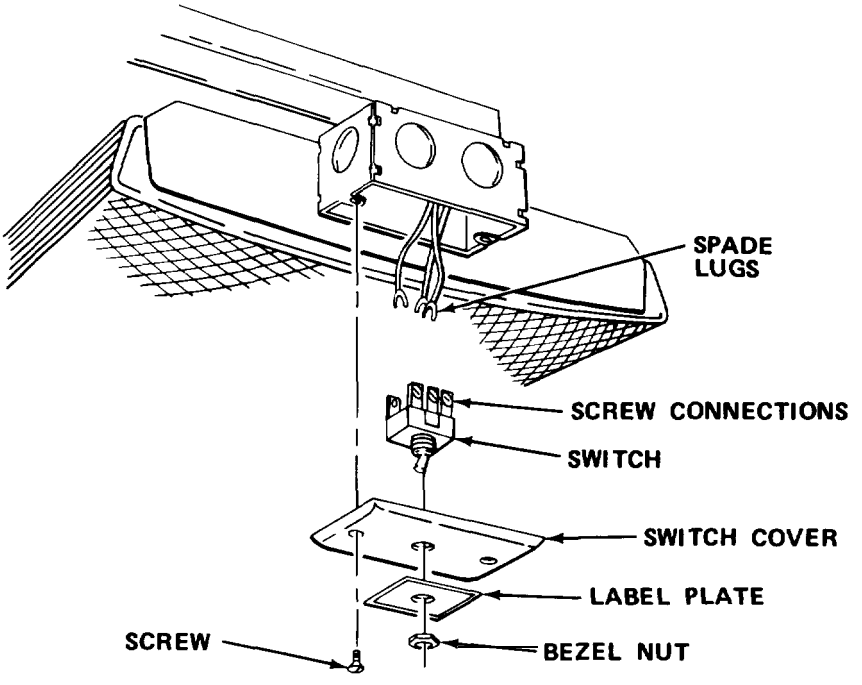
p. Turn on light switch.

1-16.3 Replace Fluorescent Lamp Switch.

MOS: 83FJ6, Reproduction Equipment Repairer
or
41B, Topographic Instrument Repair Specialist

TOOLS: Flat Tip Screwdriver
Needle Nose Pliers
Flashlight

SUPPLIES: Switch Assembly



WARNING

Death or serious injury may occur if lighting circuit breaker is not turned off before working on lamp assembly.

NOTE

Alternate lighting is required to perform this task.

a. Turn circuit breaker OFF.

b. Remove bezel nut.

c. Note notch on label plate and remove label plate.

d. **Loosen screws.**

NOTE

Note **position of cover and reinstall as noted.**

e. **Remove cover plate.**

f. **Tag and disconnect wires from defective switch.**

g. **Install new switch and connect wires.**

h. **Insert switch through cover plate and label plate.**

NOTE

Be **sure label plate is in same direction as** when removed. Secure with bezel nut.

i. Aline cover plate with holes and secure with screws.

j. Turn circuit breaker ON.

1-16.4 Replace On/Off Switch.

MOS: 83FJ6, Reproduction Equipment Repairer
or
41B, Topographic Instrument Repair Specialist

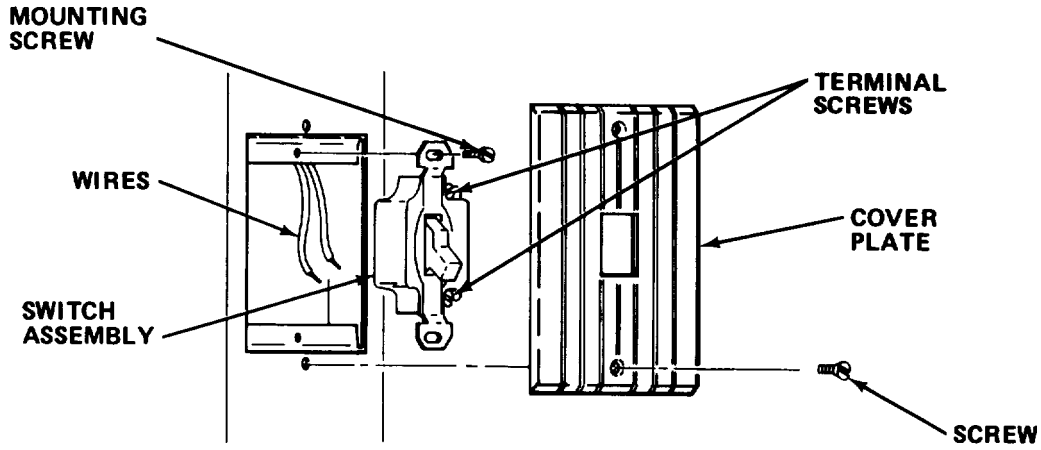
TOOLS: Flat Tip Screwdriver

SUPPLIES: Switch

WARNING

Death or serious injury may occur if switch circuit breaker is not turned off before working on switch.

a. Turn off appropriate circuit breaker.



b. Remove screws.

c. Remove cover plate.

d. Remove mounting screws.

e. Pull switch assembly from wire guide to gain access to wires.

f. Loosen terminal screws; then disconnect wires.

g. Install new switch.

h. Reconnect wires.

i. Guide switch into wire guide, alining holes.

NOTE

Be sure **wires are not kinked or strained.**

j. Reinstall mounting screws.

k. Reinstall cover plate and secure with screws.

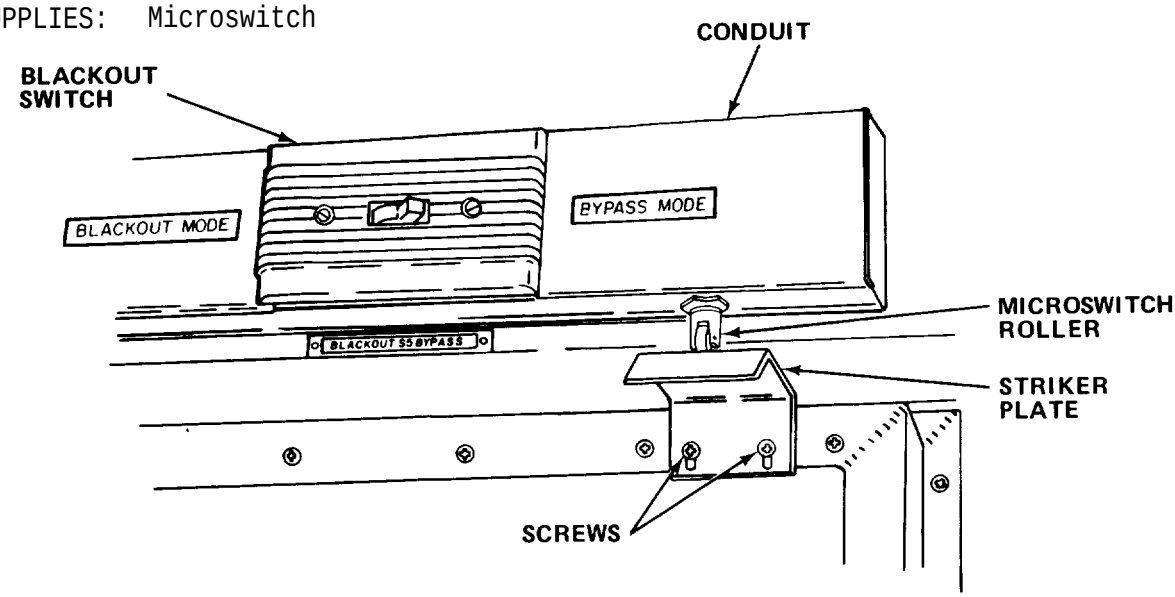
l. Turn on switch circuit breaker.

1-16.5 Replace Blackout/Dome Light Microswitch.

MOS : 83FJ6, Reproduction Equipment Repairer
or
41B, Topographic Instrument Repair Specialist

TOOLS: Flat Tip Screwdriver
6 in. Adjustable Wrench

SUPPLIES: Microswitch



WARNING

Death or serious injury may occur from electrical shock unless power is off before servicing.

a. Turn off blackout/dome light circuit breaker.

b. Remove conduit cover.

c. Remove nut and pull out switch to expose wiring.

d. Disconnect wires from defective switch.

e. Connect wires to new switch.

f. Install switch and secure with nut.

g. Adjust striker plate until plate contacts roller.

h. Reinstall conduit cover.

i. Turn on circuit breaker.

1-16.6 Replace Receptacle.

MOS : 83FJ6, Reproduction Equipment Repairer

41B, Topographic Instrument Repair Specialist

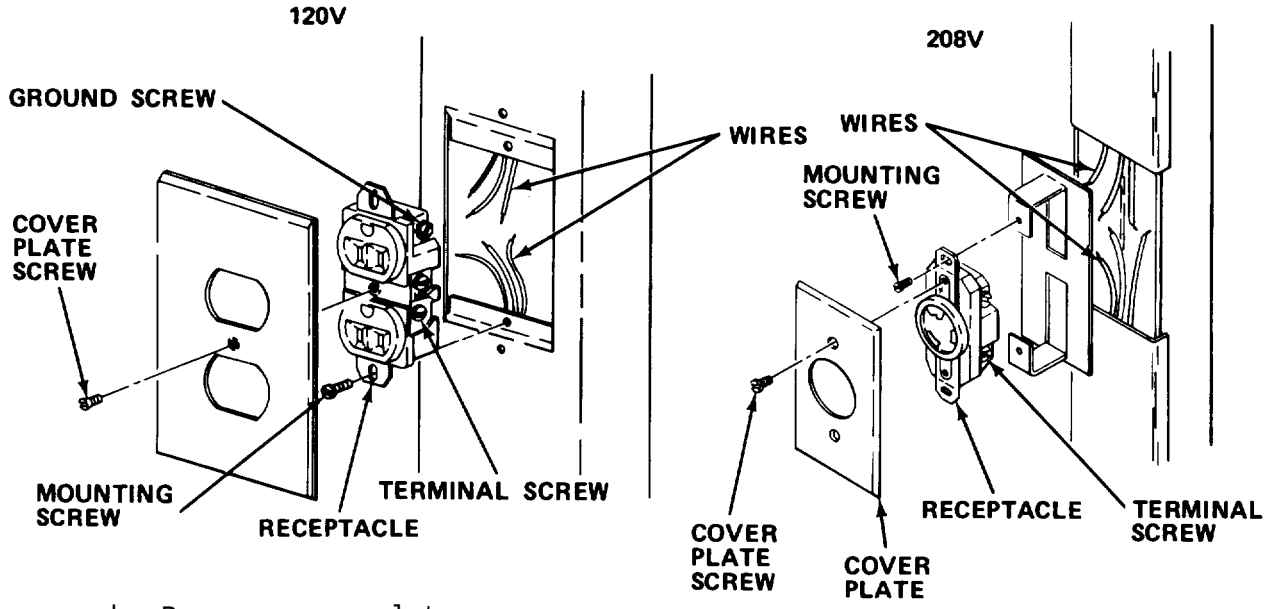
TOOLS : Flat Tip Screwdriver

SUPPLIES: Receptacle

WARNING

Death or serious injury may occur if receptacle circuit breaker is not turned off before working on receptacle.

a. Turn off receptacle circuit breaker.



b. Remove cover plate screws.

c. Remove cover plate.

d. Remove mounting screws.

e. Withdraw receptacle to gain access to wires.

f. Loosen terminal screws and ground screw; then disconnect wires.

g. Reconnect wires. Connect green (ground) wire first.

h. Install new receptacle.

i. Guide receptacle into **wire guide.**

NOTE

Be **sure wires are not kinked or strained.**

j. Secure receptacle with screws.

k. Reinstall cover plate. Secure with screws.

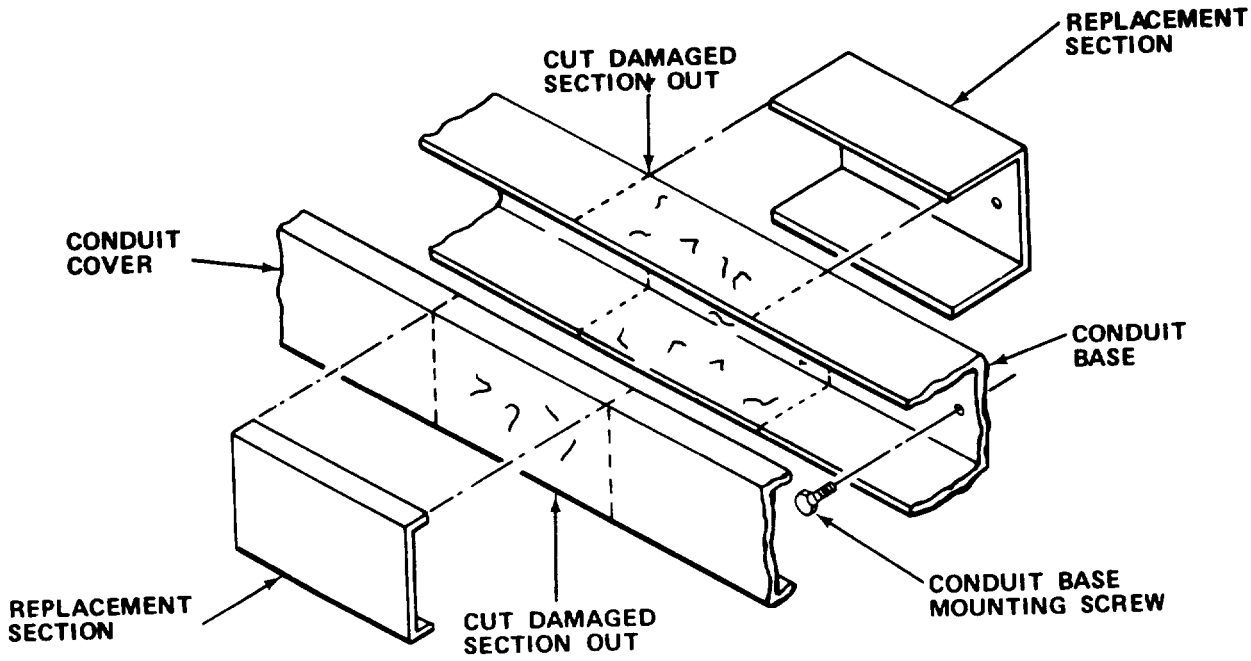
1. Turn on receptacle circuit breaker.

1-16.7 Replace Wire Molding.

MOS: 83FJ6, Reproduction Equipment Repairer
or
41 B, Topographic Instrument Repair Specialist

TOOLS: Flat Tip Sc, ewdriver
Hacksaw
Flashlight
Paint Brush
Multimeter
Drill and Bits
File
Machinist Rule

SUPPLIES: Paint (Item 18, Appendix E)
Cheesecloth (Item 7, Appendix E)
Conduit Base
Conduit Cover
Padlock



WARNING

Death or serious injury may occur from failure to turn off and padlock safety switch before repairing molding.

NOTE

Alternate lighting is required to perform this task

a. Turn off and padlock safety switch.

b. Remove conduit cover.

c. Inspect wires for damage.

NOTE

Refer to direct/general support maintenance for wiring repair if necessary.

d. Loosen wiring and carefully pull it from the entire base section.

e. Remove screws and base from wall.

f. Mark and measure damaged area on molding. Record measurement.

g. Cut damaged area from molding.

h. Cut section from new molding to the length recorded in step f.

i. Using damaged area as a template, mark mounting holes on new piece.

j. With a number 25 drill bit, drill holes in new molding.

k. With file, remove all burred edges.

l. Paint base section as required.

m. Reinstall conduit base on wall with screws.

n. Carefully place wiring back in conduit base.

o. Reinstall cover on base.

p. Test wiring for continuity between power wires and conduit. If there is continuity, determine and correct grounding fault.

q. Test wiring with power on.

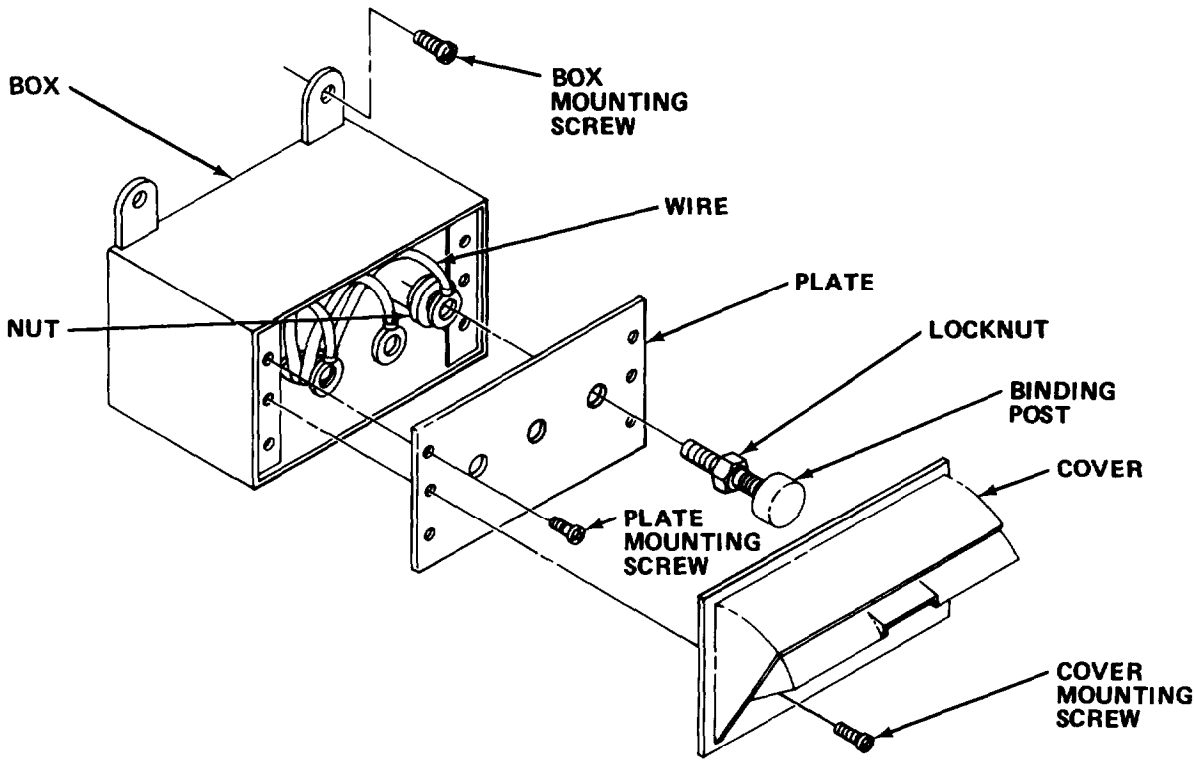
1-16.8 Repair Telephone Binding Post Assembly.

MOS : 83FJ6, Reproduction Equipment Repairer

416, Topographic Instrument Repair Specialist

TOOLS: Cross Tip Screwdriver
1/2 in. Combination Wrench

SUPPLIES: Binding Post Box
Binding Posts



a. Remove cover mounting screws. Remove cover.

b. Remove plate mounting screws to gain access to back of plate.

c. Tag wires for identification.

d. Remove nuts and wires from binding posts.

e. If required, remove box mounting screws and replace box.

f. Replace any defective binding posts. Secure wires to new posts and remove tags.

g. Reinstall box assembly and plate, and secure plate with screws.

h. Secure cover with screws.

1-16.9 Replace Exhaust Fan.

MOS: 83FJ6, Reproduction Equipment Repairer

41B, Topographic Instrument Repair Specialist

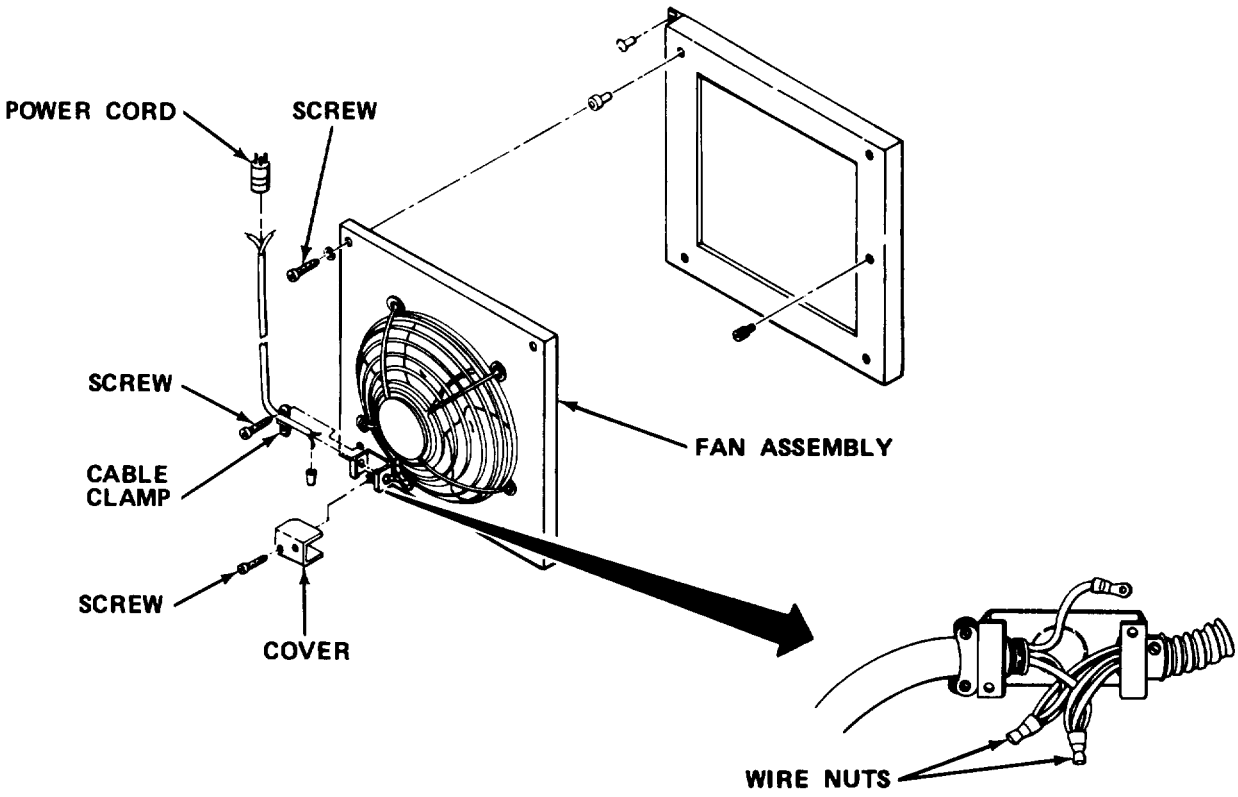
TOOLS: Flat Tip Screwdriver
Cross Tip Screwdriver
Wire Cutters

SUPPLIES: Fan Assembly
Wire Nuts
Power Cord

WARNING

Death or serious injury may occur if power is left on. Turn fan switch OFF and unplug power cord before working on exhaust fan.

a. Unplug power cord.



b. Remove screws and place fan assembly on work surface.

c. Loosen screws on cable clamp.

d. Remove screws and cover.

e. Tag wires and cut wire nuts from wires.

f. Remove power cord from defective fan assembly.

g. Install new fan.

h. Install new power cord.

i. Connect wires with wire nuts and remove tags.

j. Tighten cable clamp screws.

k. Reinstall cover. Secure with screws.

l. Reinstall fan assembly. Secure with screws.

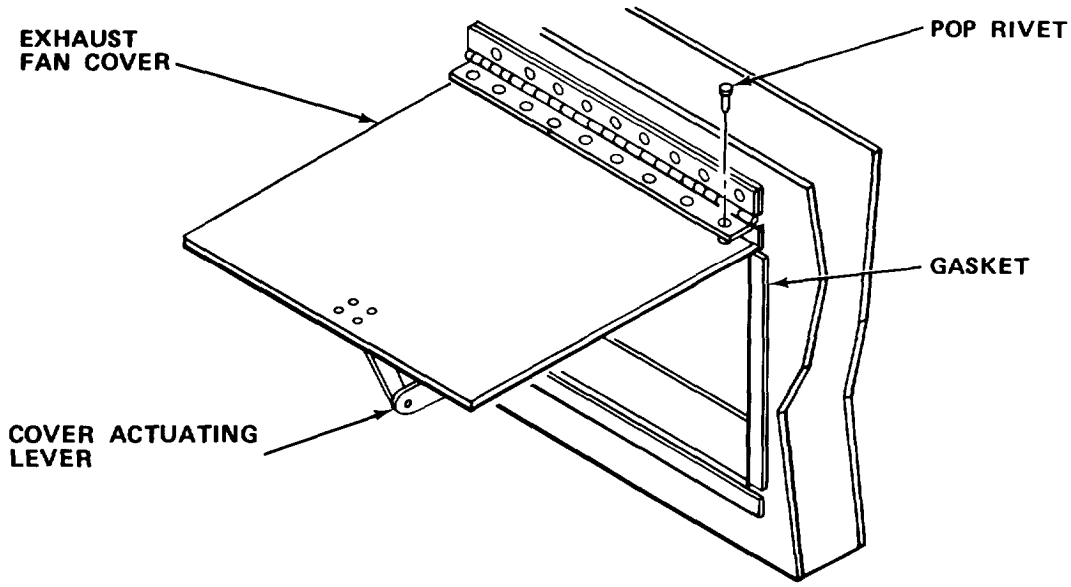
m. Plug in power cord.

1-16.10 Replace Exhaust Fan Cover.

MOS : 83FJ6, Reproduction Equipment Repairer
or
41B, Topographic Instrument Repair Specialist

TOOLS : Drill and Bits
Pop Rivet Gun
Scraper

SUPPLIES: Pop Rivets
Exhaust Fan Cover
Gasket
Solvent P-D-680 (Item 25, Appendix E)
Adhesive (Item 2, Appendix E)
Cheesecloth (Item 7, Appendix E)
Impermeable Gloves
Goggles



a. Drill pop rivets from hinged cover to remove vent cover.

b. Remove defective vent cover and transfer mounted hardware to new cover.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Wear solvent-impermeable gloves and eye/face protective equipment when using solvent. Do not use near open flame or excessive heat. Flash point of solvent is 100° F to 138° F (38° C to 59° C).

c. Scrape gasket off van body and clean area with solvent P-D-680.

d. Secure new gasket to van body with adhesive.

e. Aline exhaust fan vent cover and pop rivet to hinge.

f. Test cover for tightness of closure.

1-16.11 Replace Emergency Light Assembly.

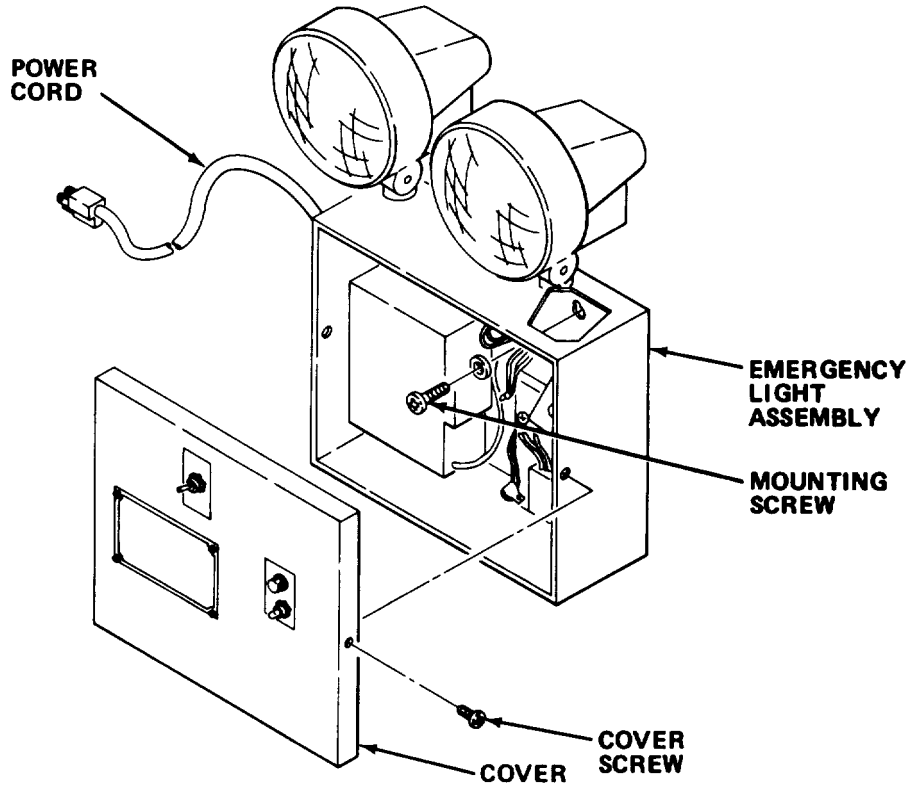
MOS: 83FJ6, Reproduction Equipment **Repairer**
or
416, Topographic Instrument Repair Specialist

TOOLS: Cross Tip Screwdriver
Flat Tip Screwdriver

SUPPLIES: Emergency Light Assembly

WARNING

Death or serious injury may occur if power cord is not unplugged before servicing light.



a. Unplug power cord.

b. Remove cover screws. Move cover out of way.

c. Remove mounting screws.

d. Remove emergency light assembly.

e. **Install new emergency light assembly.** Secure with screws.

f. Secure cover with screws.

g. Plug in power cord.

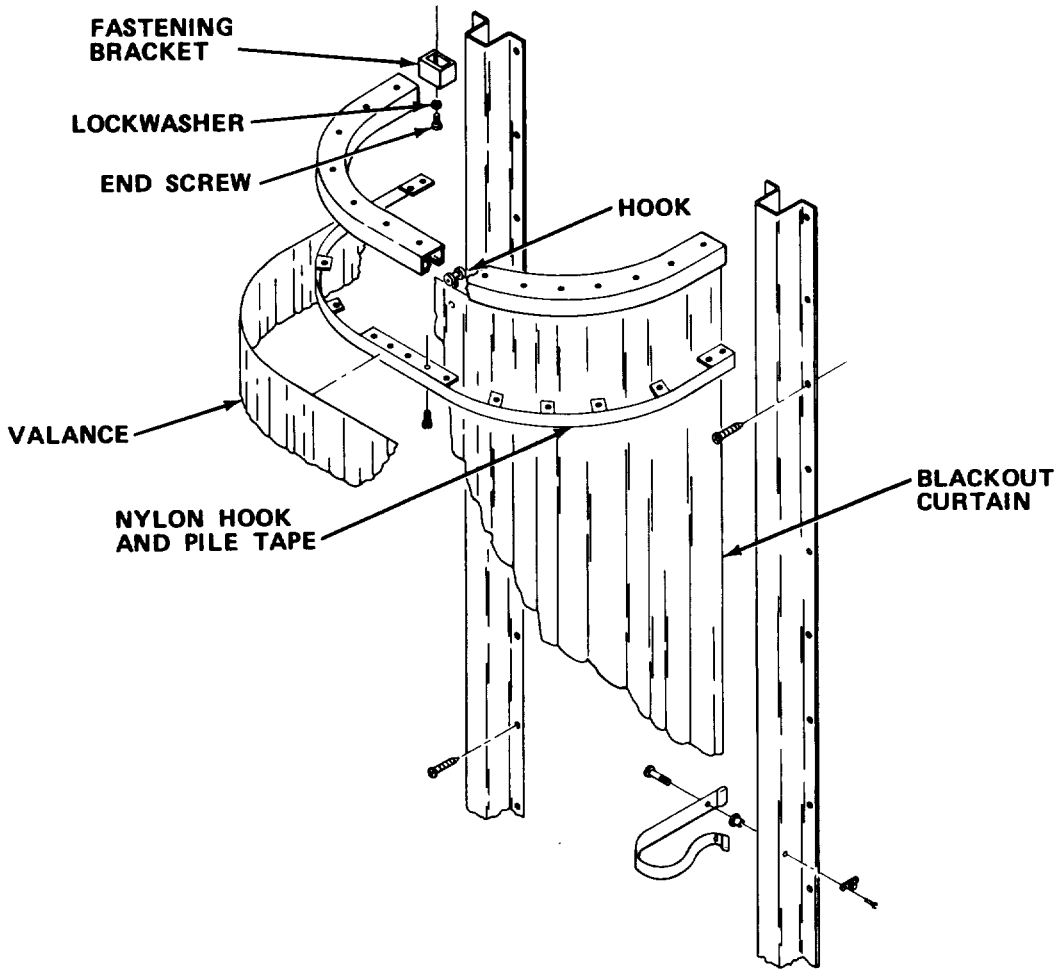
1-16.12 Repair Blackout Curtain.

MOS: 83FJ6, Reproduction Equipment Repairer

416, Topographic Instruument Repair Specialist

TOOLS: Cross Tip Screwdriver

SUPPLIES: Hooks
Val ante
Curtain
Nylon Hook and Pile Tape
Adhesive (Item 2, Appendix E)



a. Remove curtain from hooks.

b. Pull curtain and valance from nylon hook and pile tape.

c. Remove end screw, lockwasher, and fastening bracket from ceiling.

d. Replace damaged hooks.

e. Reinstall fastening bracket with hooks. Fasten with end screw and lockwasher.

f. Glue loose nylon hook and pile tape to wall or bracket. Replace tape if worn out.

g. Hook curtain to bracket.

h. Attach valance.

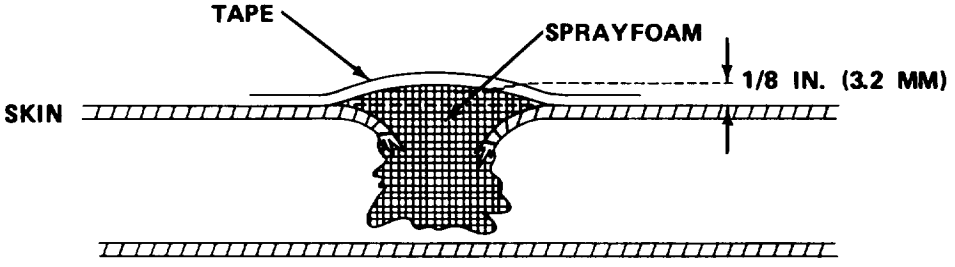
i. Check curtain for free movement.

1-16.13 Repair Van Body Skin (Temporary).

MOS : 52C, Utilities Equipment Repairer

TOOLS : Pliers
Ball Peen Hammer
Scissors or Utility Knife

SUPPLIES: Cloth Duct Sealing Tape (Item 29, Appendix E)
Silicone Sealant (Item 23, Appendix E)
Sprayfoam (Item 28, Appendix-E)
Cheesecloth, (Item 7, Appendix E)



a. Bend broken edges of punctured skin inward into puncture hole. Do not attempt to remove fragments of skin by bending or pulling outward. Bend skin inward only enough to put broken edges below surface of unbroken skin.

b. Remove any loose fragments of foam which are not now held in place by bent broken skin. Removing small pieces of foam or dust is more important than removing chunks.

c. Using cloth slightly dampened with water, wipe area around puncture to remove any dirt or mud and wipe dry.

d. Inject sprayfoam into puncture. Mound sprayfoam to about 1/8 in. (3.2mm) above surface of unbroken skin. Apply bead of sealant about 1/4 in. (6.4 mm) wide over all cuts in skin leading out from puncture. Do not smooth out sealant.

e. Plan how puncture is to be covered with tape before applying any tape. Length and width of tape, number of tape strips, overlapping, and how tape is applied will affect sealing capability of repair. Each piece of tape should extend about 1-1/2 in. (3.81 cm) beyond sealant it will cover. If this will require more than one strip of tape, tape should overlap about 1/2 in. (12.7 mm). If three or more strips of tape are required, center strip should be applied first.

f. Holding tape taut, apply it perpendicular to panel skin. Do not apply with rolling motion either end-to-end or center-to-ends. Do not rub each strip in place individually. Apply all strips lightly with proper overlap and rub into place.

g. If necessary, damaged tape can be replaced; however, it should be removed with careful peeling motion to avoid damage to sealant. If sealant also peels back, new sealant should be applied. Complete removal of old sealant is not necessary. Permanent repair by direct support, or higher category of maintenance, should be made as soon as possible.

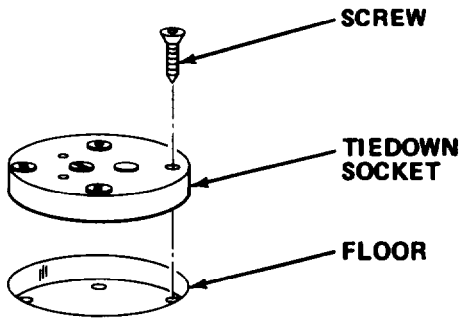
1-16.14 Replace Tiedown Socket.

MOS: 83FJ6, Reproduction Equipment Repairer

41B, Topographic Instrument Repair Specialist

TOOLS: Cross Tip Screwdriver
Flat Tip Screwdriver

SUPPLIES: Tiedown Socket



a. Remove screws from tiedown socket,

b. Pry defective socket from floor.

c. Install new tiedown socket. Rotate new tiedown socket enough to avoid installing screws in old screw holes.

d. Reinstall screws.

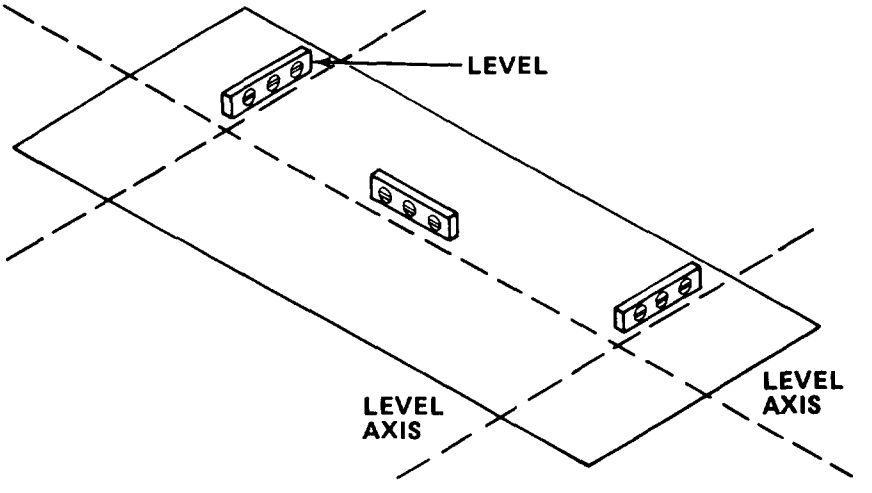
1-16.15 Repair Level Indicator.

MOS : 83FJ6, Reproduction Equipment Repairer

41B, Topographic Instrument Repair Specialist

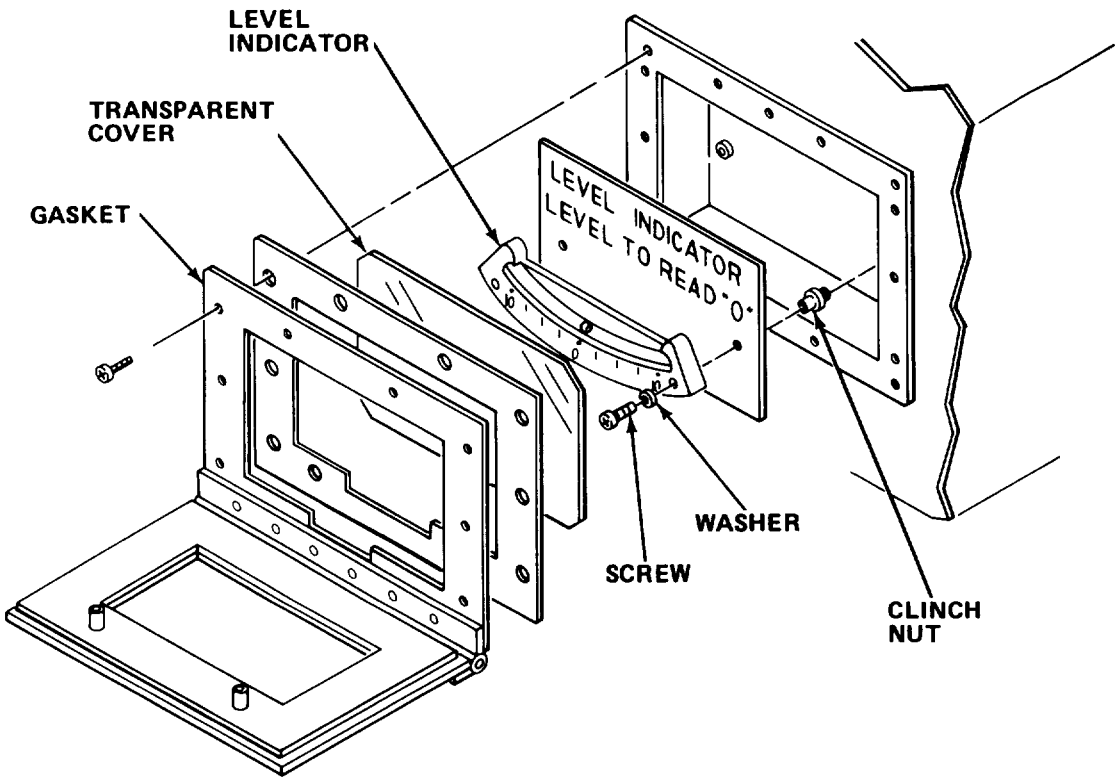
TOOLS: Carpenter's Level
Cross Tip Screwdriver
Knife, TL-29

SUPPLIES: Level Indicator
Gasket



a. Level section using level indicators. Then confirm section is level by using carpenter's level on floor inside section.

b. Adjust section leveling jacks until section is level as indicated by carpenter's level at front-rear and left-right at each end as shown in illustration.



c. Loosen knurled screws and move cover away from level assembly.

d. Remove screws and washers to release frame and gasket.

e. Remove transparent cover.

f. Remove screws and washers to remove level indicator.

g. Replace level assembly and secure with screws and washers.

h. Reinstall transparent cover.

i. Install new gasket.

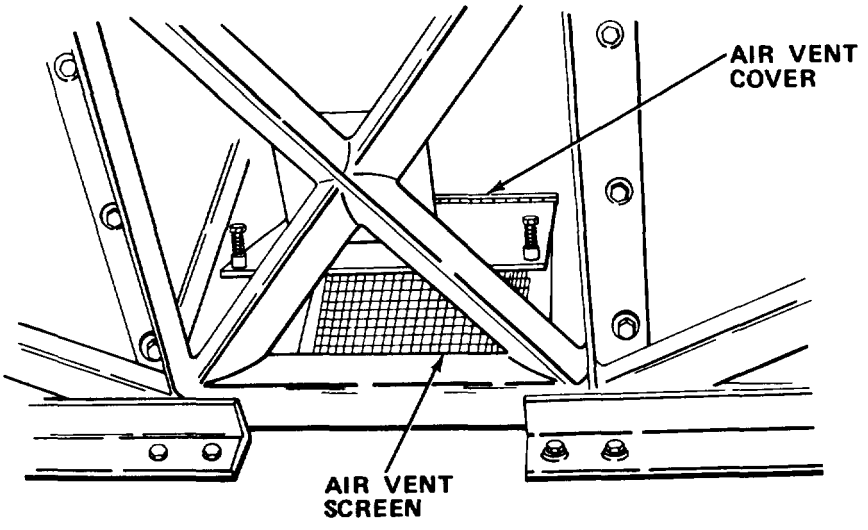
j. Reinstall frame and secure with screws and washers.

1-16.16 Replace Air Vent Screen.

MOS : 83FJ6, Reproduction Equipment Repairer
or
41B, Topographic Instrument Repair Specialist

TOOLS: Cross Tip Screwdriver
Scissors

SUPPLIES: Rubber Adhesive (Item 2, Appendix E)
Nylon Screen (Item 22, Appendix E)



a. Raise access cover and remove screws holding screen frame to section.

b. Remove screen and frame.

c. Clean all old screen material and adhesive from frame.

d. Cut new screen material to size and attach to frame with adhesive.

e. Reinstall frame to section and secure with screws. Lower cover.

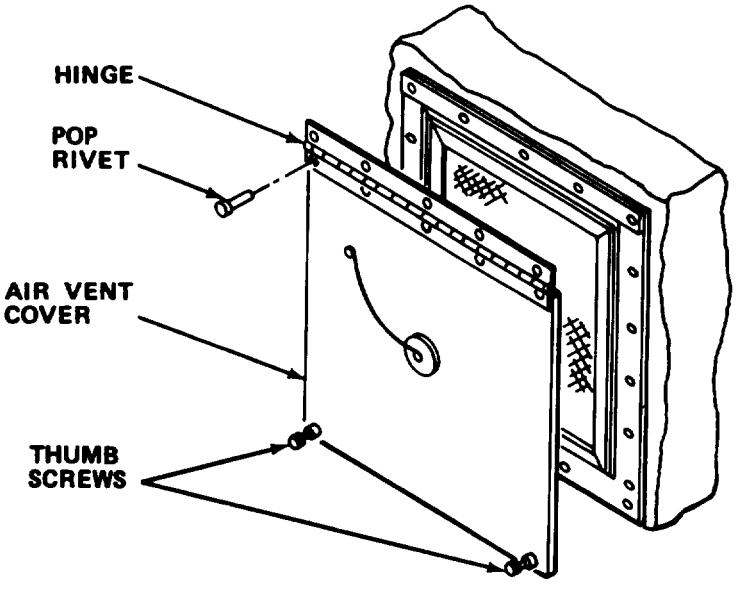
1-16.17 Replace Air Vent Cover

MOS: 83FJ6, Reproduction Equipment Repairer

41B, Topographic Instrument Repair Specialist

TOOLS: Drill and Bits
Pop Rivet Gun

SUPPLIES: Vent Cover
Pop Rivets



a. Loosen thumbscrews.

b. Drill pop rivets from hinge. Remove air vent cover.

c. Aline holes and pop rivet new air vent cover to section.

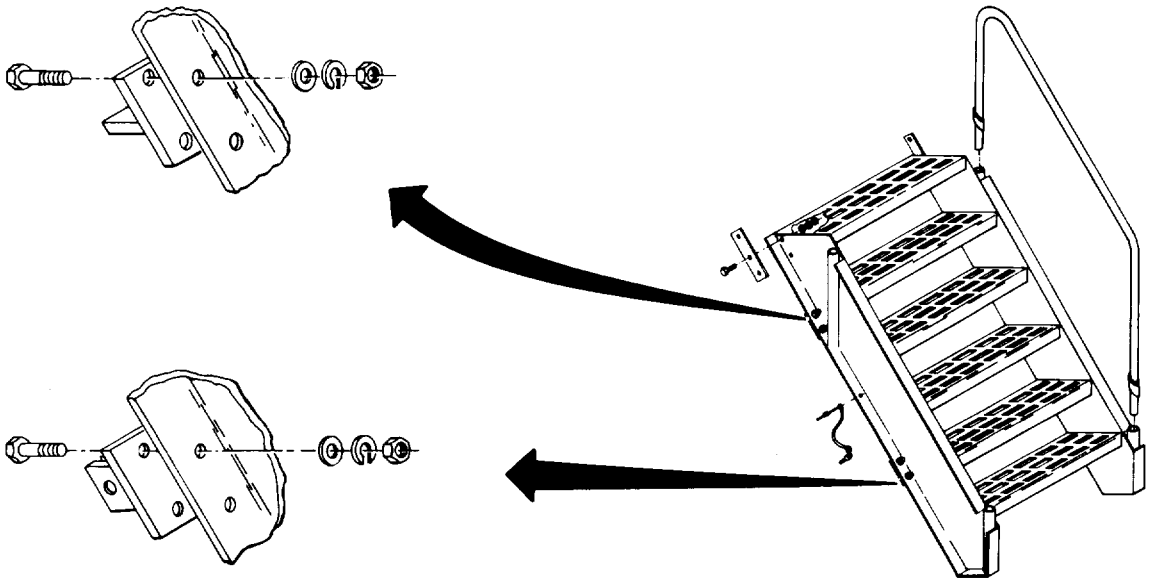
d. Tighten thumbscrews.

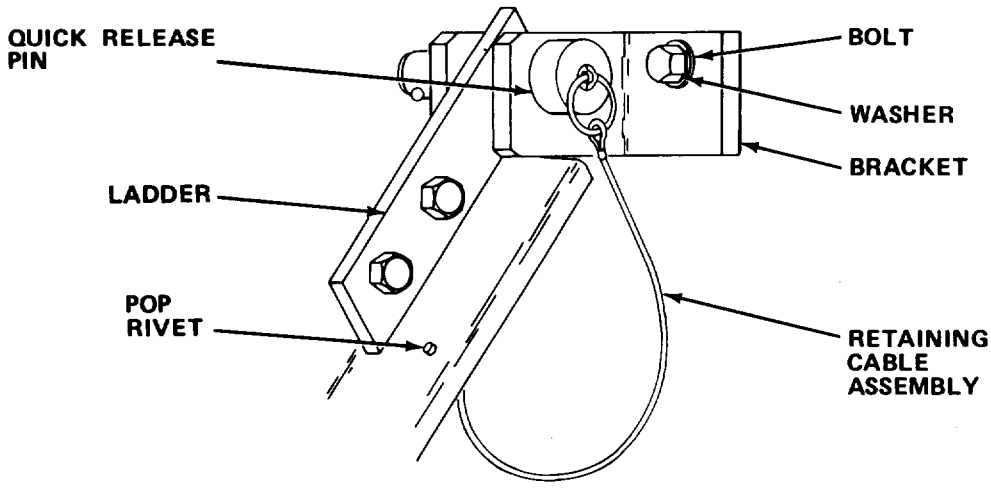
1-16.18 Repair personnel Ladder.

MOS: 63W, Wheel Vehicle Repairer

TOOLS: Drill and Bits
Pop Rivet Gun
9/16 in. Combination Wrench
8 in. Adjustable Wrench

SUPPLIES: Cable Assembly
Quick Release Pins
Pop Rivets
Mounting Brackets





a. Remove ladder from mounting bracket.

b. Remove bolts, washers, and nuts securing damaged mounting brackets to ladder.

c. Remove damaged cable assembly from ladder by drilling out rivet.

d. Reinstall or install new mounting brackets. Secure with bolts, washers, and nuts.

e. Rivet new cable assembly to ladder.

NOTE

Be sure ladder mounting brackets fit section on rear door and under personnel doors.

f. Reinstall ladder on mounting bracket.

1-17. PREPARATION FOR STORAGE OR SHIPMENT.

a. Section may be stored or shipped either mounted on trailer chassis or unmounted. Preparation of trailer chassis is covered in TM 5-2330-305-14 and should be referred to when trailer-mounted section is prepared for storage and shipment. TM 5-4120-367-14 must be reviewed for instructions covering air conditioner/heater.

b. Remove consumable supplies that have limited shelf life or broken seals. Replace missing items and be sure that all remaining consumable supplies are at authorized levels. Be sure all major components are operational.

c. Remove all unauthorized or personal equipment from section.

d. Move all classified material or sensitive data to proper storage. Complete all accountability and/or transfer of documents.

e. Refer to Preparation for Movement (paragraph 1-6.2) and follow applicable steps and any additional steps directed by proper authority.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

1-18. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT,

1-18.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

1-18.2 Special Tools; Test, Measurement, and Diagnostic Equipment; and Support Equipment. Special Tools, TMDE, and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.

1-18.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-6675-324-24P covering direct/general support maintenance for this equipment.

1-18.4 Electrical System. Direct/general support level of maintenance for the repair of the section's electrical system will consist of electrical wiring repair using standard electrical wiring repair procedures.

1-19. DIRECT/GENERAL SUPPORT TROUBLESHOOTING PROCEDURES.

a. Direct/general support troubleshooting procedures cover the most common malfunctions that may be repaired at the direct/general support level. Repair or adjustment requiring specialized equipment is not authorized unless such equipment is available. Troubleshooting procedures used by lower level maintenance should be conducted in addition to the direct/general support troubleshooting procedures.

b. This manual cannot list all the possible malfunctions or every possible test/inspection and corrective action. If a malfunction is not listed or corrected by a listed corrective action, notify your supervisor.

For unidentified malfunctions, use the facing schematic or the foldout located at the end of this manual for further fault analysis.

Table 1-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
1. PERSONNEL/CARGO DOORS DO NOT CLOSE COMPLETELY.	
Step 1. Check that latch rollers rotate freely.	Replace latches (paragraph 1-20.2).
Step 2. Check to see if latch rods are bent.	Replace latch rods (paragraph 1-20.2).
Step 3. Check to see if door gasket is torn or broken.	Replace door gasket (paragraph 1-20.3)
2. PERSONNEL/CARGO DOORS DO NOT LATCH PROPERLY.	
Check door latch for missing or damaged components.	Replace door latch (paragraph 1-20.2)
3. AIR OR WATER ENTERS SECTION AROUND DOOR.	
Check to see if door gasket is worn or broken.	Replace door gasket (paragraph 1-20.3)
4. RECEPTACLES DO NOT OPERATE BUT CIRCUIT BREAKERS ARE ON.	
WARNING Turn off main circuit breaker before inspecting or servicing circuit breakers or receptacles. Failure to do so may result in death or serious injury.	
Step 1. Check to see if power cable is firmly connected to power entry panel.	Connect power cable.

Table 1-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
4. RECEPTACLES DO NOT OPERATE BUT CIRCUIT BREAKERS ARE ON - Cont	
Step 2. Check to see if voltage meter and frequency scale and INCORRECT PHASE or CORRECT PHASE lamp indicate necessary power.	Notify your supervisor for service of power supply at source.
5. CIRCUIT BREAKERS TRIP CONTINUALLY.	
	WARNING Turn off and padlock safety switch before inspecting or servicing circuit breakers or receptacles. Failure to do so may result in death or serious injury.
Step 1. Check to see if receptacles are overloaded.	Reconnect equipment to different receptacles.
Step 2. Check to see if receptacles are damaged.	Replace receptacles (paragraph 1-16.6)

1-20. MAINTENANCE PROCEDURES.

a. This section contains instructions covering direct/general support maintenance functions for the Information Section. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

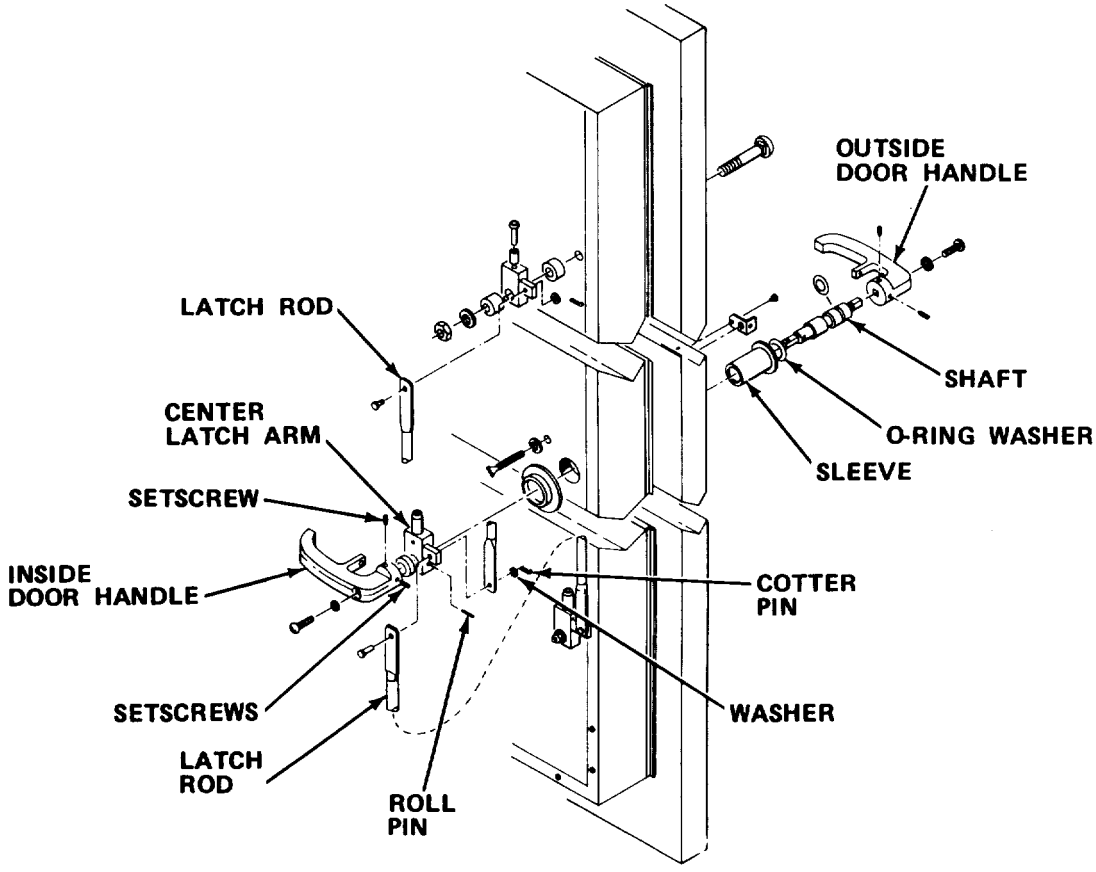
INDEX

1-20.1 Repair personnel Door Handle.

MOS: 63W, Wheel Vehicle Repairer

TOOLS: Cross Tip Screwdriver
Needle Nose Pliers
15/16 in. Combination Wrench
Hammer
Center Punch
1/8 in. Hex Head Key Wrench

SUPPLIES: O-Ring Washer
Sleeve
Roll Pin
Personnel Door Handle
Cheesecloth (Item 7, Appendix E)
Oil, Lubricating, General Purpose (Item 14, Appendix E)
Hand Oiler
Cotter Pin



a. Loosen screw and socket head setscrews. Remove defective inside door handle.

b. Remove cotter pin and pins from center latch arm assembly.

c. Move latch rods out of way.

d. Punch roll pin from center latch arm assembly and pull latch arm assembly from shaft.

e. Withdraw latch and defective outside door handle.

f. Inspect all components for wear.

g. Replace worn O-ring washer and sleeve.

h. Replace other worn components as needed.

i. Reinstall latch and new outside door handle.

j. Aline center latch arm assembly on shaft. Secure with new roll pin.

k. Aline latch rods. Attach to latch arms with pins, washers, and new cotter pin.

l. Reinstall new inside door handle.

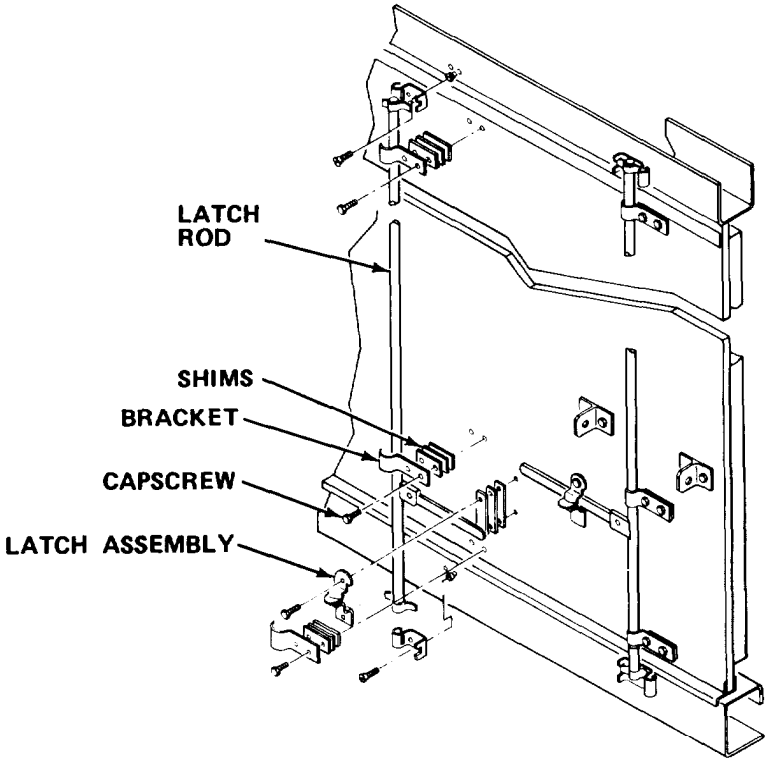
m. Lightly oil all moving parts. Wipe up surplus oil.

1-20.2 Replace Cargo Door Latch Assembly.

MOS: 63W, Wheel Vehicle Repairer

TOOLS: 9/16 in. Combination Wrench

SUPPLIES: Cargo Door Latch Assembly



a. Unlock latch.

b. Remove capscrews and washers from brackets. Remove brackets and shims.

c. Remove defective latch assembly and latch rod.

d. Install new latch assembly and latch rod.

e. Reinstall shims, brackets, washers, and capscrews.

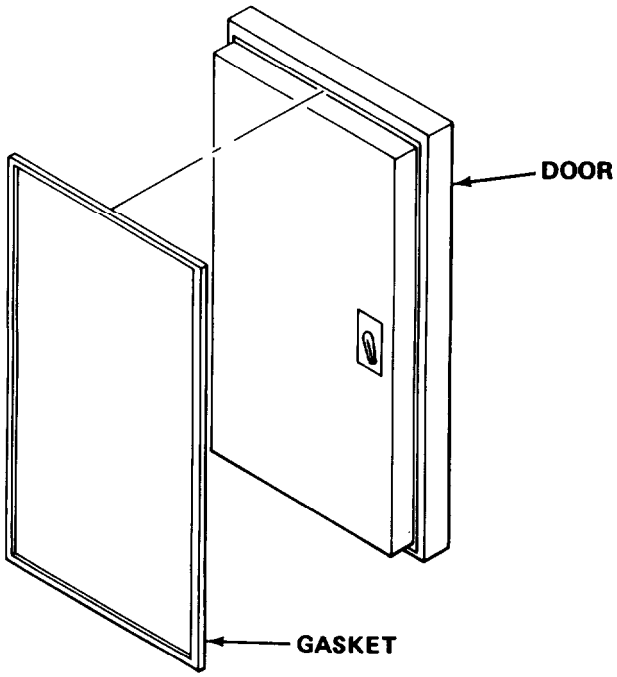
f. Check movement of latch rod and latch assembly. Lock latch.

1-20.3 Replace Personnel/Cargo Door Gasket.

MOS: 63W, Wheel Vehicle Repairer

TOOLS: Knife

SUPPLIES: Vinyl Gasket
Adhesive (Item 3, Appendix E)
Solvent P-D-680 (Item 25, Appendix E)
Impermeable Gloves
Goggles



a. Open door completely and secure in open position.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Wear solvent-impermeable gloves and eye/face protective equipment when using solvent. Do not use near open flame or excessive heat. Flash point of solvent is 100° F to 138° F (38° C to 59°C).

b. Remove defective gasket by prying gasket from door. Scrape traces of gasket and adhesive from door. Wash with solvent P-D-680.

c. Coat gasket area on door with adhesive.

d. Firmly press new gasket onto door.

e. Wipe excess adhesive from gasket.

f. Close door and wipe excess adhesive from door and frame.

g. Allow adhesive to dry before using door.

1-20.4 Replace Personnel/Cargo Doors.

MOS: 63W, Wheel Vehicle Repairer

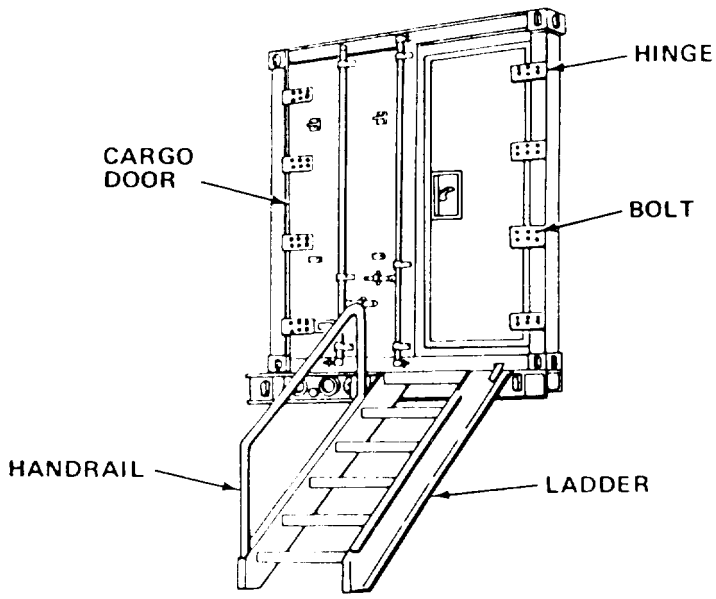
PERSONNEL: Two persons are required to perform this procedure.

TOOLS: Pop Rivet Gun
Electric Drill and Bits
Hoist
3/4 in. Combination Wrench
Paint Brush

SUPPLIES: Personnel/Cargo Door
Pop Rivets
Vinyl Gasket
Paint (Items 17, 17A and 17B, Appendix E)
Paint (Item 18, Appendix E)
Adhesive (Item 3, Appendix E)
Cheesecloth (Item 7, Appendix E)

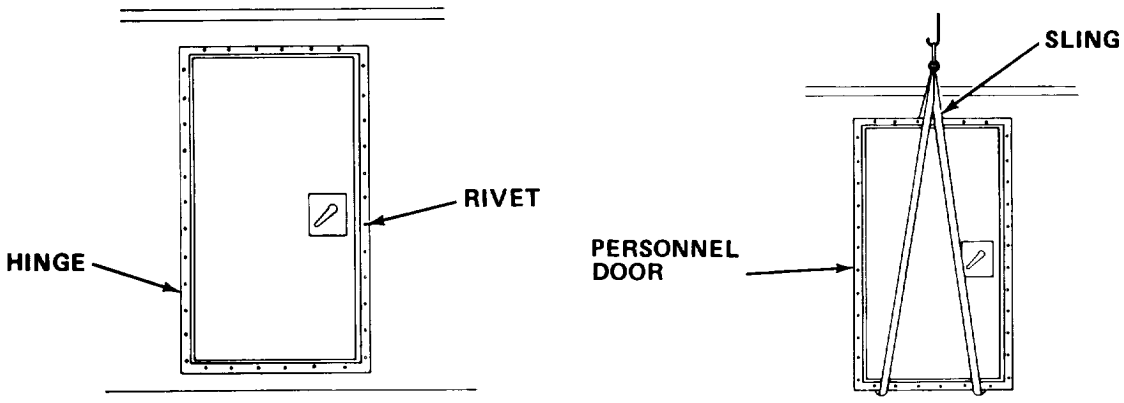
WARNING

To prevent personal injury or equipment damage, do not attempt to remove doors unless suitable lifting equipment and hoist are available.



a. Remove handrails and ladders if rear cargo door is to be replaced

b. Unlock and open door to be replaced.



c. Place sling around door and put a slight strain on hoist to remove weight from hinges.

d. Remove bolts from hinges on rear personnel door. On side personnel door, drill out pop rivets from hinge. Remove hinges from door.

e. Remove damaged door using hoist.

f. Install new door using hoist.

g. Reinstall hinges on rear personnel door. Secure with bolts. Reinstall hinges on side personnel door. Secure with pop rivets.

h. Remove sling from door.

i. Install new gaskets on door after it is mounted (paragraph 1-20.3).

j. Repaint as needed.

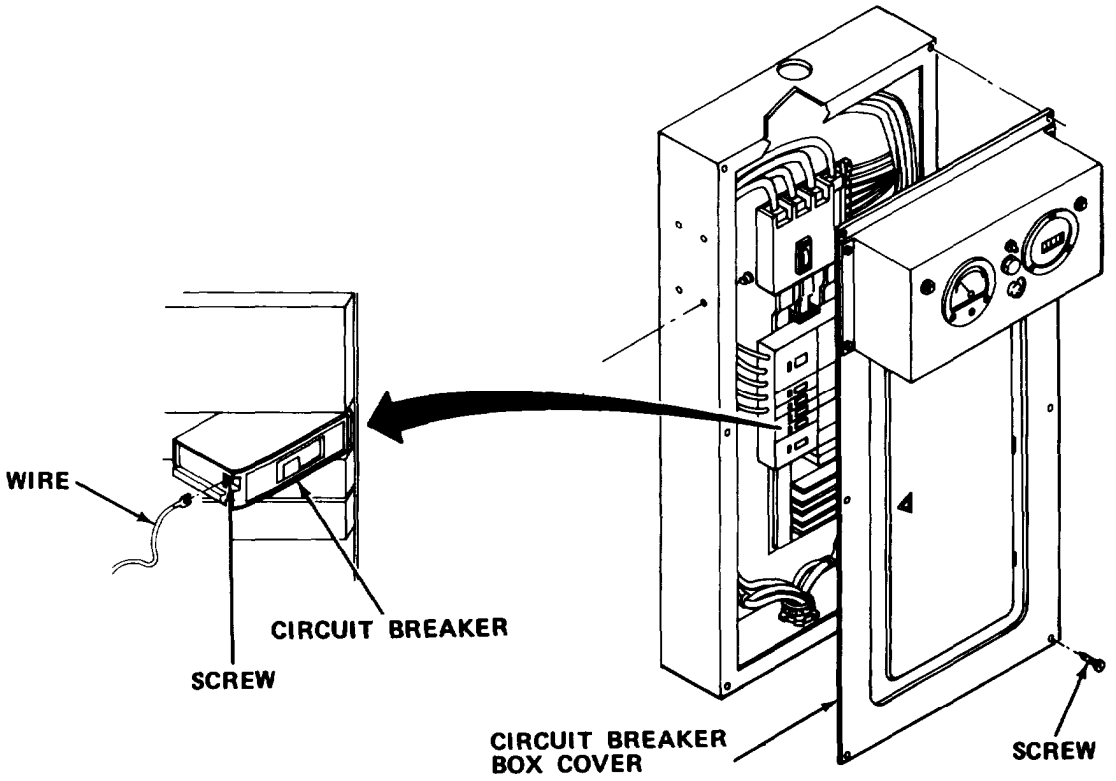
k. Close and lock door.

1-20.5 Replace Circuit Breaker.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
Multimeter

SUPPLIES: Circuit Breaker



WARNING

Turn off and padlock safety switch. Turn off all individual circuit breakers before inspecting or servicing circuit breakers. Failure to do so may result in death or serious injury.

a. Turn off and padlock safety switch. Turn off individual circuit breakers.

b. Remove circuit breaker box cover.

c. Use multimeter to make sure voltage is not present.

d. Remove defective circuit breaker by pushing and snapping out of place.

e. Tag and remove wires from defective circuit breaker.

f. Pull circuit breaker from panel.

g. Reconnect wires to new circuit breaker. Secure wires with screws.

h. Install new circuit breaker by pushing and snapping into place.

i. Reinstall circuit breaker box cover.

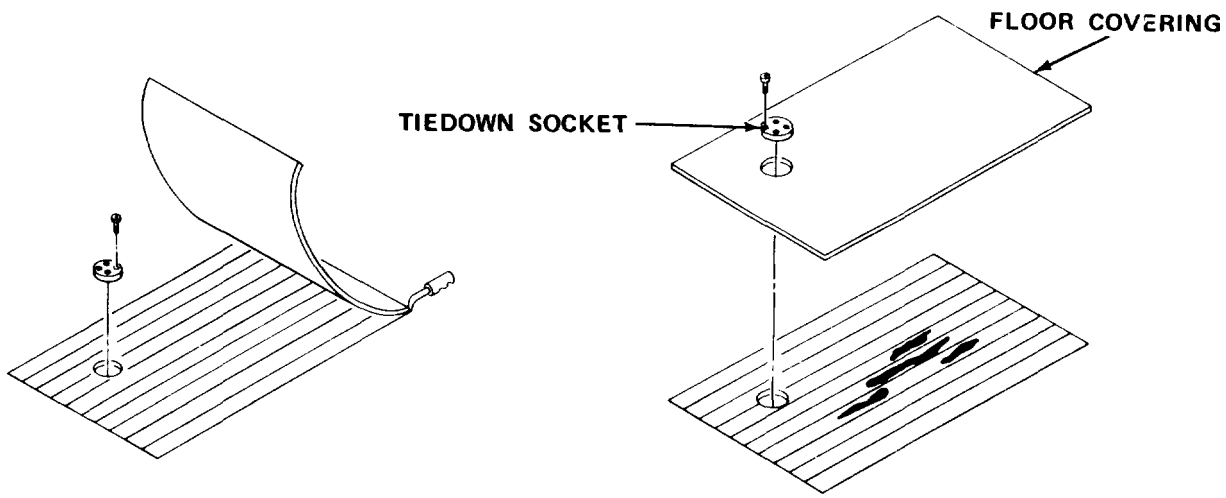
j. Remove padlock and turn on safety switch and individual circuit breakers.

1-20.6 Repair Floor Covering.

MOS: 52C, Utilities Equipment Repairer

TOOLS: Utility Knife
Cross Tip Screwdriver
Scraper
Straightedge

SUPPLIES: Vinyl Floor Covering
Epoxy Resin (Item 21, Appendix E)
Floor Patch (Item 11, Appendix E)
Cheesecloth (Item 7, Appendix E)
Adhesive (Item 3, Appendix E)



a. Cut a rectangular area from damaged floor covering.

b. Remove tiedown socket. Remove damaged floor covering.

c. Cut new floor covering to fit. Apply adhesive to floor. Press down new floor covering.

d. Reinstall tiedown socket.

1-20.7 Repair Van Body Skin (Permanent).

MOS: 63W, Wheel Vehicle Repairer

TOOLS: Pop Rivet Gun
Electric Drill and Bits
Paint Brush

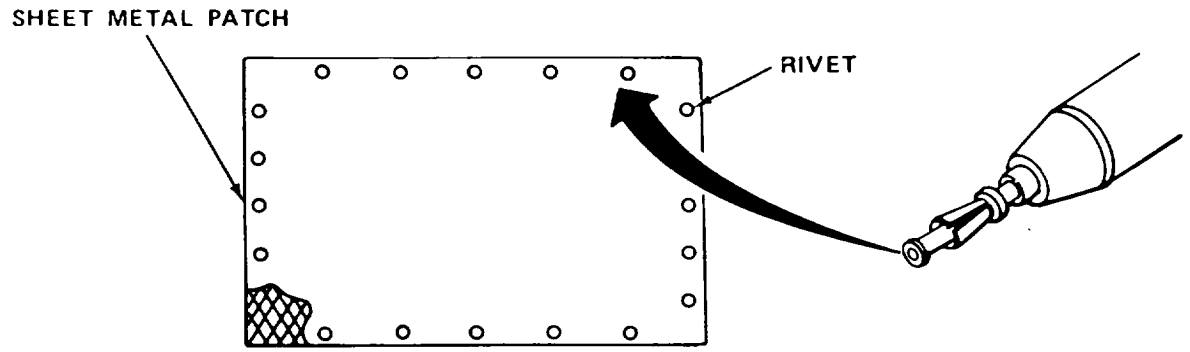
SUPPLIES: Pop Rivets
Sprayfoam Sealant (Item 28, Appendix E)
Silicone Sealant (Item 23, Appendix E)
Sheet Metal
Paint (Items 17, 17A and 176, Appendix E)
Cheesecloth (Item, 7 Appendix E)

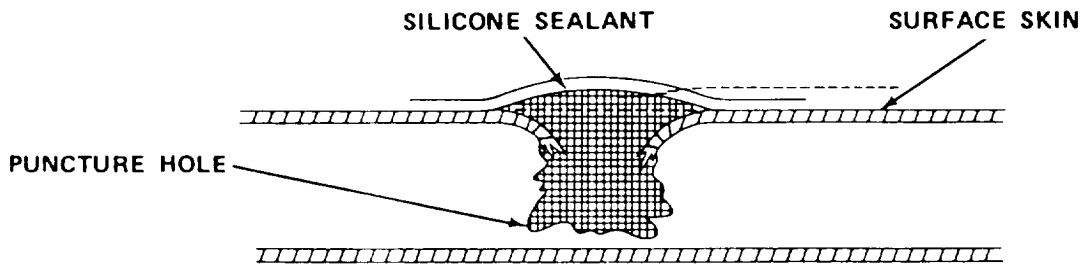
a. Bend broken edges of skin inward into puncture hole. Do not attempt to remove fragments of skin by bending or pulling out.

b. Remove any loose fragments of foam.

c. Use cloth dampened with water to clean area around puncture. Wipe dry.

d. Inject sprayfoam into puncture. Fill to 1/8 in. (3.2 mm) above surface of unbroken skin. Apply sealant to cracks leading to puncture.





e. Prepare sheet metal patch large enough to cover damaged area with overlap.

f. Place patch over damaged area and mark all around edges of patch.

g. Drill holes 1 in. (25.4 mm) apart.

h. Apply sealant to edges of patch.

i. Apply patch to van body.

j. Install pop rivets beginning at center of each side. Rivets should be placed 1 in. (25.4 mm) apart.

k. Paint as needed.

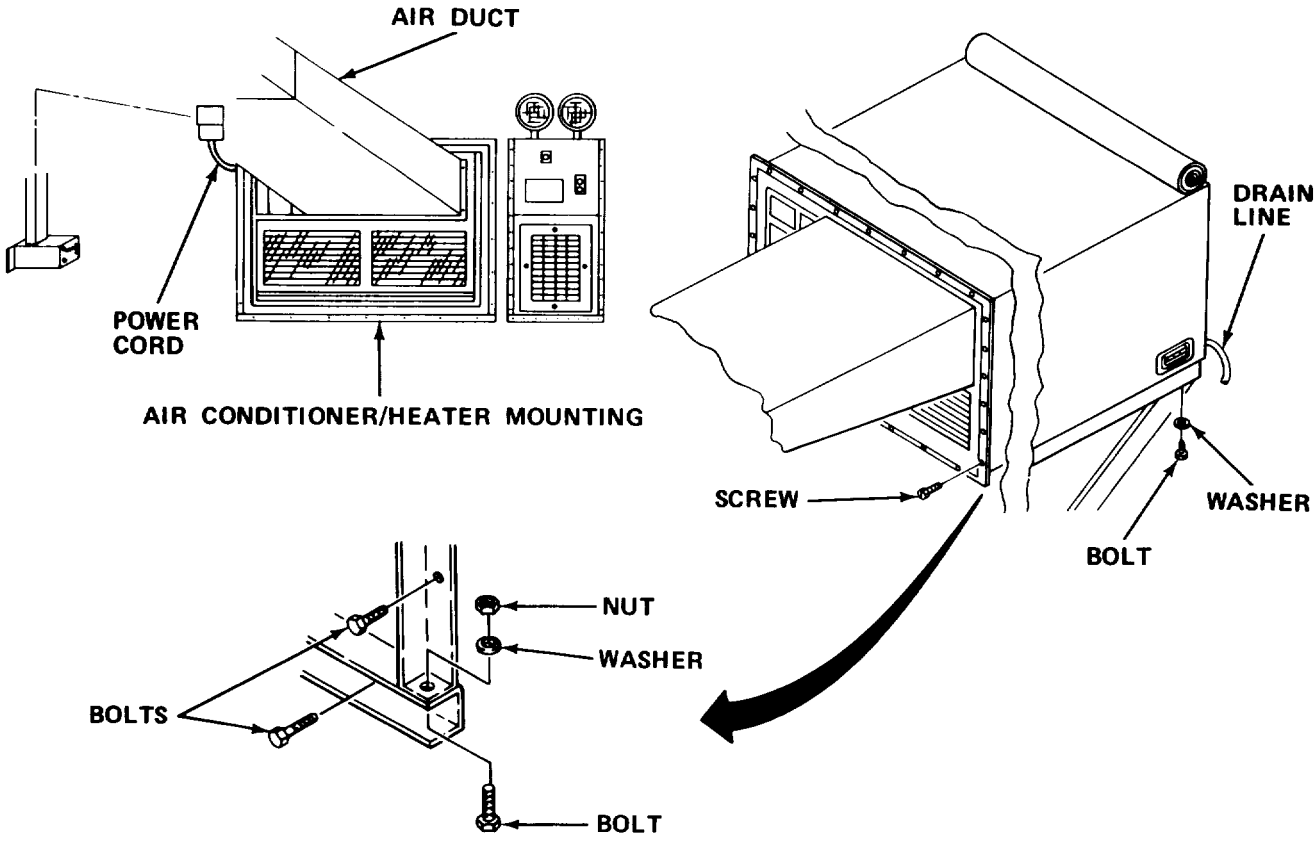
1-20.8 Replace Air Conditioner/Heater.

MOS: 63W, Wheel Vehicle Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS : Cross Tip Screwdriver
Lifting Equipment
8 in. Adjustable Wrench
7/16 in. Combination Wrench

SUPPLIES: Air Conditioner/Heater
Solvent P-D-680 (Item 25, Appendix E)
Gasket
Silicone Sealant (Item 23, Appendix E)
Adhesive (Item 3, Appendix E)



WARNING

- Use hoist or proper lifting equipment to replace air conditioner/heater. Failure to do so may result in death or serious injury.
- Turn off air conditioner/heater circuit breaker and unplug power cord. Failure to do so may result in death or serious injury.

a. Turn off air conditioner/heater circuit breaker. Unplug or disconnect power cord as appropriate.

b. Remove screws holding air duct to air conditioner/heater.

c. Remove nut. washer, and screw from each corner of air conditioner/heater mounting. Remove screws securing mounting to van wall.

d. Disconnect drain line from air conditioner/heater.

e. Attach sling to lifting handles. Raise hoist enough to remove slack from sling.

f. Remove mounting bolts and washers.

g. Slide out air conditioner until other lifting handles are free. Attach sling to handles.

h. Raise defective air conditioner/heater with hoist until unit is free from brackets and section.

i. Place air conditioner/heater on flat-bed truck or pallet.

WARNING

Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Wear solvent-impermeable gloves and eye/face protective equipment when using solvent. Do not use near open flame or excessive heat. Flash point of solvent is 100°F to 138°F (38°C to 59°C).

j. Clean seal, ant from opening using dry cleaning solvent P-D-680.

k. Remove damaged gasket and replace with new gasket.

l. Raise air conditioner/heater until it rests on air conditioner/heater brackets.

m. Remove two sling hooks as unit is eased into hole until grille touches duct.

n. Remove remaining sling.

o. Reinstall washers and mounting bolts.

p. Reconnect drain lines.

q. Reinstall screws securing air conditioner/heater mounting to section wall. Reinstall screw, washer, and nut to each corner of mounting.

r. Reinstall screws securing air duct to air conditioner/heater.

s. Reconnect or plug in power cord. Turn on air conditioner/heater circuit breaker.

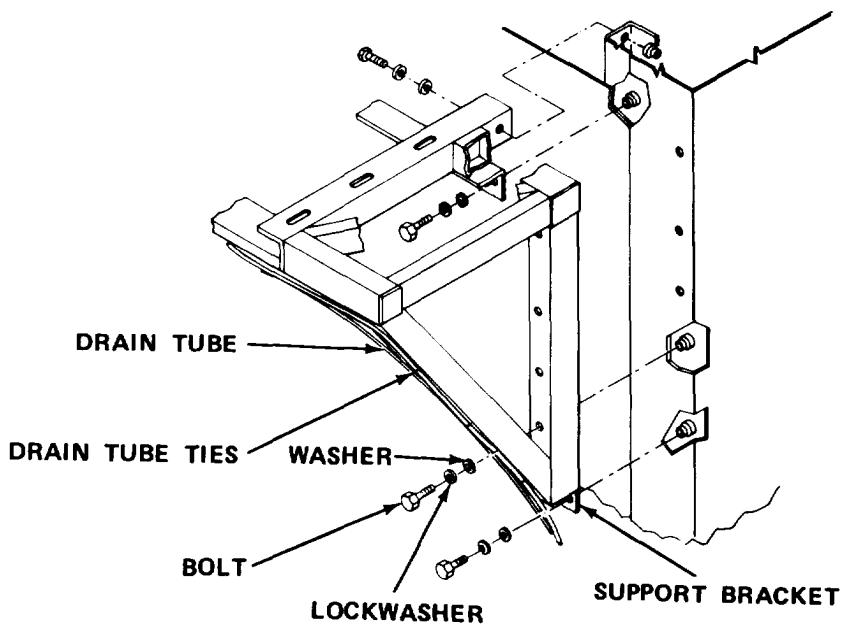
1-20.9 Replace Air Conditioner Support Bracket.

MOS: 63W, Wheel Vehicle Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS: 9/16 in. Combination Wrench
Lifting Equipment
Knife, TL-29

SUPPLIES: Air Conditioner Support Bracket
Drain Tube Ties



WARNING

Serious injury to personnel or damage to equipment may occur unless two or more personnel are used to remove and replace air conditioner/heater because of weight and balance of air conditioner/heater.

a. Remove air conditioner/heater (paragraph 1-20.8).

b. Cut drain tube ties, and remove drain tube from support bracket.

c. Remove bolts, lockwashers, and washers securing support bracket.

d. Remove defective support bracket.

e. Install new support bracket. Secure to van with bolts, lockwashers, and washers.

f. Reinstall drain tube on support bracket, and secure with new ties.

g. Reinstall air conditioner/heater (paragraph 1-20.8).

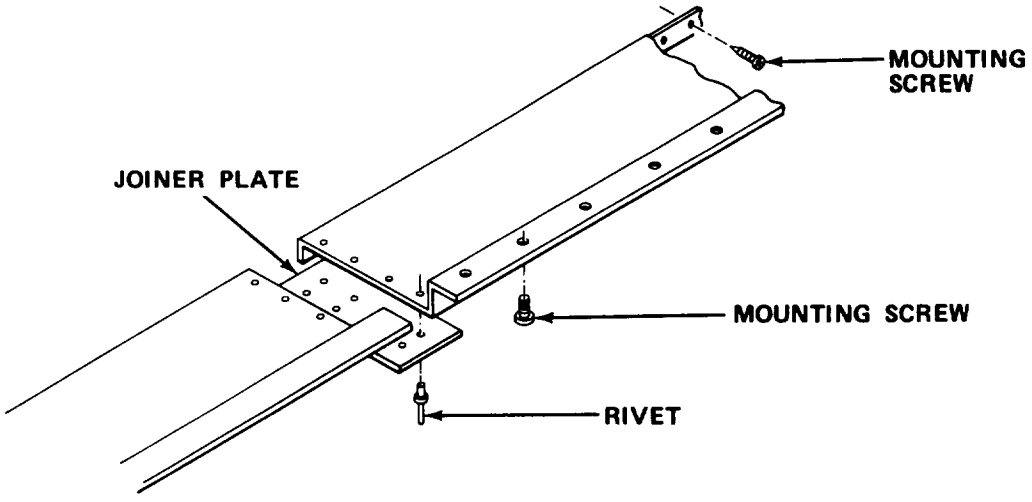
1-20.10 Replace Ventilation Duct.

MOS: 52C, Utilities Equipment Repairer

TOOLS: Hacksaw
Electric Drill and Bits
Ball Peen Hammer
Pop Rivet Gun
Paint Brush
Cross Tip Screwdriver

SUPPLIES: Silicone Sealant (Item 23, Appendix E)
Wood Block
Pop Rivets
Paint (Item 18, Appendix E)
Cheesecloth (Item 7, Appendix E)
Salvaged Ventilation Duct

a. Turn off air conditioner/heater so air will not blow through duct.



b. Drill rivets from damaged section of duct. Remove joiner plates.

c. Remove mounting screws to remove damaged sections of duct.

d. Straighten remaining sections of duct at edges using hammer and wood block.

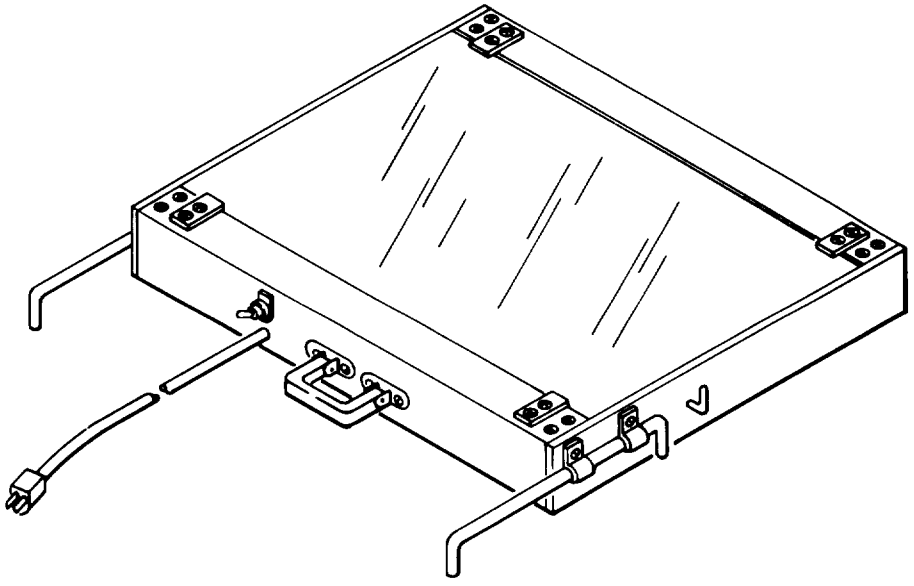
e. Place sealant on mounting edges.

f. Install new duct section cut from salvaged duct. Secure with screws.

g. Reinstall joiner plates. Install rivets to secure.

h. Paint as necessary.

i. Turn on air conditioner/heater.



CHAPTER 2

PORTABLE TRACING/SCRIBING BOARD

Section I INTRODUCTION

2-1. GENERAL INFORMATION.

2-1.1 Scope.

a. Model Number and Equipment Name. Model 51J3 Portable Tracing/Scribing Board.

b. Purpose of Equipment. To provide illuminated work surface for tracing or scribing.

2-2. EQUIPMENT DESCRIPTION.

2-2.1 Equipment Characteristics, Capabilities, and Features. Provides lightweight, portable, and diffused light source. Used as work surface for tracing or scribing.

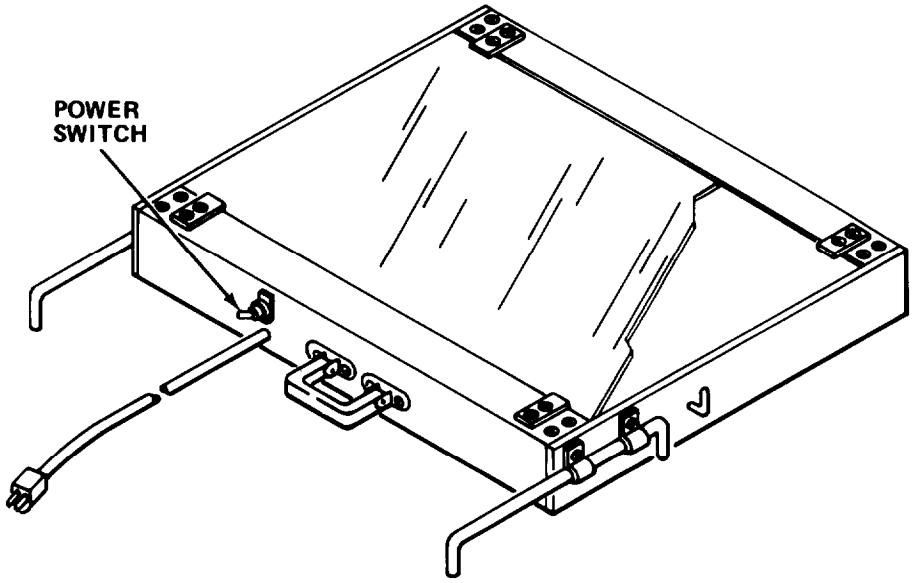
2-2.2 Equipment Data.

Power Requirements	110 V, 60 Hz
Illumination	Two 30W fluorescent lamps
Work Surface	36.0 in. X 23.5 in. (91.4 cm X 59.7 cm)

2-3. TECHNICAL PRINCIPALS OF OPERATION. Principles of Operation. are combined with operator’s controls and indicators for this equipment.

Section II OPERATING INSTRUCTIONS

2-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.



Control or Indicator	Function
POWER SWITCH	Two-position toggle switch to control illumination.

2-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

a. Before You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your before (B) PMCS.

b. While You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your during (D) PMCS.

c. After You Operate. Be sure to perform your after (A) PMCS.

d. If your equipment fails to operate. Troubleshoot with proper equipment. Report any deficiencies using the proper forms. See DA Pam 738-750.

2-5.1 PMCS Procedures.

a. PMCS are designed to keep the equipment in good working condition by performing periodic service tasks.

b. Service intervals provide you, the operator, with time schedules that determine when to perform specified service tasks.

c. The “Equipment is Not Ready/Available If” column is used for identification of conditions that make the equipment not ready/available for readiness reporting purposes or denies use of the equipment until corrective maintenance is performed.

d. If your equipment fails to operate after PMCS is performed, immediately report this condition to your supervisor.

e. Perform weekly as well as before operation if you are the assigned operator and have not operated the item since the last weekly or if you are operating the item for the first time.

f. Item number column. Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your “TM Number" column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording results of PMCS.

g. Interval columns. This column determines the time period designated to perform your PMCS.

h. Item to be inspected and procedures column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation Chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.

i. Equipment is not ready/available if: column. This column indicates the reason or cause why your equipment is not ready/available to perform its primary mission.

j. List of tools and materials required for PMCS is as follows.

Item	Quantity
Cheesecloth (Item 7, Appendix E)	ar

Table 2-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make complete checks and services when the equipment can be shut down.

B- Before
D - During
A - After

W - Weekly
M - Monthly
Q- Quarterly

AN - Annually
S - Semiannually
Bl - Biennially

(Number) - Hundreds of Hours

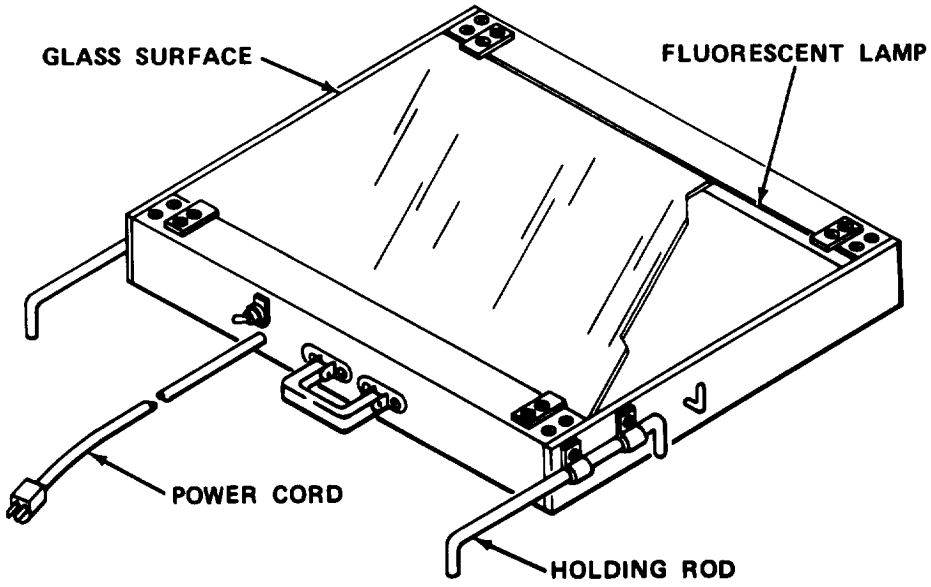
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PORTABLE TRACING/SCRIBING BOARD 	
1	B	Inspect/Clean.	
		WARNING Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.	
		1. Rotate each holding rod to check for freedom of movement.	
		2. Check power cord for kinks, frays, or burns. If power cord is defective, notify organizational maintenance.	Power cord is damaged.
		3. Check fluorescent lamps for partial lighting. Replace as needed (paragraph 2-10.2).	Fluorescent lamp is defective.

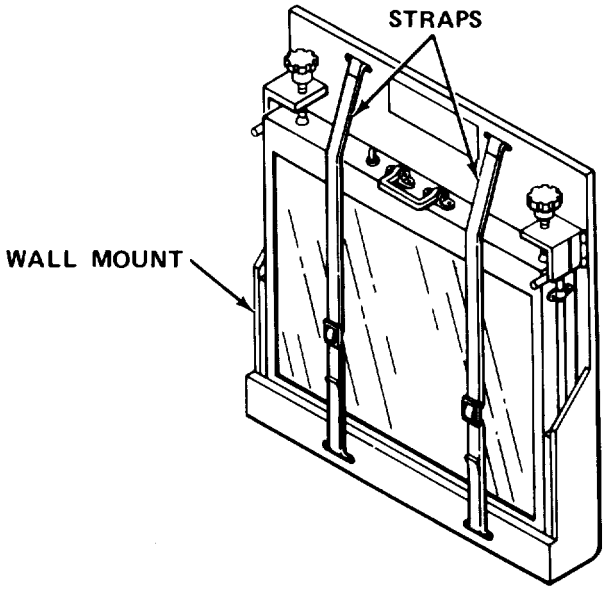
Table 2-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After | W - Weekly M - Monthly Q - Quarterly | AN - Annually S - Semiannually Bl - Biennially | (Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PORTABLE TRACING/SCRIBING BOARD - Cont	
1	B	Inspect/Clean - Cont	
		4. Check glass surface for dust and dirt. Wipe glass surface with moistened cheesecloth. Wipe surface with clean dry cheesecloth to remove smears or streaks. Check glass surface for cracks or scratches. Replace as needed (paragraph 2-10.4).	Glass surface is cracked or scratched.

2-6. OPERATION UNDER USUAL CONDITIONS.

2-6.1 Assembly and Preparation for Use.



a. Remove portable tracing/scribing board from wall mount by loosening straps. Place board on work surface.

b. Plug in power cord and turn power switch ON.

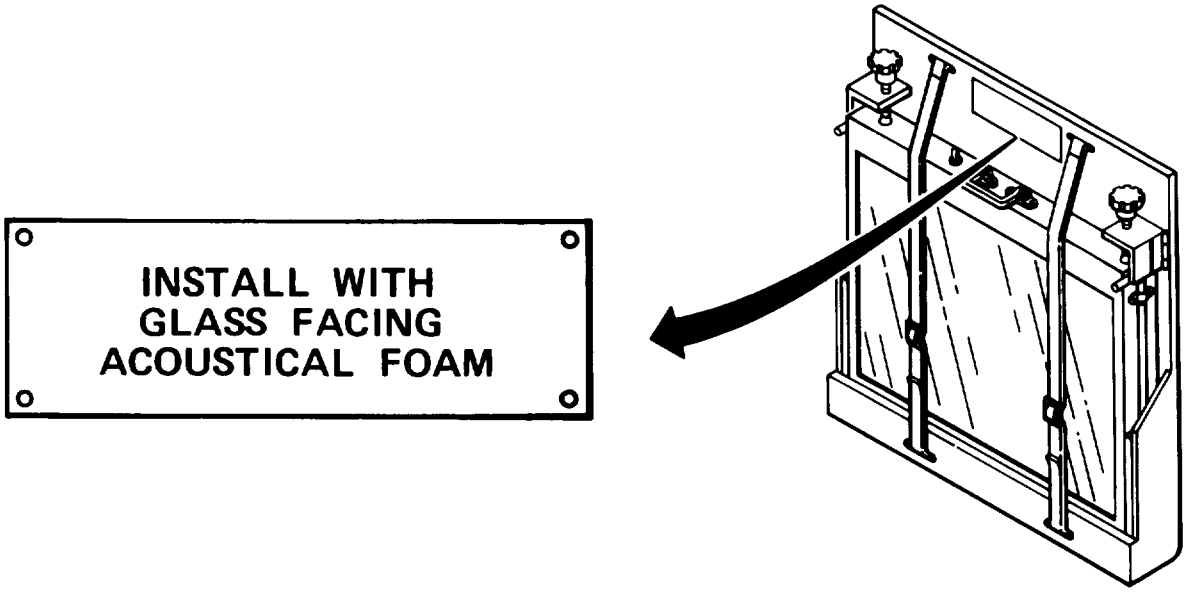
2-6.2 Preparation for Movement.

a. Turn power switch OFF and unplug power cord.

b. Place board in wall mount with glass surface facing padded mount,

c. Secure board in wall mount with straps.

2-6.3 Operating Instructions on Decals and Instruction Plates.



2-7. OPERATION UNDER UNUSUAL CONDITIONS. This equipment is designed for operation only in a controlled environment.

Section III OPERATOR MAINTENANCE

2-8. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

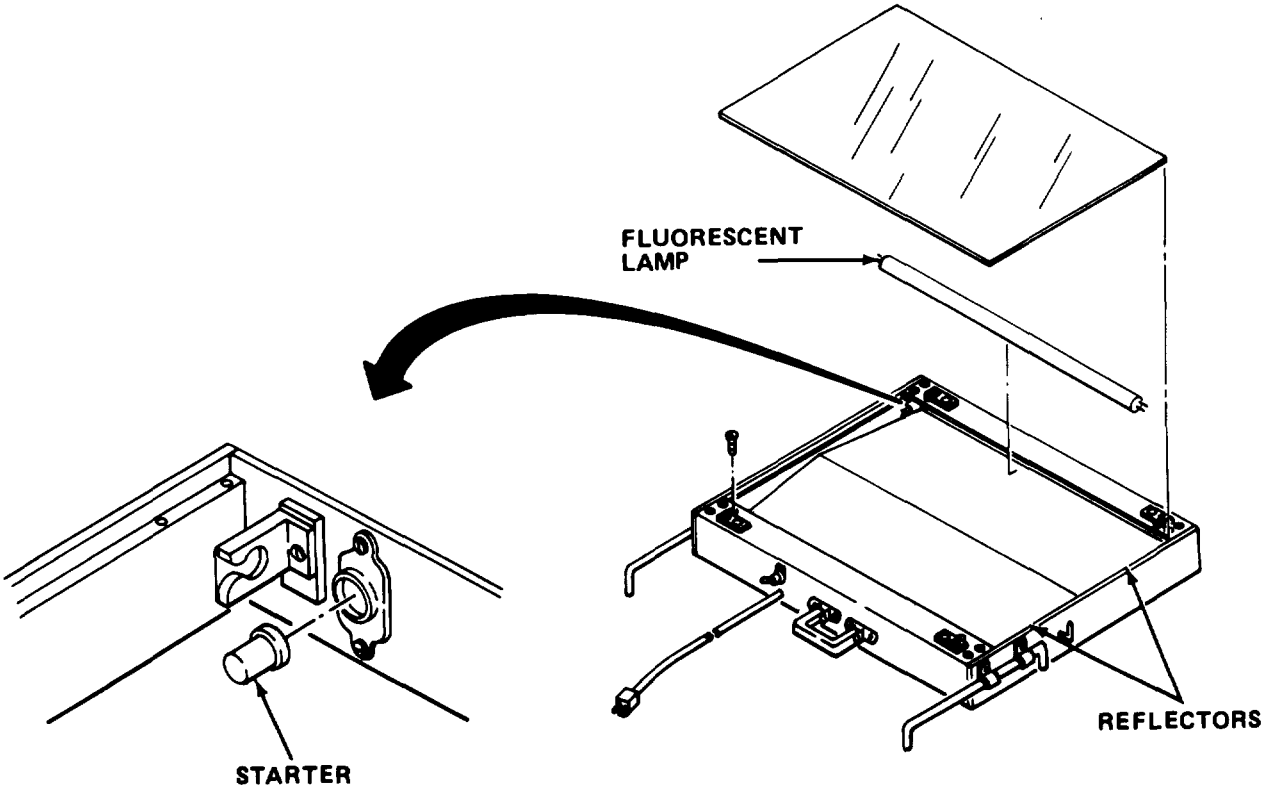
2-9. TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during operation or maintenance of the portable tracing/scribing board, or its components. You should perform the test/inspections and corrective actions in the order listed.

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

Table 2-2. TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
1. ILLUMINATION UNEVEN.	



WARNING

Use care when power is connected during inspections or corrective actions. Death or serious injury may result.

Step 1. Check to see if reflector behind fluorescent lamps is dirty.

Clean reflector (paragraph 2-10.1).

Table 2-2. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
1. ILLUMINATION UNEVEN - Cont	
Step 2. Check to see if one fluorescent lamp is partially lighted or is dark.	Replace fluorescent lamp (paragraph 2-10.2).
Step 3. Check to see if either fluorescent lamp is partially lighted.	Replace defective starter (paragraph 2-10.3).

2-10. MAINTENANCE PROCEDURES.

a. This section contains instructions covering operator maintenance functions for the portable tracing/scribing board. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

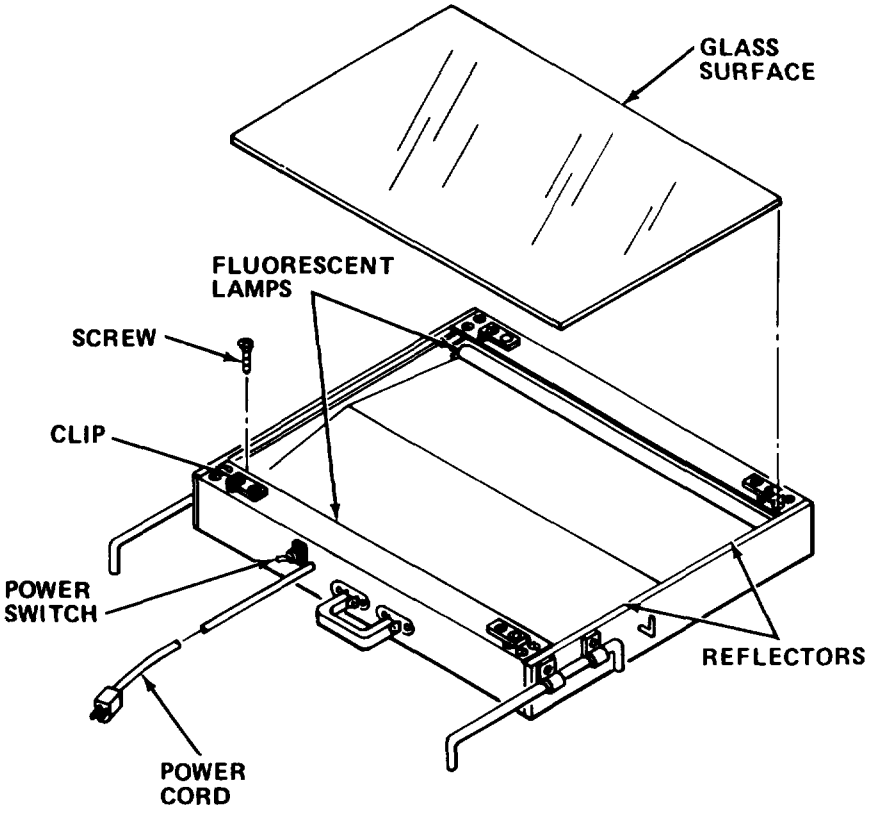
INDEX

2-10.1 Clean Reflector.

MOS: 81Q, Terrain Analyst

TOOLS: Cross Tip Screwdriver
Vacuum Cleaner

SUPPLIES: Cheesecloth (Item 7, Appendix E)



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch OFF and unplug power cord.

b. Remove one screw from each of four clips. Loosen other screws.

c. Turn clips 90° to right or left.

CAUTION

Glass surface must be handled with care to avoid chipping or breaking.

d. Remove glass surface.

e. Vacuum reflector surface and fluorescent lamps with brush attachment on vacuum cleaner.

NOTE

Be sure fluorescent lamps are secure in their sockets.

f. Wipe reflector and lamps with moistened cheesecloth.

gg. Wipe or vacuum both sides of glass surface.

h. Reinstall glass surface.

i. Turn clips to secure glass surface. Aline holes and reinstall screws. Tighten all screws.

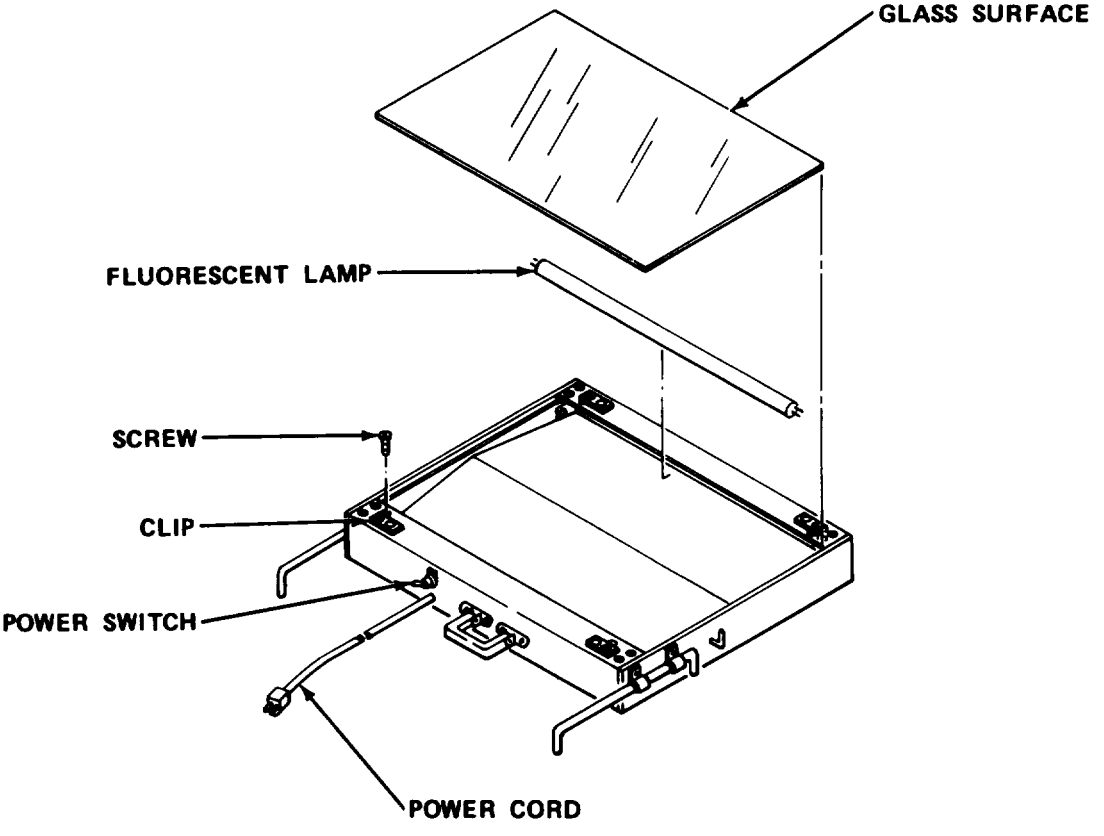
j. Plug in power cord and turn power switch ON.

2-10.2 Replace Fluorescent Lamp

MOS: 81Q, Terrain Analyst

TOOLS: Cross Tip Screwdriver

SUPPLIES: Fluorescent Lamp (30 W)



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch OFF and unplug power cord.

b. Remove one screw from each of four clips. Loosen other screws.

c. Turn clips 90° to right or left.

CAUTION

Glass surface must be handled with care to avoid chipping or breaking.

d. Remove glass surface.

e. Remove defective fluorescent lamp.

f. Install new fluorescent lamp.

g. Reinstall glass surface.

h. Turn clips to secure glass surface. Aline holes and reinstall screws. Tighten all screws.

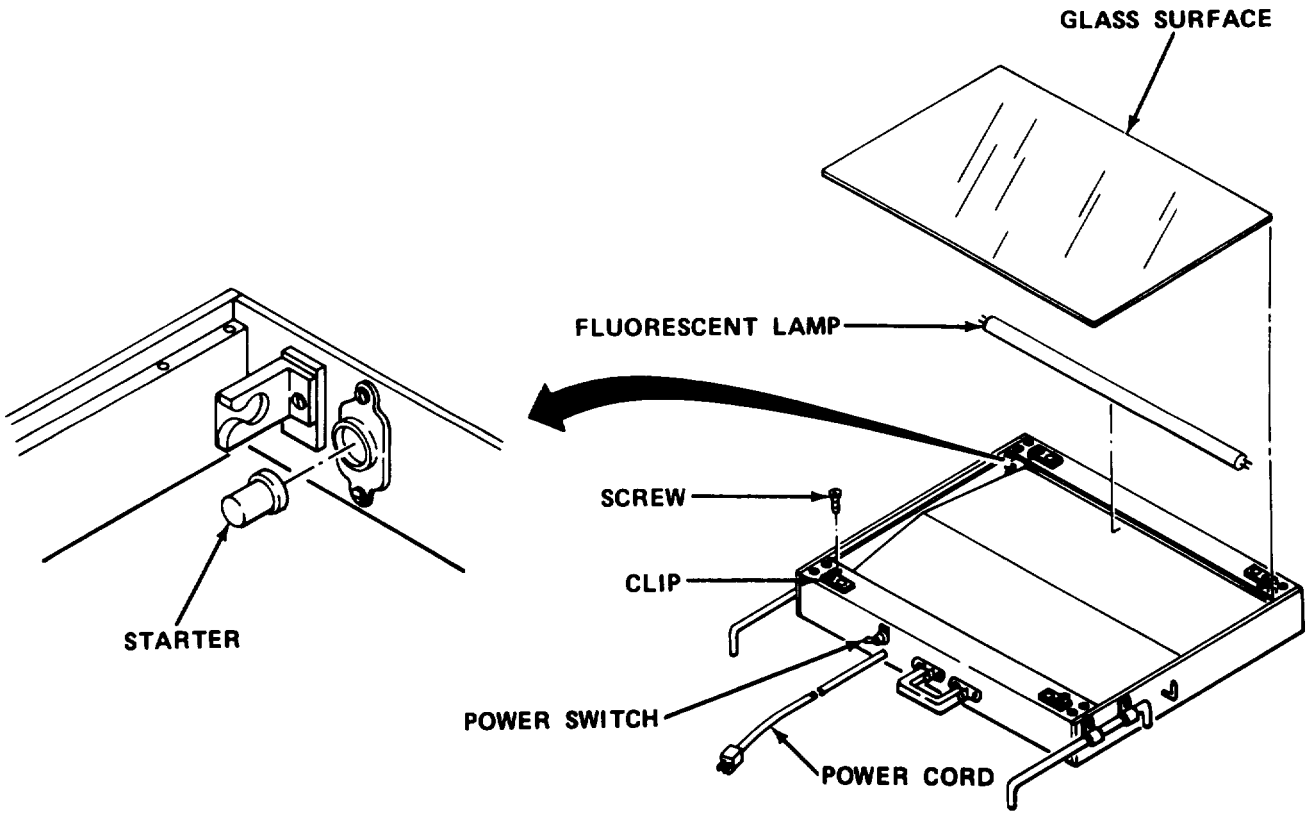
i. Plug in power cord and turn power switch ON.

2-10.4 Replace Glass Surface.

MOS: 81Q, Terrain Analyst

TOOLS: Cross Tip Screwdriver

SUPPLIES: Glass Surface



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch OFF and unplug power cord.

b. Remove one screw from each of four clips. Loosen other screws.

c. Turn clips 90° to right or left.

CAUTION

Glass surface must be handled with care to avoid chipping or breaking.

d. Remove glass surface.

e. Remove fluorescent lamp in front of starter.

f. Remove starter by pushing in and turning left until free.

g. Install new starter in socket by pushing in and turning right until locked.

h. Reinstall fluorescent lamp.

i. Reinstall glass surface.

j. Turn clips to secure glass surface. Aline holes and reinstall screws. Tighten all screws.

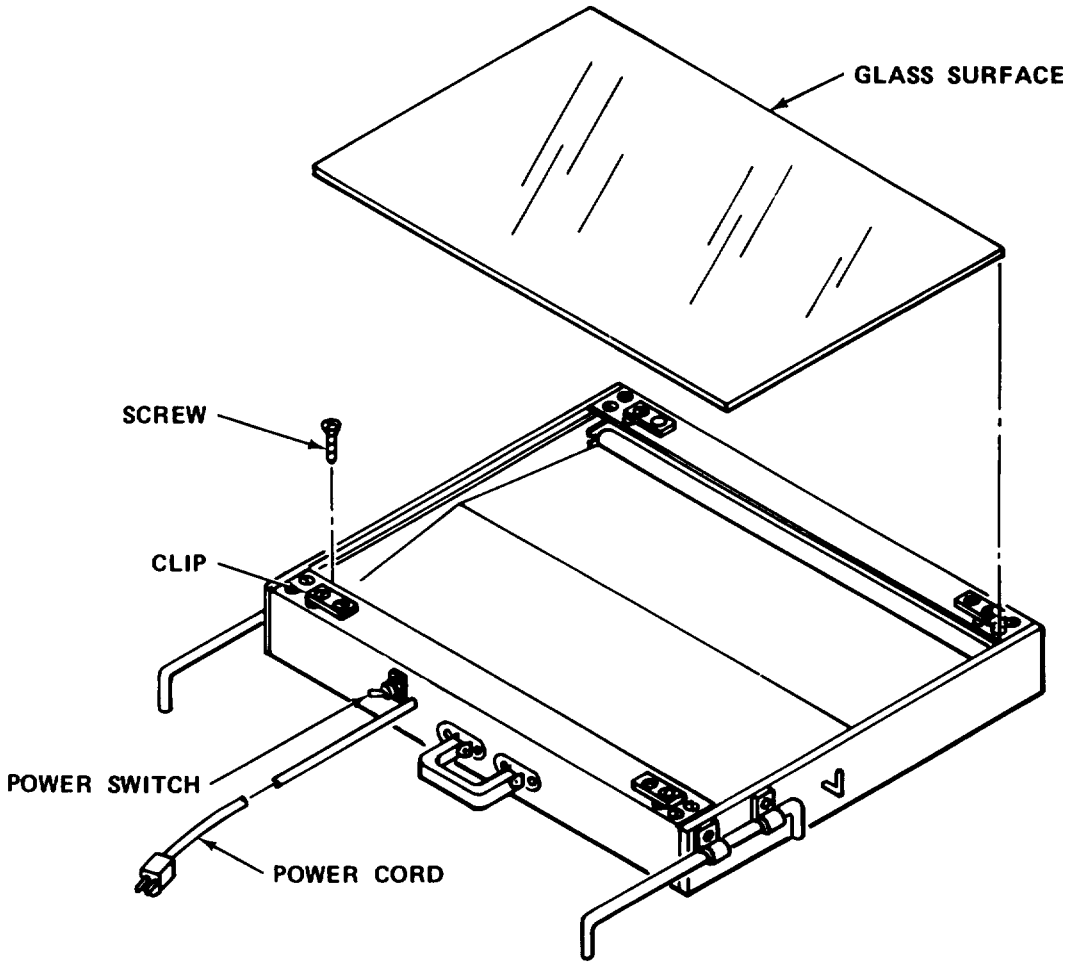
k. Plug in power cord and turn power switch ON.

2-10.3 Replace Starter.

MOS: 81Q, Terrain Analyst

TOOLS: Cross Tip Screwdriver

SUPPLIES: Starter



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch OFF and unplug power cord.

b. Remove one screw from each of four clips. Loosen other screws.

c. Turn clips 90° to left or right.

WARNING

Use care when handling damaged glass. Failure to do so may result in serious cuts.

d. Remove damaged glass surface.

CAUTION

Glass surface must be handled with care to avoid chipping or breaking.

e. Install new glass surface.

f. Turn clips to secure glass surface. Aline holes and reinstall screws. Tighten all screws.

g. Plug in power cord and turn power switch ON.

Section IV ORGANIZATIONAL MAINTENANCE

2-11. LUBRICATION INSTRUCTIONS . This equipment does not require lubrication.

2-12. REPAIR PARTS. SPECIAL TOOLS: TEST. MEASUREMENT. AND DIAGNOSTIC EQUIPMENT (TMDE) ; AND SUPPORT EQUIPMENT.

2-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

2-12.2 Special Tools; Test, Measurement. and Diagnostic Equipment; and Support Equipment. Special Tools, TMDE, and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.

2-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-6675-324-24P covering organizational maintenance for this equipment.

2-13. SERVICE UPON RECEIPT.

2-13.1 Checking Unpacked Equipment.

a. Inspect the equipment for damage incurred during shipment. If equipment has been damaged, report the damage on DD Form 6, Packing Improvement Report.

b. Check the equipment against the packing list to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

c. Check to see whether the equipment has been modified.

2-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES. There are no organizational PMCS procedures assigned for this equipment.

2-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES. There are no organizational troubleshooting procedures assigned for this equipment.

2-16. ORGANIZATIONAL MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the portable tracing/scribing board. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

NOTE

The maintenance procedures for the portable tracing/scribing board consist of replacing three different electrical components. A multimeter is needed to determine which component is defective and needs replacement.

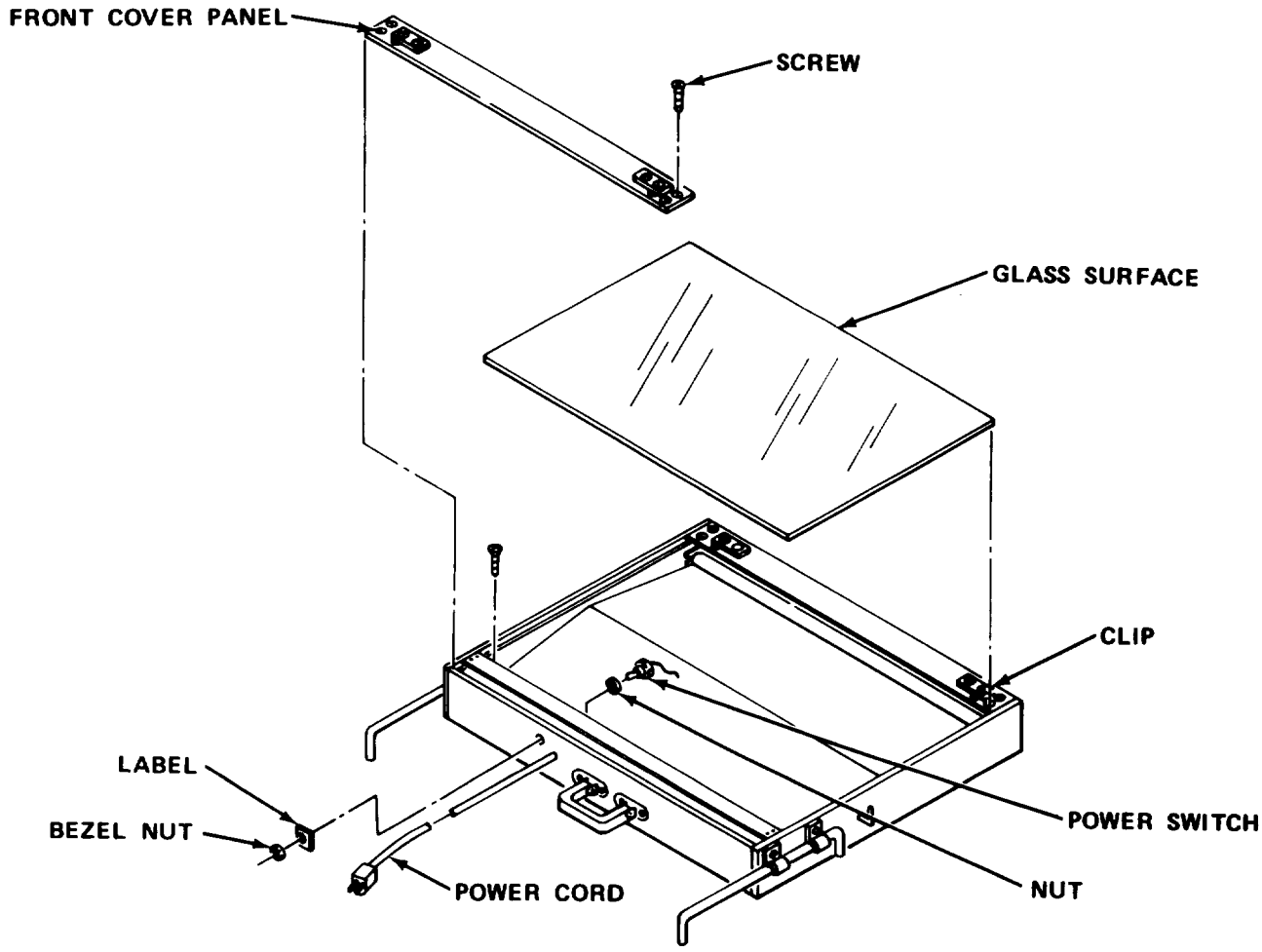
INDEX

2-16.1 Replace Power Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS : Cross Tip Screwdriver
Flat Tip Screwdriver
6 in. Adjustable Wrench

SUPPLIES: Power Switch



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch OFF and unplug power cord.

b. Remove one screw from each of four clips. Loosen other screws.

c. Turn clips 90° to left or right.

CAUTION

Glass surface must be handled with care to avoid chipping or breaking.

d. Remove glass surface and set aside.

e. Remove screws and front cover panel.

f. Remove bezel nut, label, and nut from power switch.

NOTE

Ground wire is not connected to switch. Mark position for reinstallation.

g. To remove defective power switch, pull to inside of board. Tag and disconnect wires.

h. Remove defective switch.

i. Connect wiring to new power switch and remove tags.

j. Reinstall nut, label, and bezel nut. Adjust for proper positioning of power switch.

k. Reinstall front cover panel and secure with screws.

l. Reinstall glass surface.

m. Turn clips 90° to secure glass surface.

n. Reinstall screws on clips. Tighten all screws.

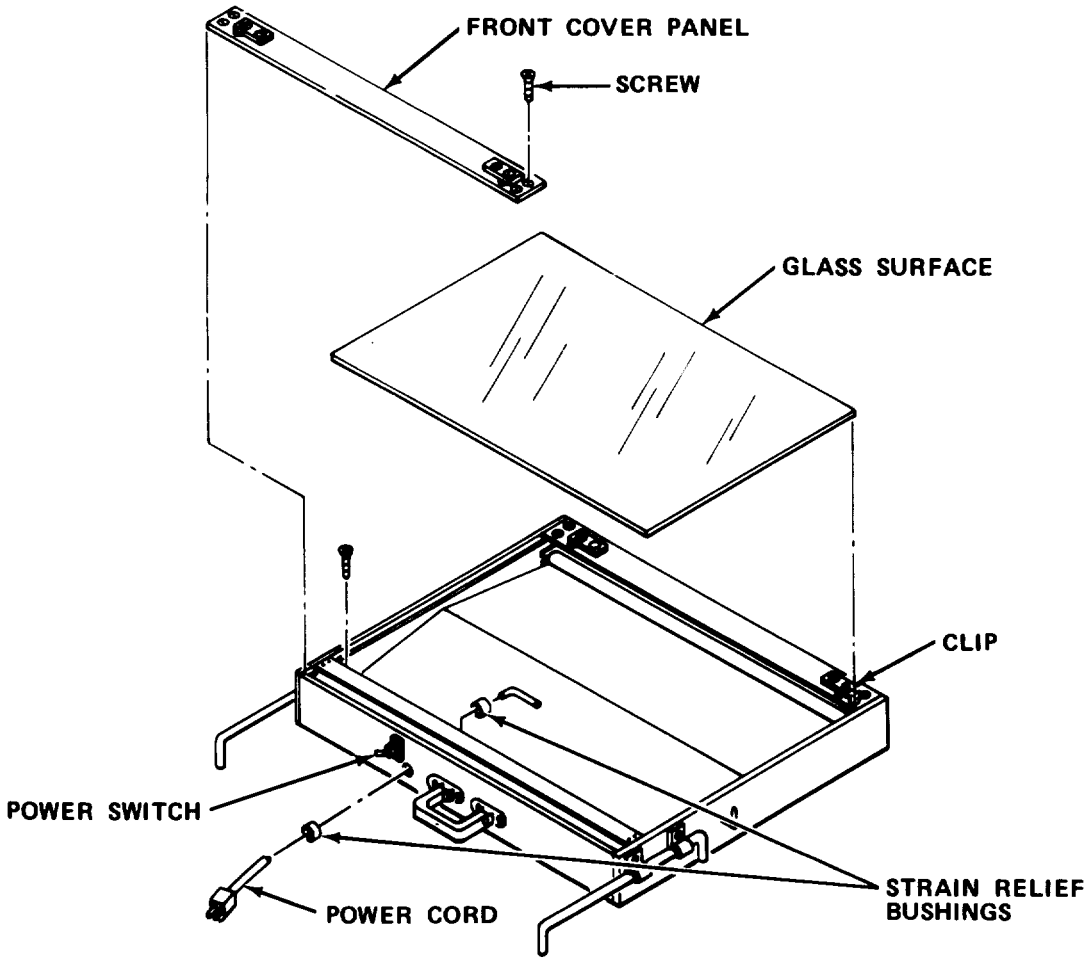
o. Plug in power cord and turn power switch ON.

2-16.2 Replace Power Cord.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS : Cross Tip Screwdriver
Needle Nose Pliers

SUPPLIES: Power Cord



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch OFF and unplug power cord.

b. Remove one screw from each of four clips. Loosen other screws.

c. Turn clips 90° to left or right.

CAUTION

Glass surface must be handled with care to avoid chipping or breaking.

d. Remove glass surface and set aside.

e. Remove screws and front cover panel.

f. Tag and disconnect wires to remove defective power cord.

g. Remove inner and outer strain relief bushings and remove defective power cord.

h. Reinstall inner and outer strain relief bushings on new power cord.

i. To install, connect wires to power cord, and remove tags.

j. Reinstall front cover panel and secure with screws.

k. Reinstall glass surface.

l. Turn clips 90° to secure glass surface.

m. Reinstall screws on clips. Tighten all screws.

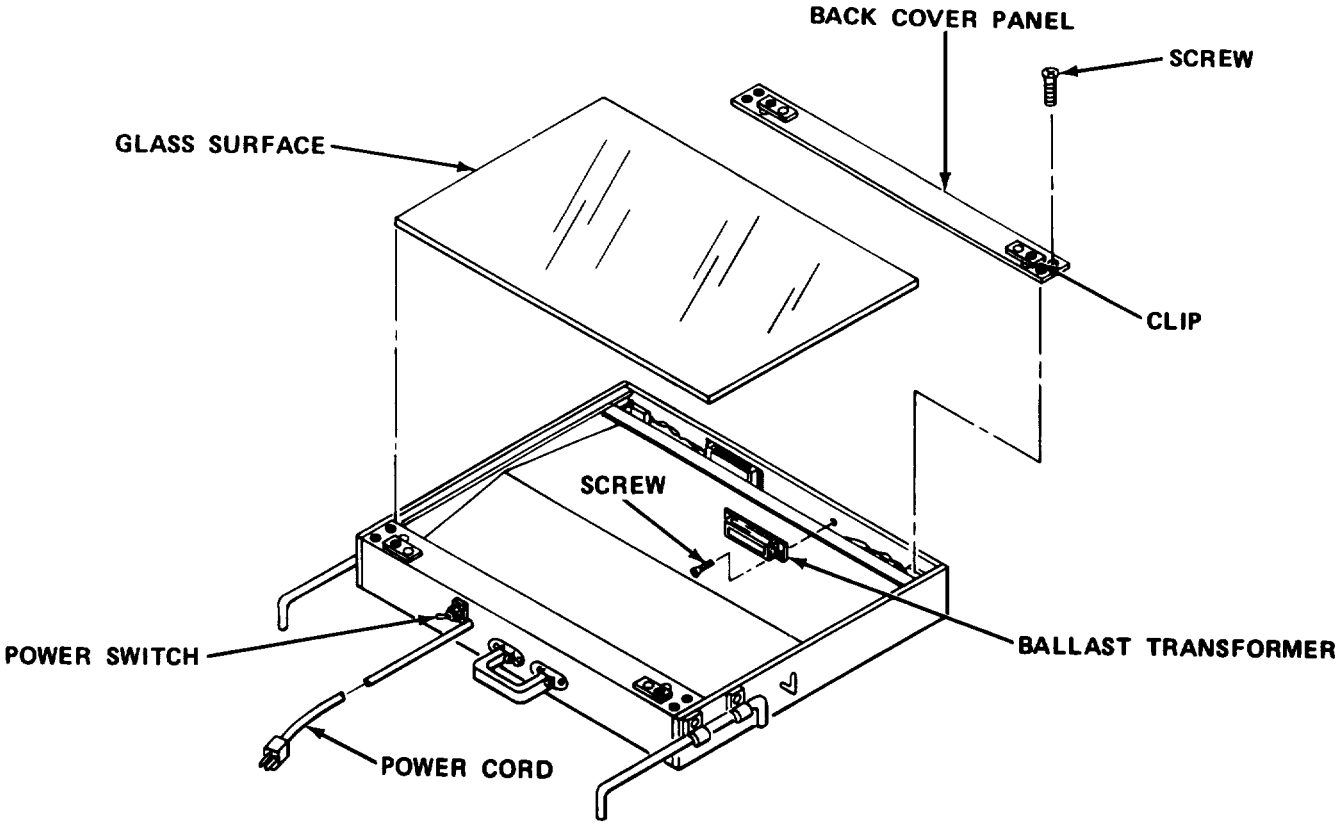
n. Plug in power cord and turn power switch ON.

2-16.3 Replace Ballast Transformer.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Cross Tip Screwdriver

SUPPLIES: Ballast Transformer



WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch OFF and unplug power cord.

b. Remove one screw from each of four clips. Loosen other screws.

c. Turn clips 90° to left or right.

CAUTION

Glass surface must be handled with care to avoid chipping or breaking.

d. Remove glass surface and set aside.

e. Remove screws and back cover panel.

f. Remove screws and defective ballast transformer.

g. Disconnect and tag wires from ballast transformer.

h. Connect wiring on new ballast transformer and remove tags.

i. Install new ballast transformer and secure with screws.

j. Reinstall back cover panel and secure with screws.

k. Reinstall glass surface.

1. Turn clips 90° to secure glass surface.

m. Reinstall screws on clips. Tighten all screws.

n. Plug in power cord, and turn power switch ON.

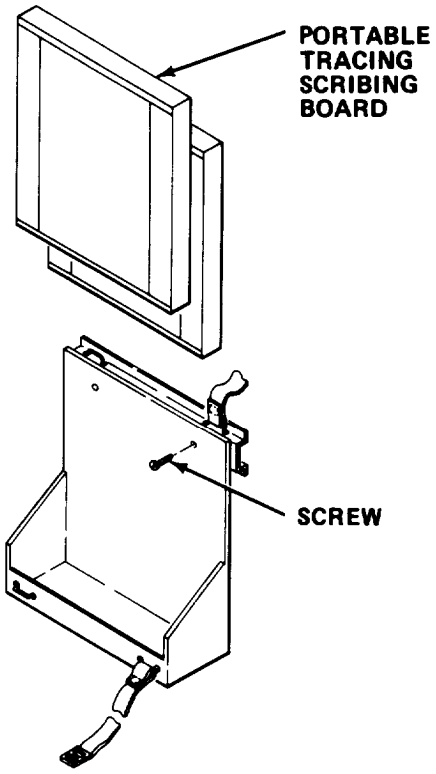
2-16.4 Remove/Install Mounting Bracket,

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS : 1/4 in. Socket Set
Cross Tip Screwdriver

SUPPLIES: Mounting Bracket

a. Remove portable tracing/scribing board from mounting bracket.



b. Remove attaching hardware securing defective mounting bracket to wall.

c. Remove attaching hardware securing defective mounting bracket to floor.

d. Remove defective mounting bracket.

e. Secure new mounting bracket to wall with attaching hardware.

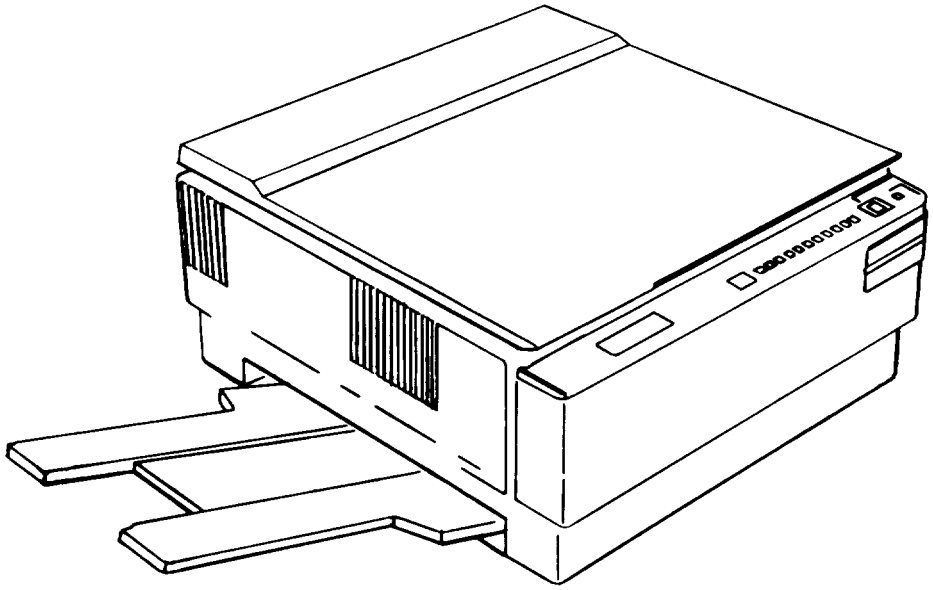
f. Secure new mounting bracket to floor with attaching hardware.

g. Reinstall portable tracing/scribing board.

2-17. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

There are no direct/general support maintenance procedures assigned for this equipment.



CHAPTER 3

PLAIN PAPER COPIER

Section I INTRODUCTION

3-1. GENERAL INFORMATION.

3-1.1 Scope.

a. Model Number and Equipment Name. Model NP-200 Desk-Top Plain Paper Copier.

b. Purpose of Equipment. To make copies on letterheads, transparencies, colored paper, labels, ledger ruled paper, post cards, and computer printouts.

3-1.2 Reference Information.

a. List of Abbreviations.

BSSD	Blank Exposure Shutter Solenoid
CBFW	Copyboard Forward
CBHP	Copyboard Home Position
CBRV	Copyboard Reverse
CBSP	Copyboard Start Position
CCNTI	Control Counter Installed
CdS	Cadmium Sulfide
CLA1	Cassette Lamp 1
CLKP	Clock Pulse
CNTOP	Counter Open
COVF	Cleaner Overflow
CPU	Central Processing Unit
CPUSD	Cassette Pickup Solenoid Drive
DD1	Digital Display 1
DD2	Digital Display 2

DRMD	Drum Drive
DSPA	Display A
DSPB	Display B
DSPC	Display C
DSPD	Display D
ETFS	Extension Timer For Shut-off
EXP1	Exposure Control Lever at 1
EXP9	Exposure Control Lever at 9
EXPAJ	Exposure Control
HPRGP	Copyboard Home Position or Registration Pulse
IEXP	Scanning Lamp Drive
INTR	Initial Rotation
I/0 Port	Input/Output Port
JAM	Jam Command
JAM I	Jam Indication
JAMRD	Jam Relay Drive
JRST1	Jam Reset 1
JRST2	Jam Reset 2
K1	Key 1
K2	Key 2
K3	Key 3
K4	Key 4
KS1	Key Scan 1
KS2	Key Scan 2
KS3	Key Scan 3

KS4	Key Scan 4
KYBZ	Keypad Buzzer Drive
LCNTD	Large Copy Counter Drive
LINT	Light Intensity Control
LINTT	Light Intensity Control Timer
LSTR	Last Rotation
MPUSD	Manual Pickup Solenoid Drive
MS4	Microswitch 4
MS5	Microswitch 5
OSC	Oscillator Output
PCEL	Paper/Cassette Out Lamp
PDP1	Paper Detection Pulse 1
PDP2	Paper Detection Pulse 2
PDP3	Paper Detection Pulse 3
PEP	Paper Empty
PFP	Paper Feed
POWER	Wait and Power
PT	Pulse Transformer
PUT	Programmable Unijunction Transistor
RAM	Random Access Memory
RGP	Registration Pulse
RGSD	Registration Solenoid Drive
RMH1	Remote HV 1
RMH2	Remote HV 2
RMH2H	Remote HV 2 Strong

RMH2L	Remote HV 2 Weak
ROM	Read Only Memory
SCNTD	Small Copy Counter Drive
SIEXP	Strong Image Exposure
SOFF	Auto Shutoff
TCNTD	Total Copy Counter Drive
TEP	Developer Hopper Empty Pulse
TEOFL	Developer Hopper Empty or Overflow Lamp Drive
TEOFP	Developer Empty or Overflow Pulse
WAIT	Wait Signal
WTCTO	Wait or Counter Open

b. Glossary.

Compensation	To make Up for what is excessive or deficient.
Corona	Faint glow adjacent to surface of electrical conductor at high voltage.
Fog	Gray or black background in white area of copy.
Lead Edge	First edge to come out of copier.
Microcomputer	Complete, small computing system consisting of hardware and software.
Micron . . . . . , .	Unit of length equal to one-millionth of a meter,
Ozone.	Form of oxygen that is a bluish, irritating gas of pungent odor and is formed naturally in upper atmosphere or is generated by an electrical discharge of high potential in air.

Photosensitive	Responds readily to action of radiant energy.
Precondition	To put in proper or desired state.
Registration	Accurate Positioning of copy paper.
Resistivity	Axial electrical resistance of a uniform rod of unit length and unit cross-sectional area: Reciprocal of conductivity.
Sensitivity	Capacity of a device to respond to stimulation.
Skew	Change from straight line.

3-2. EQUIPMENT DESCRIPTION.

3-2.1 Equipment Characteristics, Capabilities, and Features.

a. Manual or cassette paper feed.

b. High speed copying.

C. Automatic shutoff.

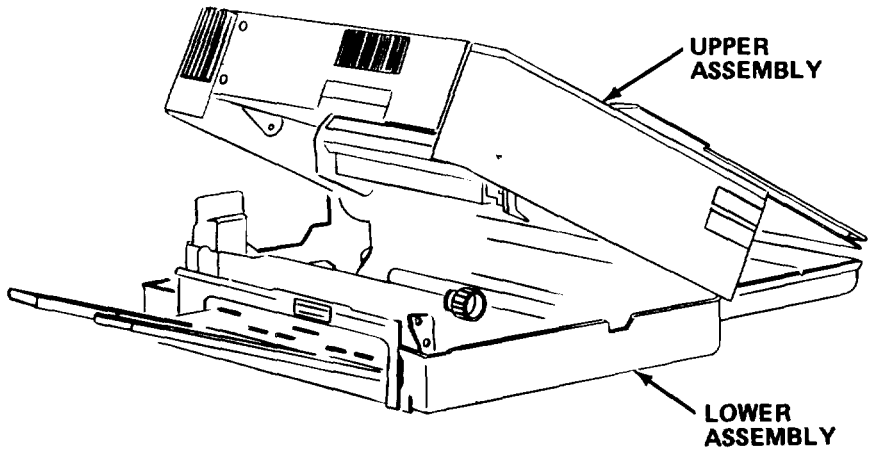
d. Microcomputer control.

e. Single-component developer.

f. Ozone protection.

g. Multi-size copying.

3-2.2 Location and Description of Major Components.



UPPER ASSEMBLY. Houses copyboard, control panel, fiber optic lens, halogen lamp, high voltage transformer, manual feed guide, developer hopper, and corona assembly.

LOWER ASSEMBLY. Houses exhaust fans, printed circuit boards, cassette feed guides, reproduction delivery area, and photosensitive drum.

3-2.3 Equipment Data.

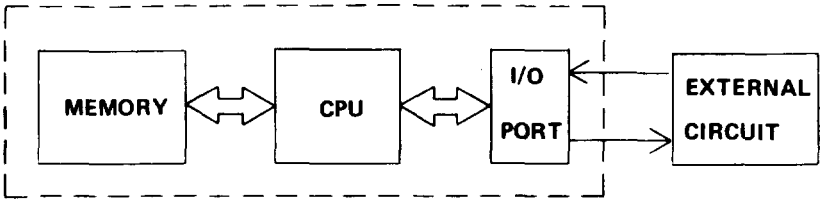
Power Requirements	120 V, 60 Hz, 15 amp
Power Consumption	
Maximum	1.1 kVA
Standby	0.2 kVA
Dimensions	20.25 in. X 21.25 in. X 11.4 in. (51.6 cm x 54.0 cm X 28.9 cm)
Weight	134 lbs (61 kg)
Magnification	1:1
Warm Up Time	3 min
Maximum Paper Size	11.7 in. X 17.0 in. (29.7 cm X 43.2 cm)
Cassette Paper Capacity	250 Sheets
Copy Tray Capacity	Approximately 100 Sheets
First Copy Time	8 sec

3-3. TECHNICAL PRINCIPLES OF OPERATION.

3-3.1 General. All electrical control functions of the copier are performed by a microcomputer. The microcomputer controls copying operations by reading input sensor signals and outputting commands according to a built-in program. These commands cause the motor and solenoids to operate and amplify low level microcomputer outputs to control the high power loads of the motor. The control system consists of:

Microcomputer (a)
Drivers (b)
Operating Loads (c)
Reading of Input Sensors/Commands (d)

a. Microcomputer.

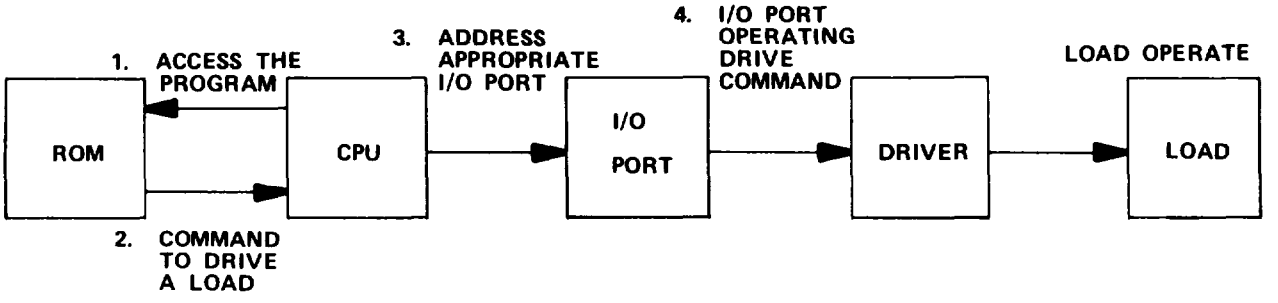


The microcomputer consists of a ROM, a CPU, and an I/0 port. These are incorporated into a single chip of silicon which is called a single chip microcomputer. It is a four-bit type. Four-bit refers to the four lines of digital information with which it operates. The CPU is the center of operations and the control mechanism of a microcomputer. It is also called a microprocessor. It controls all copy operations by monitoring the progress of the copy process and commanding subsequent operations according to a program in the memory unit. The CPU has an internal 250 kHz clock that controls its sequence of operations. The memory stores data in electronic form. The microcomputer operates with binary digital logic. The binary digital numbers are used to command operations, signal conditions within the copier and to keep a record of data. Data is read into memory by a WRITE operation and taken out by READ. The copier employs two types of memory units: ROM and RAM. ROM is programmed at the time of manufacturing. The microprocessor reads its contents for step-by-step instructions for operating every electrical and mechanical part. The microprocessor knows from the program in the ROM when it should wait for input signals from sensors. The contents of the ROM are not changed by normal operations. Loss of power does not affect its contents.

The RAM unit is used for temporary storage (read and write) of information that varies during copying operations. Data is retained only as long as needed, then erased. All contents in RAM are lost when power is secured. Both memories are controlled by externally generated clock pulses. The I/0 port is the device used for input and output of all data between the microcomputer and external circuits according to the program operating the microprocessor. All data signals to and from the microcomputer pass through it.

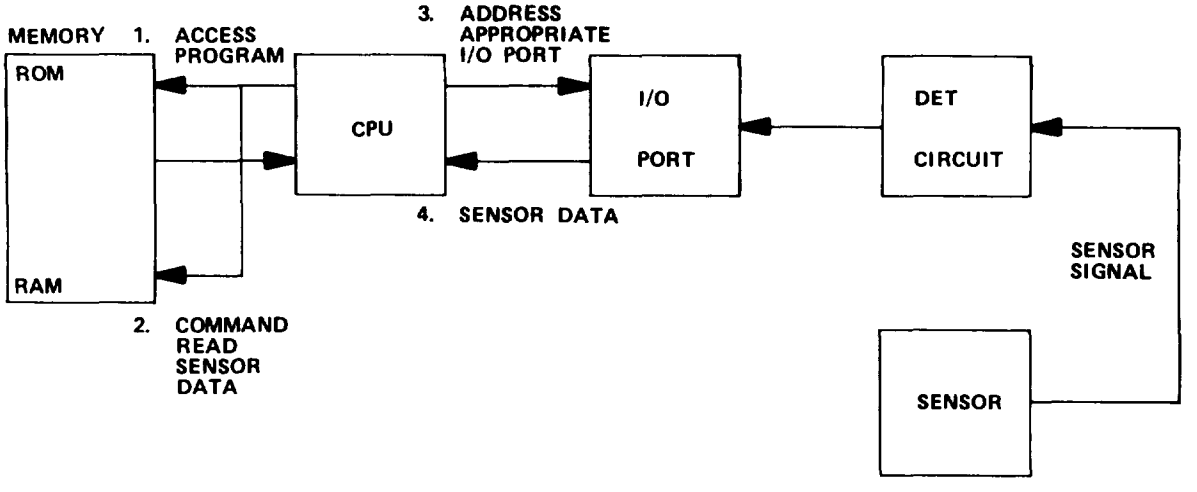
b. Drivers. Inverting amplifiers are used to amplify the low level micro-computer outputs to control high power loads, such as motors.

c. Operating Loads.



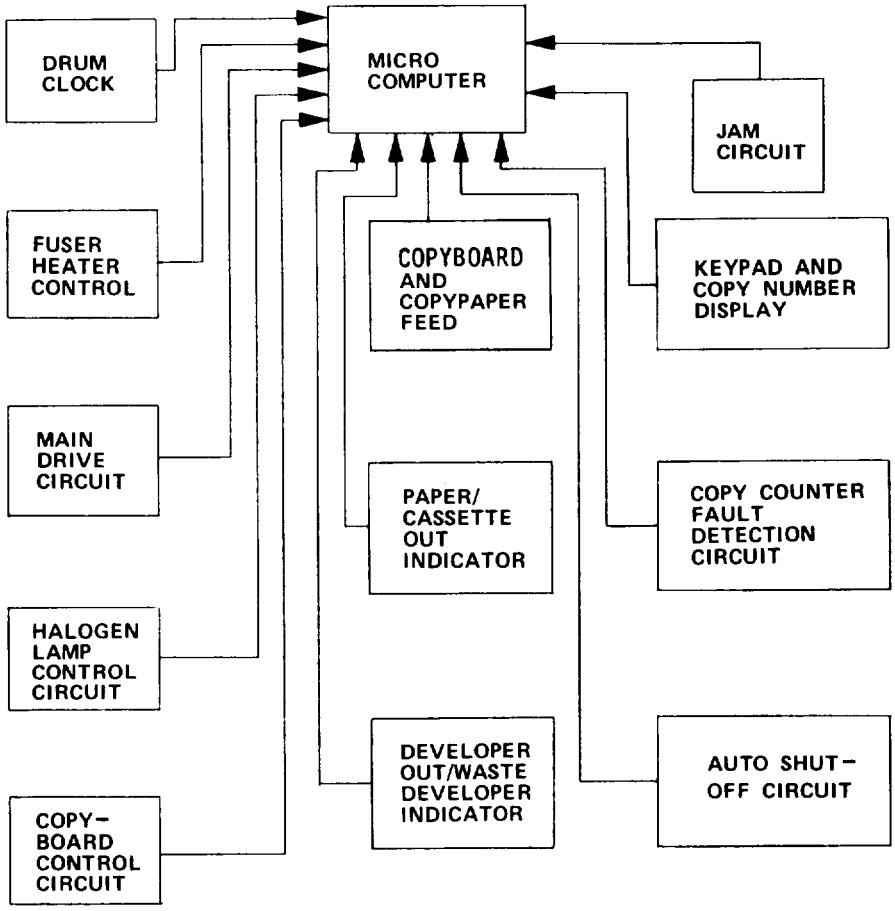
First the CPU reads the program in ROM. ROM outputs a command to drive a load to the CPU. The CPU addresses the appropriate I/0 port. The I/0 port passes the drive command to the driver which amplifies the command and drives the load.

d. Reading of Input Sensors/Commands.

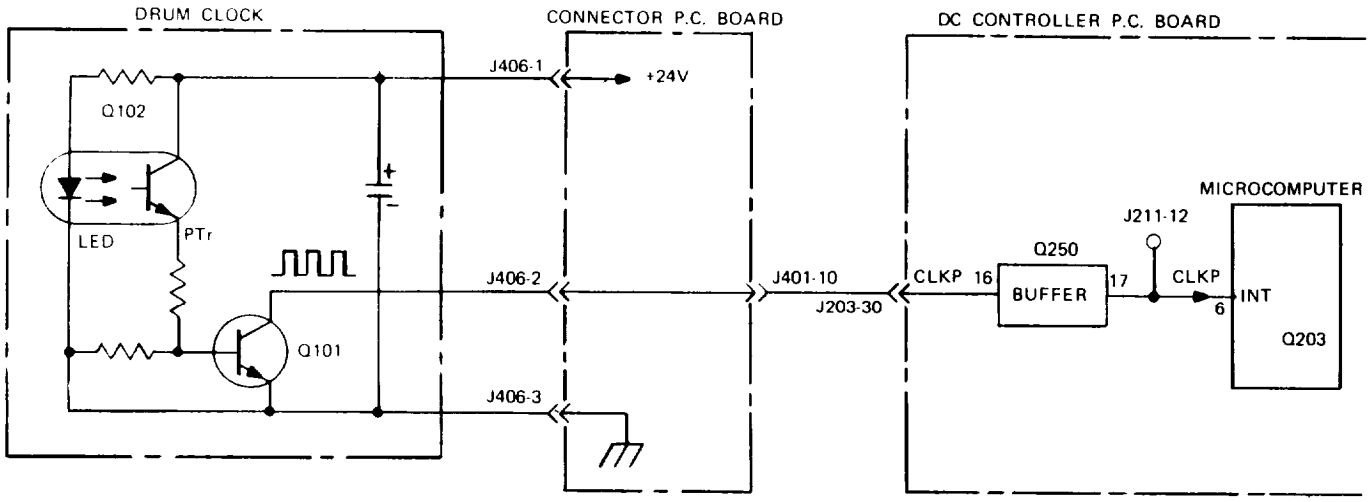


To be sure that the command is being conducted, a feedback loop is employed. A sensor outputs a sensor signal through the sensor detection I/0 port and CPU. The CPU will address the program in the RAM or ROM. The RAM or ROM will then output a command to either continue or stop the action to the CPU. The CPU will address the appropriate I/0 port to obey the command.

3-3.2 Detailed Control System. Consists of the following components:

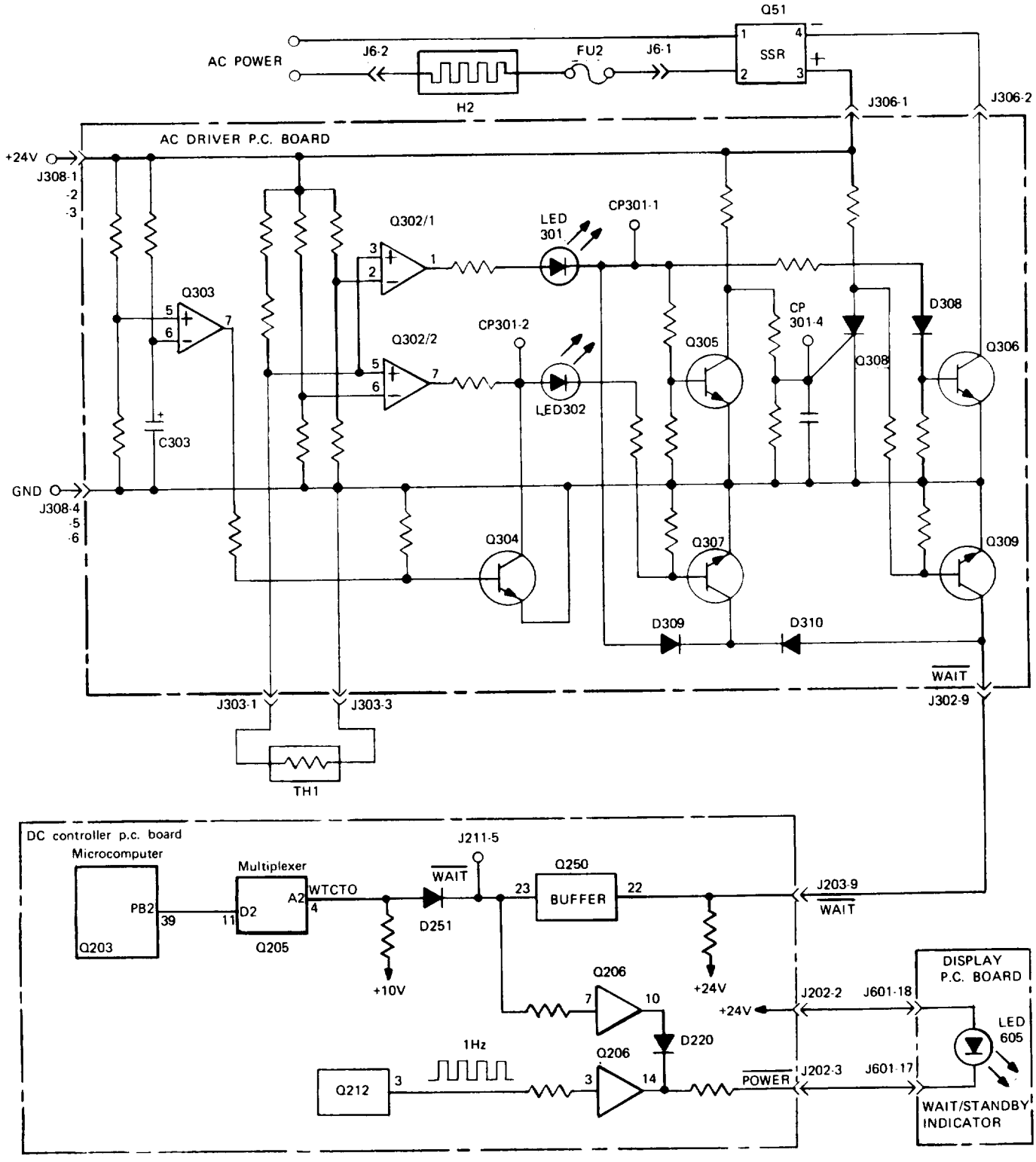


Drum Clock (a)
Fuser Heater Control (b)
Main Drive Circuit (c)
Halogen Lamp Control Circuit (d)
Copyboard Control Circuit (e)
Platen and Copy Paper Feed (f)
Jam Circuit (g)
PAPER/CASSETTE OUT Indicator (h)
Developer OUT/WASTE Developer Indicator Circuit (i)
Keypad and Copy Number Display (j)
Copy Counter Fault Detection Circuit (k)
Auto Shutoff Circuit (l)
Power Circuits (m)
Optical System (n)

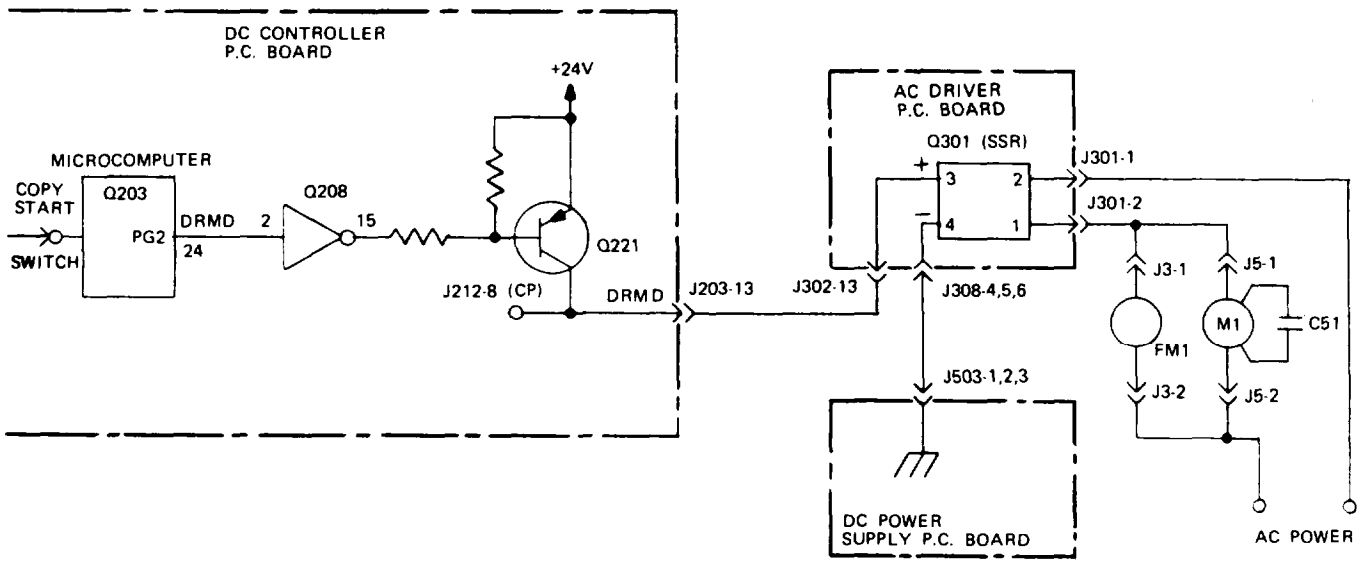


a. Drum clock. The microcomputer times the various operations by counting the clock pulses generated when a rotating, toothed wheel passes through a photo-interrupter. The toothed wheel is driven by a gear on the shaft of the photosensitive drum and generates 175 clock pulses per drum rotation.

b. Fuser heater control. Switching the power on causes the fixing roller heater to switch on and WAIT/STANDBY indicator to flash. This condition is called the wait period. The surface temperature of the fixing rollers is measured by thermistor TH1, which has a negative temperature coefficient. Its resistance is measured by comparator Q302, which controls solid-state relay Q51 which switches power to heater H2 on and off. If the surface temperature of the fixing roller is below 356°F (180°C), the following events occur: Q302-1 = 1 (high) and LED301, Q306, Q51, and H2 are on. In addition, LED301 turns on Q305, which causes Q308 output to be high, thus causing Q309, Q250-23, Q205-4, and Q203-39 to read zero (low), preventing copying action from taking place. WAIT/STANDBY indicator LED605 flashes due to Q206-7 output being high and the pulsed 1 Hz output of Q212-3. When the surface temperature of the fixing roller is above 356°F (180°C), the exact opposite action occurs. LED605 no longer flashes, the input to the microcomputer is high, and copies can be made. At normal room temperature, the resistance of the thermistor is high. This would activate the Failure Detection circuit and make Q302-7 output high. The purpose of the 1 Hz timer circuit is to cause Q302-7 output to be low for 30 sec until the thermistor resistance decreases as the roller heats up. When power is first applied, C303 starts charging. Q303-7 output is high, causing Q304 output to be low. After 30 see, Q303-7 output goes low, turning Q304 off, and Q302-7 output is high. If, after this period, the thermistor fails, Q302-7 output is kept high, causing LED302 to light, turning Q307 on, Q306, Q51, and the heater off, and the input to Q203-39 is low. No copies can be made and the WAIT/STANDBY indicator flashes.


AC POWER
J6-2
H2
FU2
J6-1
Q51
SSR
J306-1
J306-2
AC DRIVER P.C. BOARD
+24V
J308-1
-2
-3
GND
J308-4
-5
-6
Q303
C303
Q302/1
Q302/2
LED 301
CP301-1
CP301-2
LED302
Q305
CP 301-4
Q308
D308
Q306
Q304
Q307
Q309
D309
D310
WAIT
J302-9
J303-1
J303-3
TH1
DC controller p.c. board
Microcomputer
PB2
39
Q203
Multiplexer
D2
11
A2
4
Q205
WTCTO
J211-5
WAIT
D251
+10V
Q250
BUFFER
23
22
J203-9
WAIT
Q206
7
10
+24V
+24V
D220
1Hz
Q212
3
Q206
3
14
POWER
J202-2
J601-18
J202-3
J601-17
DISPLAY P.C. BOARD
LED 605
WAIT/STANDBY INDICATOR

c. Main drive circuit.

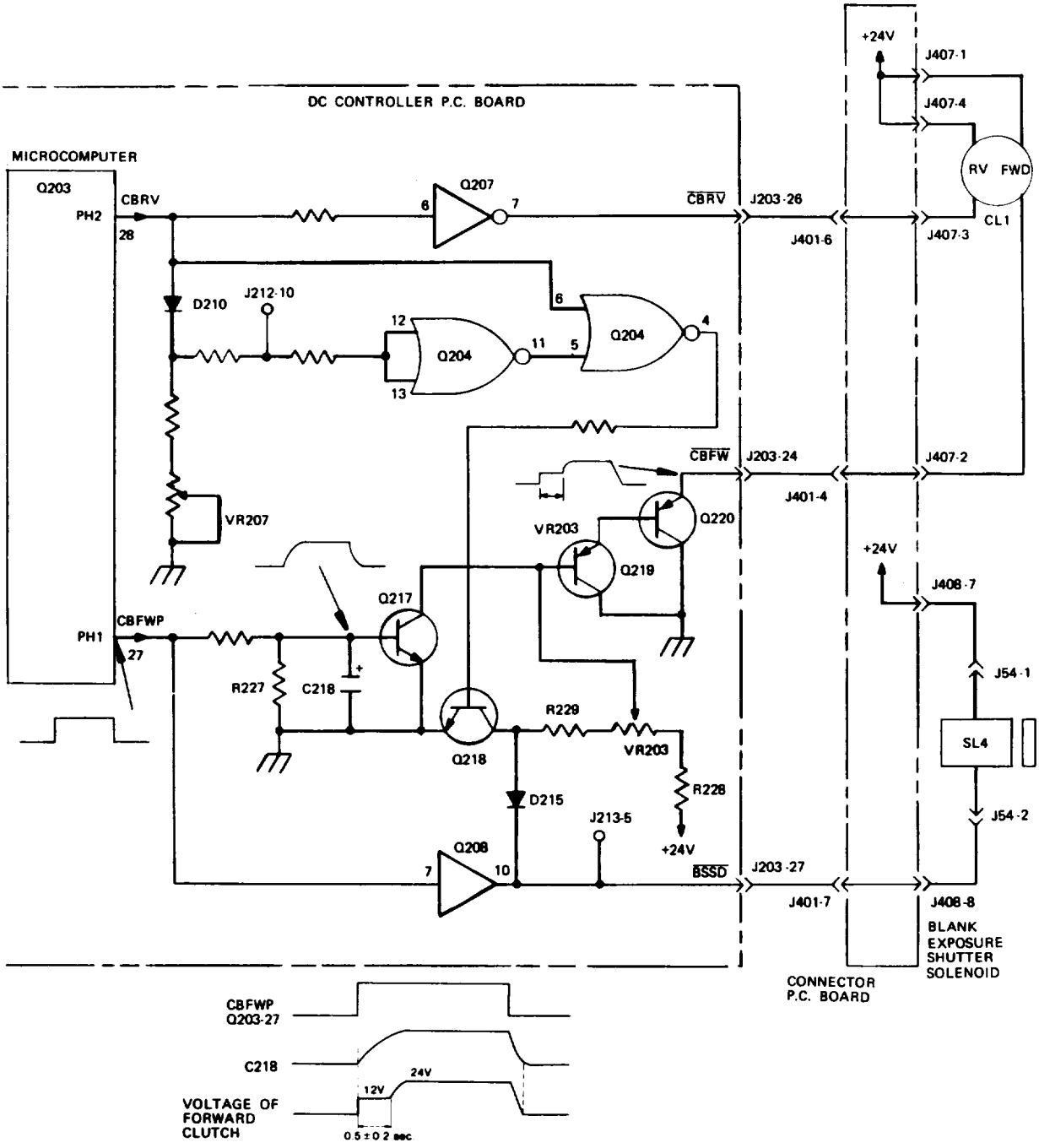


When the COPY START key is depressed, a DRMD command is outputted from Q203-24 to Q208, Q221 thru Q301, solid state relay driving the main motor.

d. Halogen lamp control circuit. The lamp regulator can provide two basic levels of light intensity: Low level for blank exposure and a high level for scanning exposure. The output is varied according to the amplitude of LINT voltage from the dc controller printed circuit card. When LINT is low, light output is low for blank exposure. When LINT is high, light output is high for scanning exposure. When DRMD command is high, inverter Q208 causes Q221 to turn on and provide power to activate the lamp regulator control circuitry. This power supply input is called the IEXP command. Q3 and Q4 form a constant current source keeping the current thru R18 constant. The output from bridge rectifier D2-D5 turns Q5 on, turning off Q6. Q7 is biased on thru the voltage divider network consisting of R26, R17, and R3. This allows C10 to charge. When a certain voltage is reached, PUT Q8 switches on, and discharges C10 thru the primary winding of the PT. The pulse generated in the secondary winding turns on Q1. After C10 discharges, Q8 turns off until the voltage on C10 reaches the firing potential of Q8. The firing point can be synchronized precisely with the same point on every cycle of ac supply to the lamp. Thus, the circuit can control the switch on point of Q1 to provide equal power with varying supply voltages or to vary the intensity of the light for various settings of the exposure control lever. Q2 is turned on by the first pulse from Q8 and remains on until power is secured. The controller basically acts as an analog computer keeping the effective light output constant. The regulator circuit provides feedback voltages (Sample V1 and Sample V2) from a voltage divider across a constant voltage source consisting of R3 and Zener diodes ZD2 thru ZD4. The levels of Sample V2 can be adjusted by VR1 and VR2 but, once set, their outputs remain constant. To provide light for blank exposure, Sample V2 is connected directly to the input of the lamp regulator via the normally closed contacts of K201 so that Sample V2 = LINT. During

the blank exposure, SIEXP = O; thus, K201 is de-energized. To provide high intensity light for scanning exposure, the high LINT input is the output of Q209-11 via pins 4 and 7 of K201. When SIEXP = 1, K201 is energized. Sample V1 is applied to the input of UNITY gain voltage follower Q209/1. The input to voltage follower Q209/2 is raised by applying Sample V2 to one end of a voltage divider, R210 and R209, with Sample V1 at the other end, using the potential at Q209/2 as an input. The two signals have the same relationship at origin as they do at Q209, but are shifted in level. The outputs of Q209/1 and 2 provide reference voltages for exposure settings 1 and 9 of the exposure control. The reference voltages are applied to the two ends of the resistive track of VR601 (exposure control) which acts as a voltage divider that is tapped by a slider. The output of the slider goes through Q209/3. So output Q209/3-11 = LINTT. The resistivity (sensitivity) of the photosensitive cadmium sulfide (CdS) layer of the drum changes when it is exposed to light after a long idle period and reverts to its original dark resistivity if left idle. This change is not instantaneous but takes place over a period of time in each direction. The change in resistivity affects the toner image, so compensation must be provided. This is the function of the Sensitivity Compensation circuit (Lamp Control Timer circuit) for it controls light output and the effect varies with time. It reduces light intensity during the first 30 sec of a continuous copy. It reduces the level of LINT to the greatest extent at the start of the copying cycle and reduces its effect at the end of 30 see, so LINT rises to its normal level. If the copier is not used for a while, the effect of the Sensitivity Compensation circuit is slowly reintroduced, reaching a maximum after 5 min. Prior to copying, RMH1 = O, LINTT = O, and C204 and C205 voltage is approximately 24 V. When copying is initiated, RMH1 = 1, Q210/1 and Q210/2 conducts, thus driving the base of Q210/3 and generating current flow, LINTT, from the emitter of Q210/3. The current source for Q210/2 and Q210/3 is from C204 and C205. The output LINTT is applied to one end of VR206 and a fixed 10 V dc to the other. When LINTT is high (initially as much as 24 V), the base current of Q209/4 is increased, lowering the output of Q209/3-11 (output of LINT). As LINTT decreases, its effect on Q209/4 is decreased. When LINTT falls to O, Q209/4 is controlled by VR206. Q209-4 and Q209-5 pass portions of the current. VR205 controls the amount of current flowing as LINTT. This varies the voltage appearing at the LINTT input end of VR206. VR206 causes an overall shift in the light output. At the end of copying, RMH1 = O, Q210/1 is cut off, and C204 and C205 charge slowly to 24 V. This period lasts 5 min. If copying is resumed during this recharging period, a lower level LINTT output will be supplied until the capacitors again can no longer provide current. The LINTT output is designed to correspond to the sensitivity of the drum at any moment so that the light output during scanning will be correct for producing an image of proper density, whether or not the copier is in constant or intermittent service.

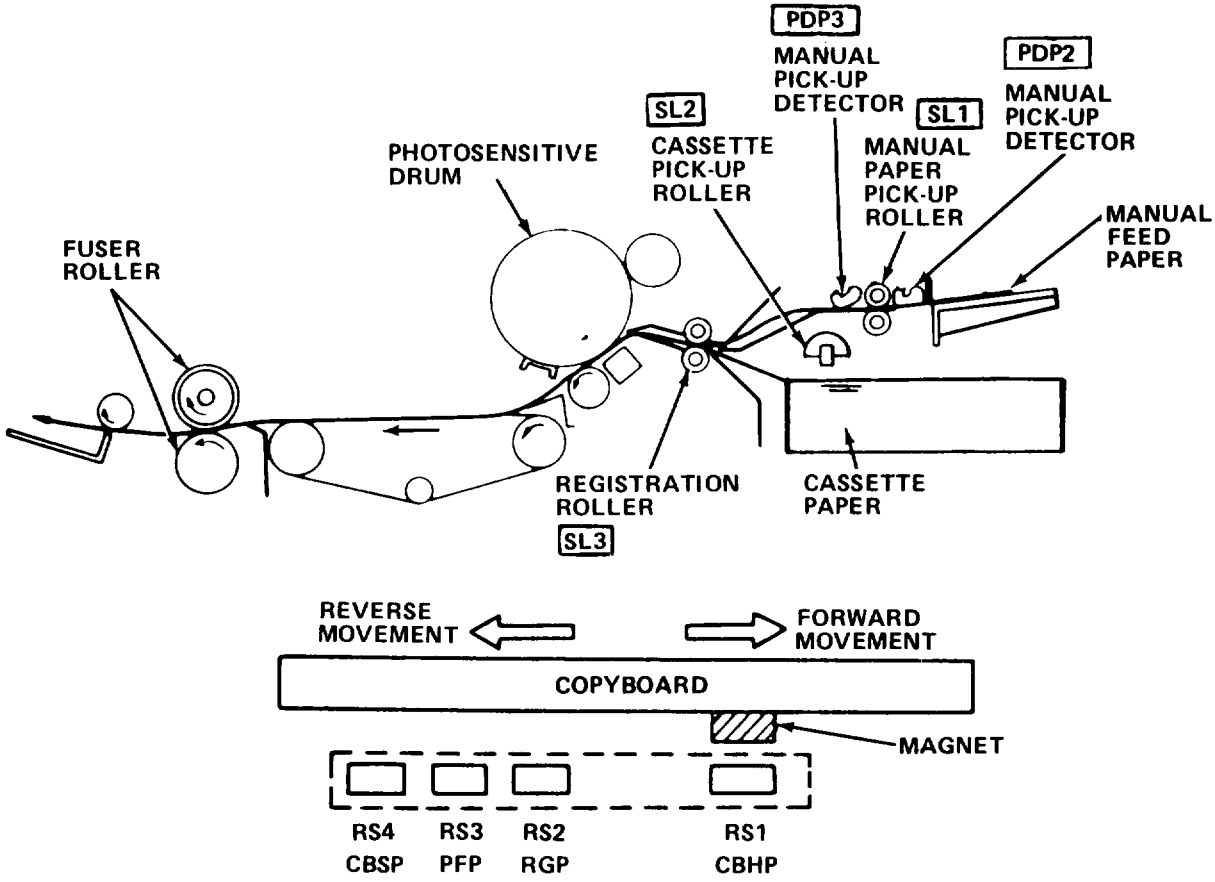
e. Copyboard control circuit.



The main motor drives the copyboard through electromagnetic clutch CL1, which incorporates both forward and reverse clutches. The copyboard moves forward on the CBFW command. (Q203-27 = 1.) It moves backward on the CBRV command. (Q203-28 = 1,)

With no input, the clutch is de-energized. The voltage at the beginning of copyboard forward movement is lowered to about half to minimize the shock of clutch engagement. When CBFW = 1, Q203-27 = 1 and Q208-10 = O, C218 starts to charge causing Q217 collector voltage to decrease enough to forward bias Q219 and Q220. As C218 continues to charge Q219, forward bias increases and clutch voltage rises from 12 to 24 V. Q208-10 = O, causing blank exposure solenoid SL4 to energize. VR203 adjusts forward clutch initial voltage. The reverse clutch is actuated by CBRV command (Q203-28 = 1), which makes Q207-7 = O, Q204-6 = 1, and Q204-4 = O, turning Q218 off. At the same time, C21O starts to charge in preparation for copyboard braking. At the end of copyboard reverse movement, CBRV = O and the reverse clutch disengages, but the copyboard does not stop immediately because of movement. To stop the copyboard at its home position, the forward clutch is activated briefly to act as a brake. At this time, Q203-28 = O, Q209-6 = O, and Q204-11 = O due to the charge on C21O. When C21O starts discharging, Q204-4 = 1 and Q218, Q219, and Q220 conduct, energizing the forward clutch.

f. Copyboard and copy paper feed.



The main motor starts to turn the drum and the developing roller. The halogen lamp lights to precondition the drum. The preconditioning exposure adjusts the resistivity of the cadmium sulfide (CdS) layer of the photosensitive drum. The blank exposure shutter is open and allows the low-intensity light of the halogen lamp to illuminate the photosensitive drum.

(1) Cassette feed. Cassette paper feed solenoid SL2 is activated, releasing the ratchet wheel on the cassette paper feed roller shaft. The feed rollers rotate exactly one-half turn and then stop. The paper feed rollers are flat on one side, and they stop in contact with the paper and hold it in place. SL2 acts to hold the rollers in position. This is called prefeed. At the end of the INTR, the reverse clutch is switched on and the copyboard moves backward to the start position. The CBSP signal is generated to switch the reverse clutch off and the forward clutch on. The halogen lamp output rises to high intensity and the blank shutter closes. When the copyboard begins to move forward, the image exposure begins. When the copyboard magnet approaches reed switch RS3, the PFP signal is generated and SL2 is switched off. This allows the cassette paper feed rollers to rotate farther and feeds the paper sheet up to the registration rollers. As these are not rotating, the paper bellies up. This helps to prevent skew feed. At the end of the scanning movement, the forward clutch disengages and the reverse clutch engages. The distance moved before stopping and returning to the home position depends on the type of paper cassette installed.

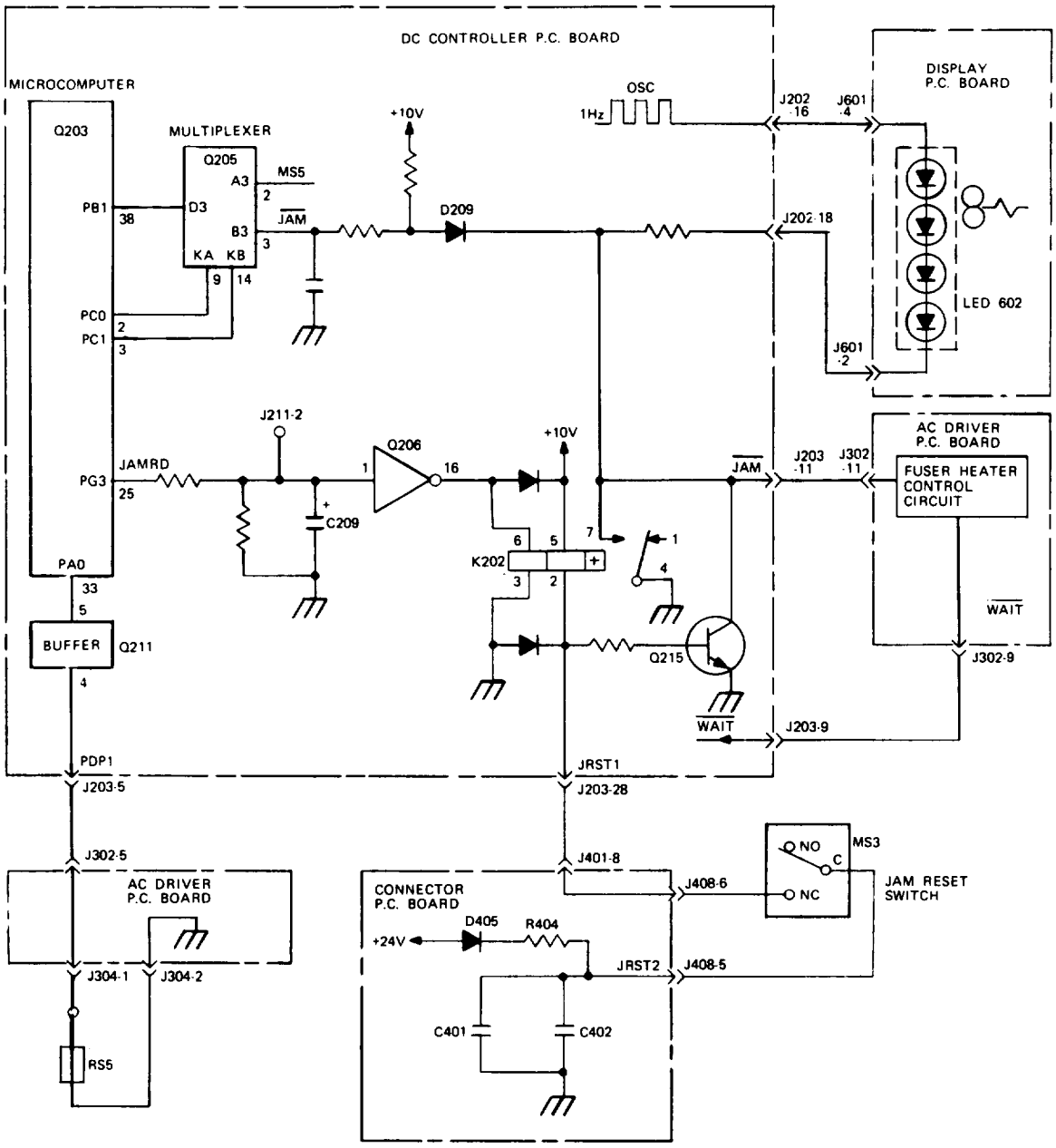
(2) Manual paper feed. When a sheet of copy paper is inserted in the manual paper feed guide, a photocell generates PDP1 signal. After 1.5 see, prefeed begins. Manual paper feed solenoid SL1 is actuated, releasing the ratchet wheel on the paper feed roller shaft. This permits the rollers to begin rotating, pushing the paper partway into the copier. Another sensor then emits PDP2 signal. SL1 is deactivated 35 pulses after PDP2, and the pawl release engages the ratchet wheel, stopping the rotation of the manual feed rollers. This brings the paper to the same point reached during prefeed when using cassette feed. All timing beyond this point is identical to cassette feed, except that SL1 is actuated to release the manual paper feed rollers, which rotate again to feed the copy paper to the registration rollers when the PFP signal is generated.

When the copy paper trailing edge passes the sensor of the PDP2, the manual feed solenoid SL1 again is deactivated and its pawl stops the rotation of the manual paper feed rollers. The manual feed system discriminates between large and small sizes of paper by sensing the time it takes to pass the sensor PDP3. If paper is still present 105 clock pulses after generation of the RGP signal during CBFW movement, it is a large sheet. If no paper is present, it is small.

The position of the copyboard is monitored by reed switches that send signals to the microcomputer when a magnet on the copyboard passes. The process is repeated for every copy. If multiple copies are being made, the copyboard does not stop at the home position after completing a scan, but returns fully to the start position. After completing a scan, light intensity is reduced during the reverse movement. The lamp will switch to high intensity in preparation for the next copying operation 33 pulses after the copyboard passes the home position and sends CBHP signal. When the copyboard finishes its last forward movement and begins to reverse in preparation for stopping at its home position, 8 pulses are added to the time during which the drum rotates. This gives time for the copy counter to rotate.

At the end of 8 pulses, the copier enters the last rotation period to give the drum two turns and to discharge copy paper. During the LSTR (361 pulses), three important steps are accomplished: The latent image on the drum is transferred to copy paper; preconditioning, primary, and transfer coronas are switched off; and the secondary corona is switched to low output. This prevents the drum surface electric potential from becoming too negative and ensures a uniform distribution of charge on the surface.

g. Jam circuit.



Jam detection is programmed in the memory of the microcomputer. The time when a piece of paper starts through the copier-is noted by the microcomputer. After a set period, the sheet should reach the discharge port and open reed switch RS5 which generates PDP1 = 1. If a signal is not generated, a jam has occurred. A jam is identified by flashing JAM indicator LED602 on the control panel. For 22 pulses after the occurrence of a jam, the main motor, secondary corona, and halogen lamp are kept operating in order to remove the primary charge on the photosensitive drum (one-eighth rotation of the drum).

(1) Delay jam. If the copy paper does not reach the detection sensor at the outlet area within 272 pulses following the generation of the RGP signal, it is judged that a delay jam has occurred. Thus, PDP1 = O represents jamming while PDP1 = 1 represents normal copy delivery.

(2) Stationary jam at outlet area. If the correct number of delay jam detection pulses has been generated, no delay jam has occurred. However, if the copy paper has not completely passed the sensor of the detector at the outlet, a stationary jam has occurred at the outlet. PDP1 = 1 indicates there is a jam, whereas PDP1 = O represents normal copy delivery. When a sheet of paper is jammed, the microcomputer emits the JAMRD command. (Q203-25 = 1.) The contacts of latching relay K202 close to flash the JAM indicator LED602. The fuser heater control circuit is activated to switch heater H2 off. Simultaneously, when the multiplexer inputs Q205-3 = O and microcomputer Q203-3 outputs the strobe, Q205-12 generates O and inputs it to microcomputer Q203-38, which prevents operation of the copier. To reset, raising the release handle on the upper assembly changes jam reset switch MS3 to NC from NO. The latching relay K202 is reset by JRST2 = 1 (+24 V), applied to it through D405 and R404 to open the contacts. At the same time Q215 is turned on and JAM indicator LED602 flashes, LED602 will go off if door switches MS1 and MS2 are actuated by lifting the upper assembly or opening the front door. If the power switch is off, latching relay K202 will be reset by the discharge of C401 and C402 through the reset coil. When the upper assembly is closed after jam clearance, the door switches are actuated to supply power to the dc controller. MS3 switches on to set Q205-3 and Q203-38 to 1. Now copying can be resumed. When the upper assembly is not closed properly, Q215 goes on because the NC contact of MS3 is closed, which results in JAM indicator LED602 flashing and Q203-38 being O.

h. Paper/cassette out Indicator Circuit. Cassette sizes are detected by microswitches MS4 and MS5. When a cassette is placed in the cassette holder, the C (common) contact of one or both microswitches changes to the NO contact from the NC to set the output of buffer Q250 to 1, which then will be input to the multiplexer Q205. Paper supply detection lamp LA2 lights simultaneously. If there is no paper in the cassette, light from LA2 shines on CdS1 and lowers its resistance, PEP = O, Q213-4 = 1, and LED205 is on. Q216 grounds the output of buffers Q250-11 and Q250-13 regardless of the actual buffer outputs. Since the outputs of Q250 are tied to Q204-3 = 1, Q206-3 = 1, and Q206-13 = O, and PAPER/CASSETTE OUT indicator LED603 flashes, VR202 is the sensor adjustment.

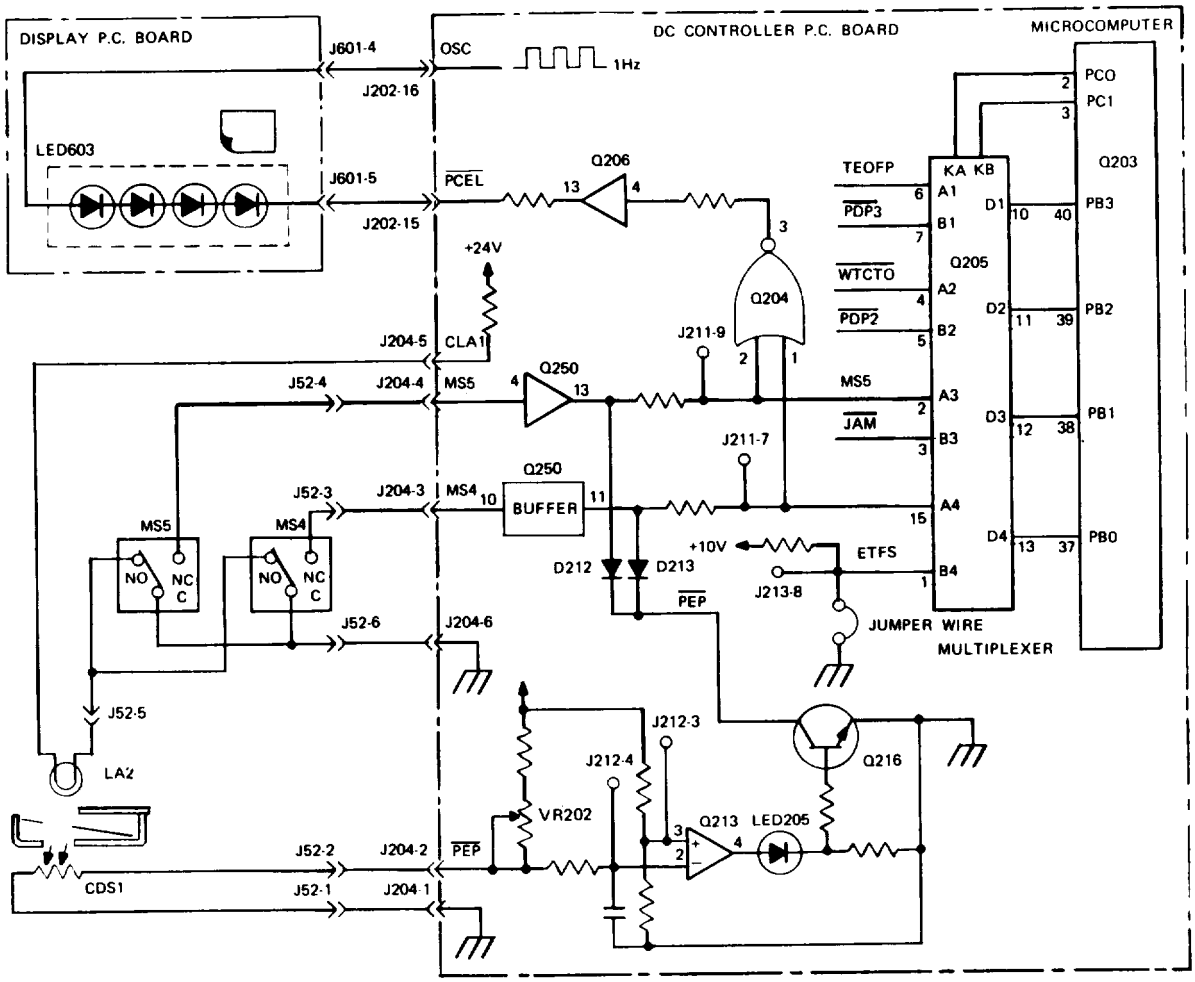


Table 3-1. CASSETTE MICROSWITCH LOGIC

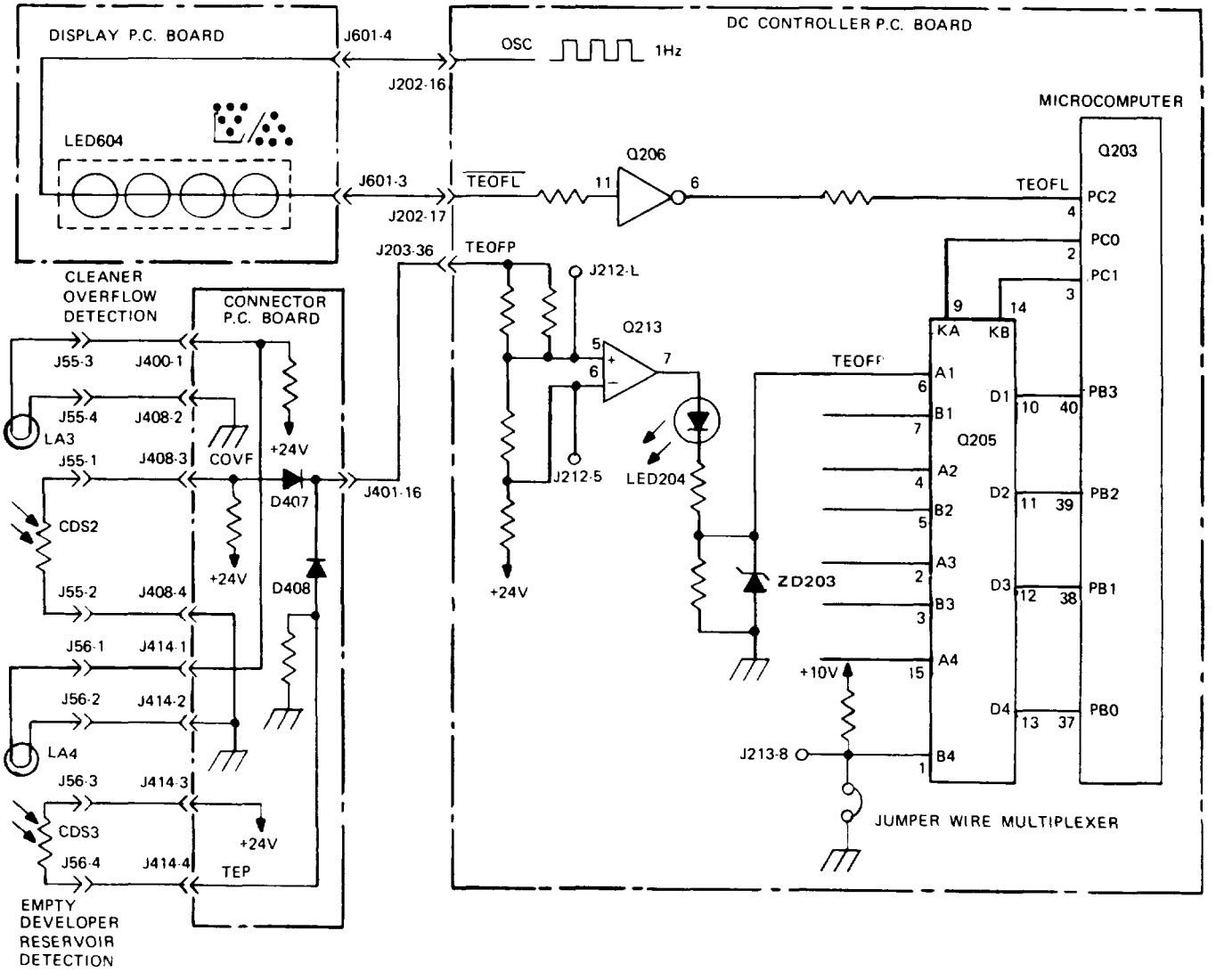
Type	MS 4	MS 5	Paper Size
No Cassette	0	0	
Letter	0	1	Small
Mini	0	1	Small

NOTE

"1" means that the switch contacts are open (c to NO side).

"0" means that the switch contacts are closed (c to NC side).

i. Developer OUT/WASTE Developer Indicator Circuit.

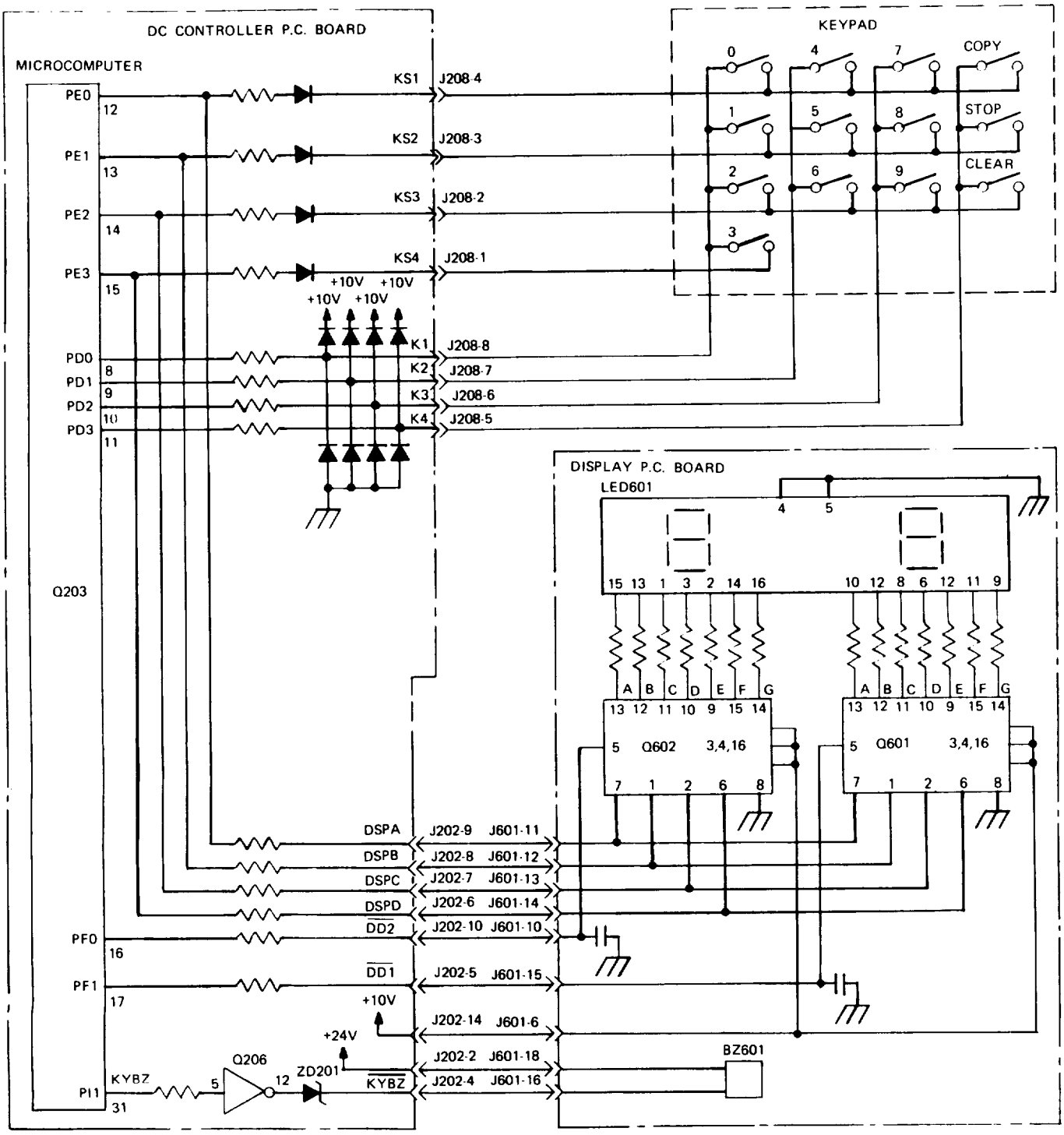


The TEOFP signal appears when developer in the reservoir runs low or waste developer in the cleaning unit receptacle exceeds the prescribed volume. Under normal operation, waste developer COVF signal is low and light from lamp LA3 shines on CdS2, keeping its resistance low. When COVF is low, LED204 is off and the output of Q205-6 = 0 (TEOFP).

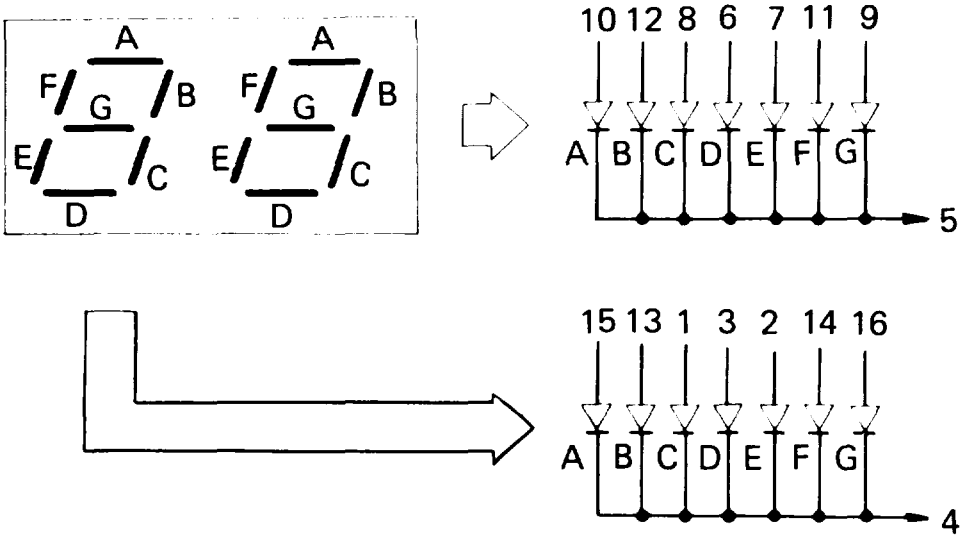
When the waste receptacle is full, light from LA3 is blocked, CdS2 resistance is high, COVF signal is high, LED204 is on, and Q205-6 = 1. ZD203 holds the input voltage to 9.1 V. When the developer supply is adequate, the light from lamp LA4 is blocked by CdS3, so the resistance of CdS3 is high, TEP = 0, Q213-7 = 0, LED204 is off, and Q205-6 = 0 (TEOFP).

When the developer supply runs low, light from LA4 reaches CdS3, decreasing its resistance, TEP = 1, Q213-7 = 1, LED204 is on, and Q205-6 = 1 (TEOFP). Q203-4 outputs TEOFL to inverter 0206-6. Q206-11 = TEOFL and 1 Hz input causes developer OUT/WASTE developer indicator LED604 to flash.

j. Keypad and copy number display.



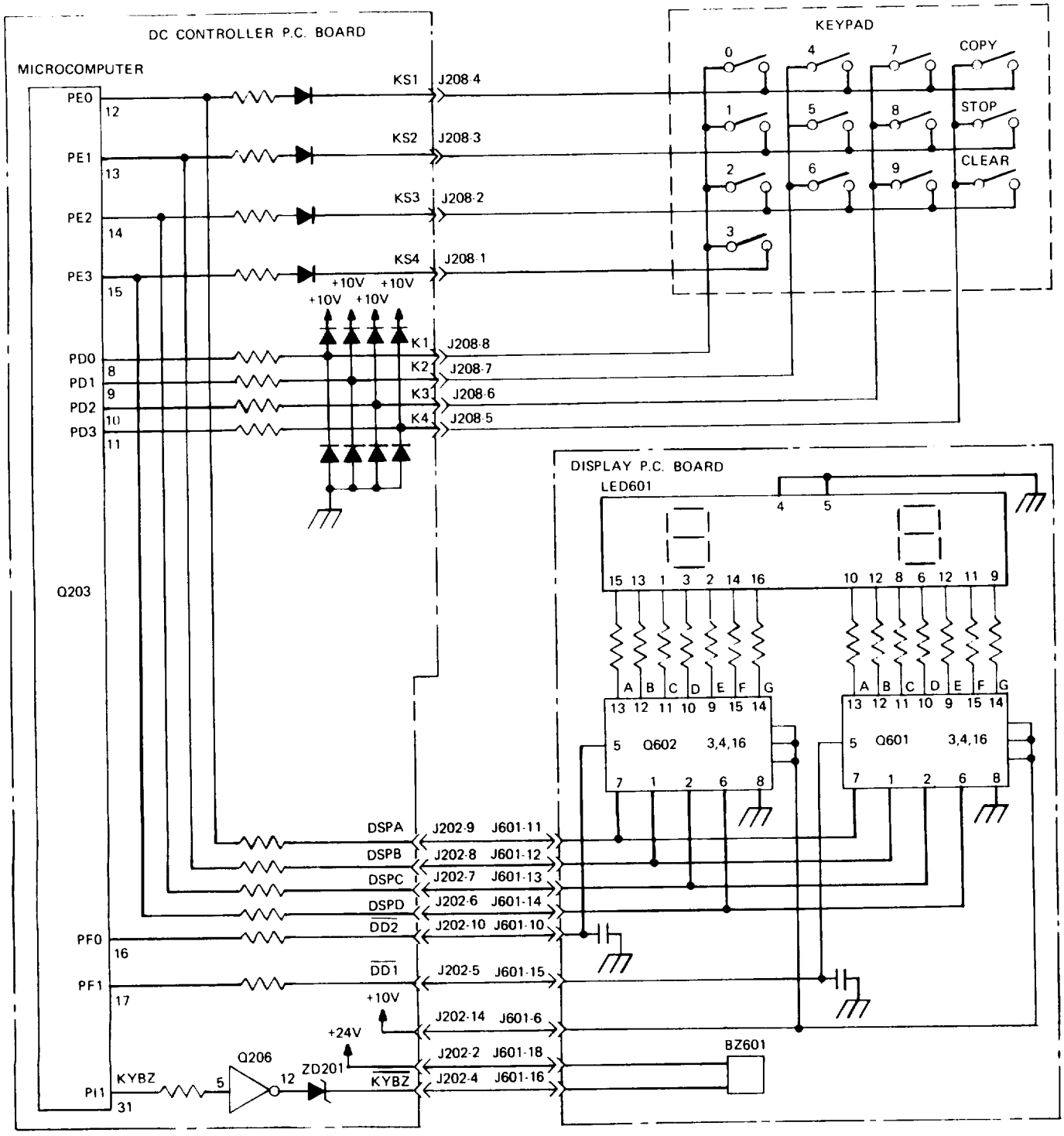
The control panel has 13 keys (keypad type) which are connected in a matrix. Each output, KS1 thru KS4, is 10 V. When one key is depressed, a connection to one KS1 thru KS4 provides an input to the microcomputer. Each key generates an input that is unique to that key and causes the microcomputer to control the copying action and to display the number of copies on the copy number display. If key 2 is pressed (for two copies), the microcomputer interprets the input and stores 2 in RAM. After each copy, it subtracts 1 from the number in RAM. When the number becomes 0, it stops the copying run.



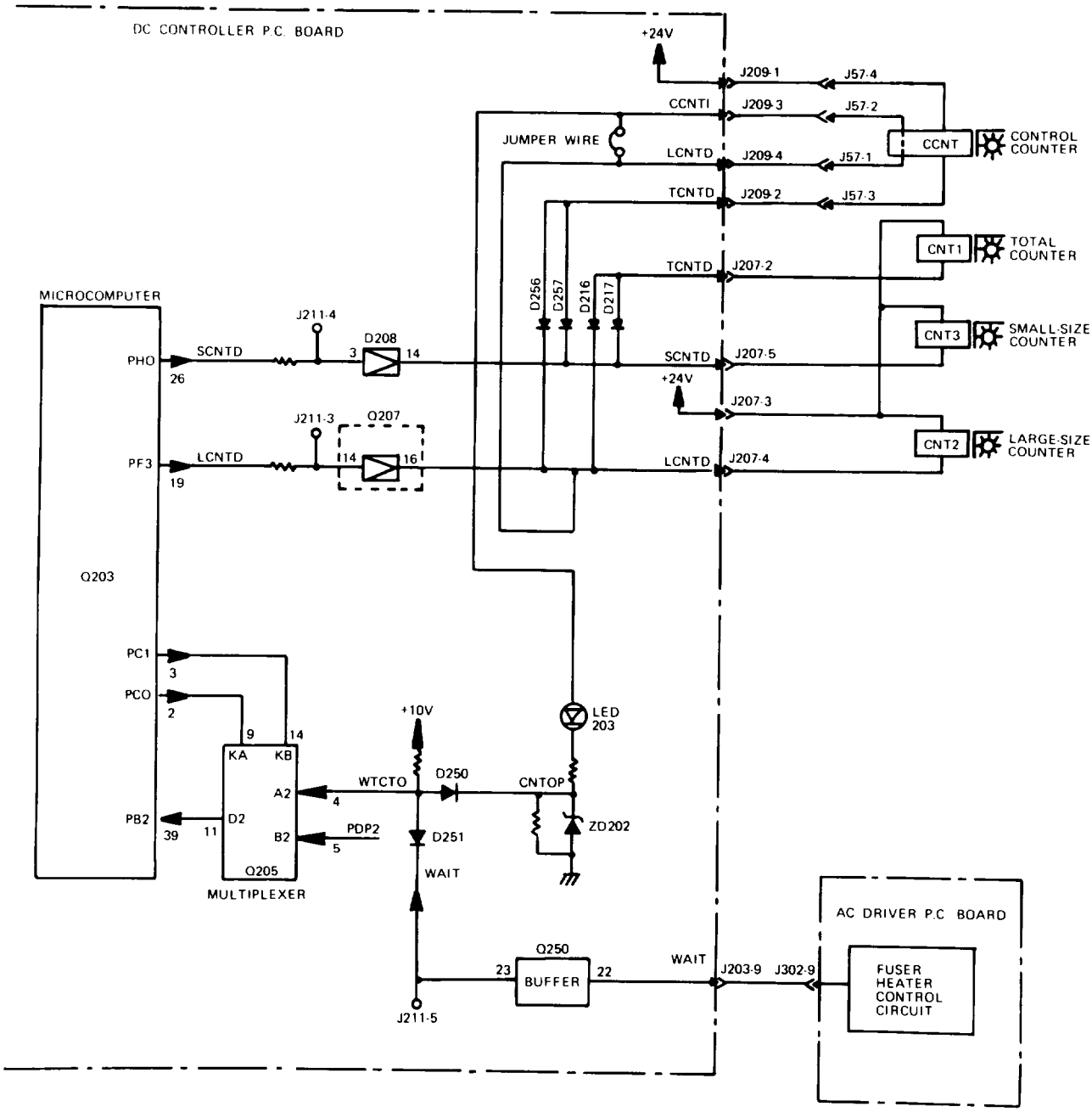
The number of copies required is shown by 2 seven-segment LED displays which are controlled by the microcomputer. The output from the microcomputer employs the same ports as the outputs of KS1 thru KS4, but there is no confusion between them because the outputs occur at different times. After the COPY START key is pressed, the displayed number of copies will be decreased by 1 every time the copyboard reaches the reversal point. When the copyboard passes through the reversal point while making the final copy, the display is changed to show the original number of copies that was set.

When the copier is left unattended for about 30 see, after either the end of the final copy of a copy run or after keying in the number of copies to be made, the copy number display is reset to 1. If the paper supply runs out during a multiple copy run or a jam occurs, the display will continue to show the reading at the time.

There may be cases when clock pulses are not generated (output remains at 1 or 0) while the microcomputer is outputting a DRMD command. The cause may be failure of the Drum Clock circuit or main motor. After about 2.5 sec, the microcomputer judges it as a clock pulse failure, stops the copier, and actuates buzzer BZ601 continuously.

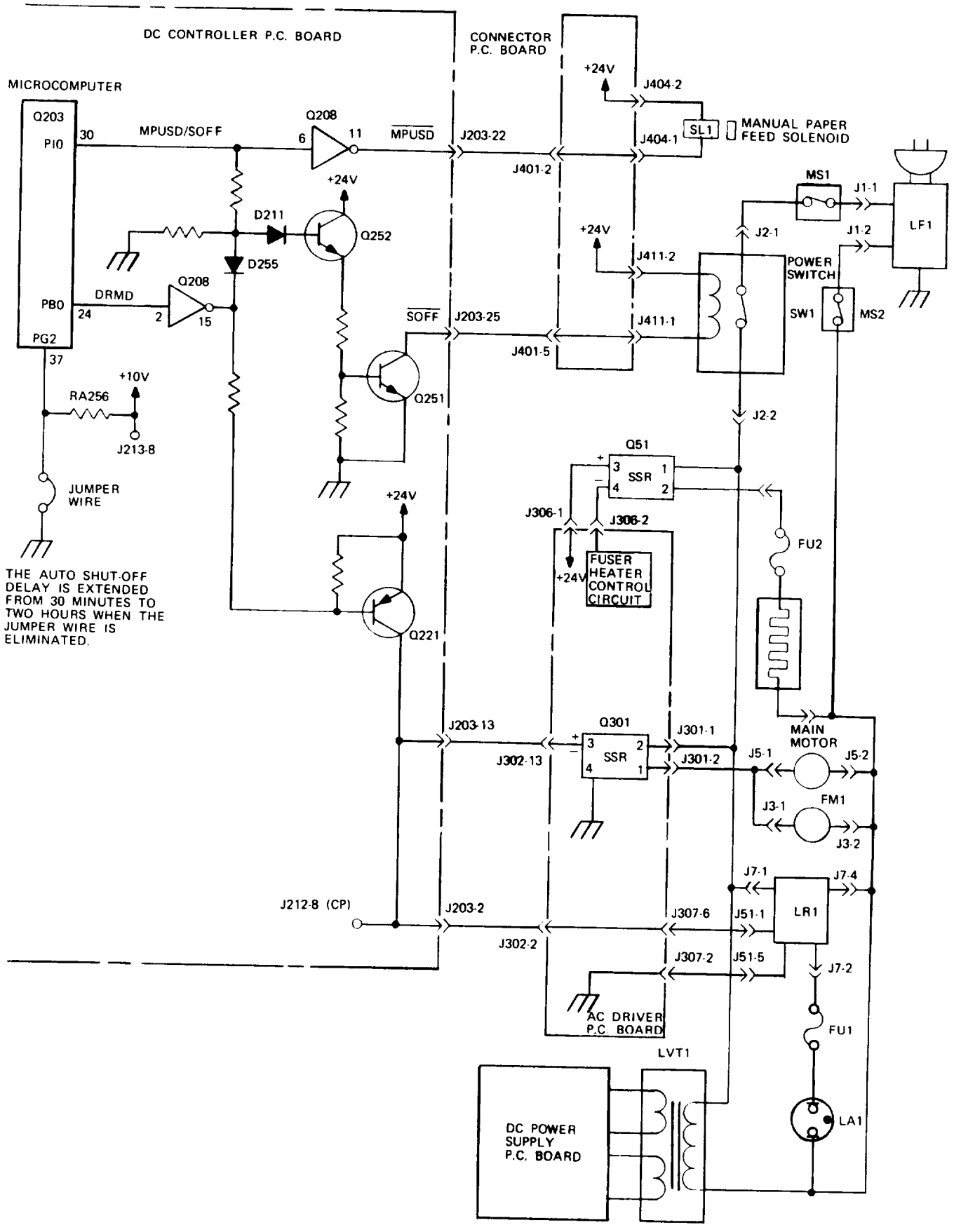

DC CONTROLLER P.C. BOARD
MICROCOMPUTER
KEYPAD
DISPLAY P.C. BOARD
LED601
Q203
Q602
Q601
Q206
ZD201
BZ601
KS1
KS2
KS3
KS4
K1
K2
K3
K4
PE0
PE1
PE2
PE3
PD0
PD1
PD2
PD3
PF0
PF1
PI1
KYBZ
DSPA
DSPB
DSPC
DSPD
DD2
DD1
+10V
+24V
COPY
STOP
CLEAR

k. Copy counter fault detection circuit.



Copying is disabled when there is a 0 input at Q205-4 (WTCTO). Input WTCTO is the output of an OR gate consisting of 0250 and D251. If WAIT = 0 (from Fixing Roller Heater Control circuit via Q250-23) appears at D251 (during warm-up) or CNTOP = 0 appears appears at D250 (due to a fault in the copy counter), WTCTO = 0 appears at Q205-4.

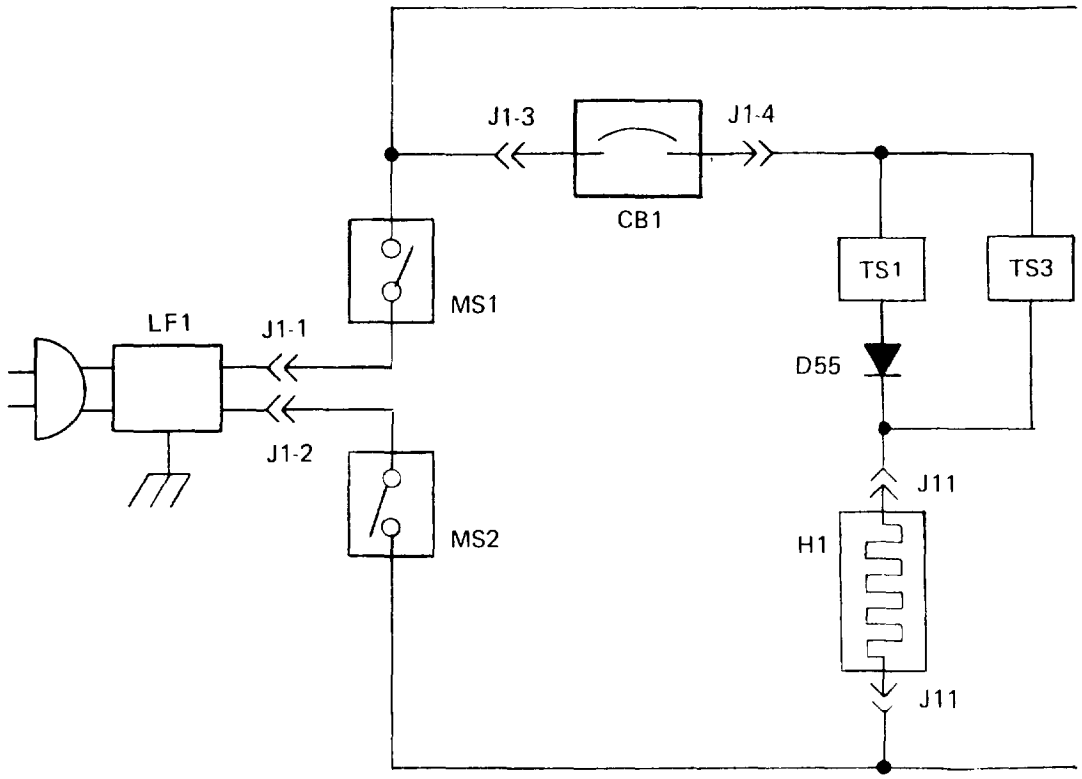
(1) Auto shutoff circuit. If there is no copying action or keystrip input for 30 min, the SOFF command will be generated. (Q203-30 = 1.) This turns Q252 and Q251 on, so Q251 provides a current path through the coil of power switch SW1 and turns the power switch off. Output from Q203-30 is also used as the MPUSD signal. If a DRMD command is present at the same time, the output of inverting driver Q208-15 becomes 0, so Q252 and Q251 switch off and the auto shutoff function is bypassed, so the copier continues to function. The auto shutoff circuit can be switched over to a 2 hr period by removing the jumper wire.


DC CONTROLLER P.C. BOARD
CONNECTOR P.C. BOARD
MICROCOMPUTER
Q203
PI0
30
MPUSD/SOFF
Q208
6
11
MPUSD
J203-22
J401-2
+24V
J404-2
J404-1
SL1
MANUAL PAPER FEED SOLENOID
MS1
J1-1
J1-2
LF1
J2-1
D211
Q252
D255
+24V
J411-2
POWER SWITCH
SW1
MS2
Q208
DRMD
PB0
24
2
15
SOFF
J203-25
J401-5
J411-1
PG2
37
+10V
RA256
J213-8
Q251
J2-2
Q51
SSR
3
4
1
2
JUMPER WIRE
THE AUTO SHUT-OFF DELAY IS EXTENDED FROM 30 MINUTES TO TWO HOURS WHEN THE JUMPER WIRE IS ELIMINATED.
+24V
J306-1
J306-2
FUSER HEATER CONTROL CIRCUIT
FU2
Q221
J203-13
Q301
J301-1
MAIN MOTOR
J302-13
J301-2
J5-1
J5-2
J3-1
FM1
J3-2
J7-1
J7-4
J212-8 (CP)
J203-2
J307-6
J51-1
LR1
J302-2
J307-2
J51-5
J7-2
AC DRIVER P.C. BOARD
FU1
LVT1
DC POWER SUPPLY P.C. BOARD
LA1

m. Power circuits. Consists of the following circuits and components:

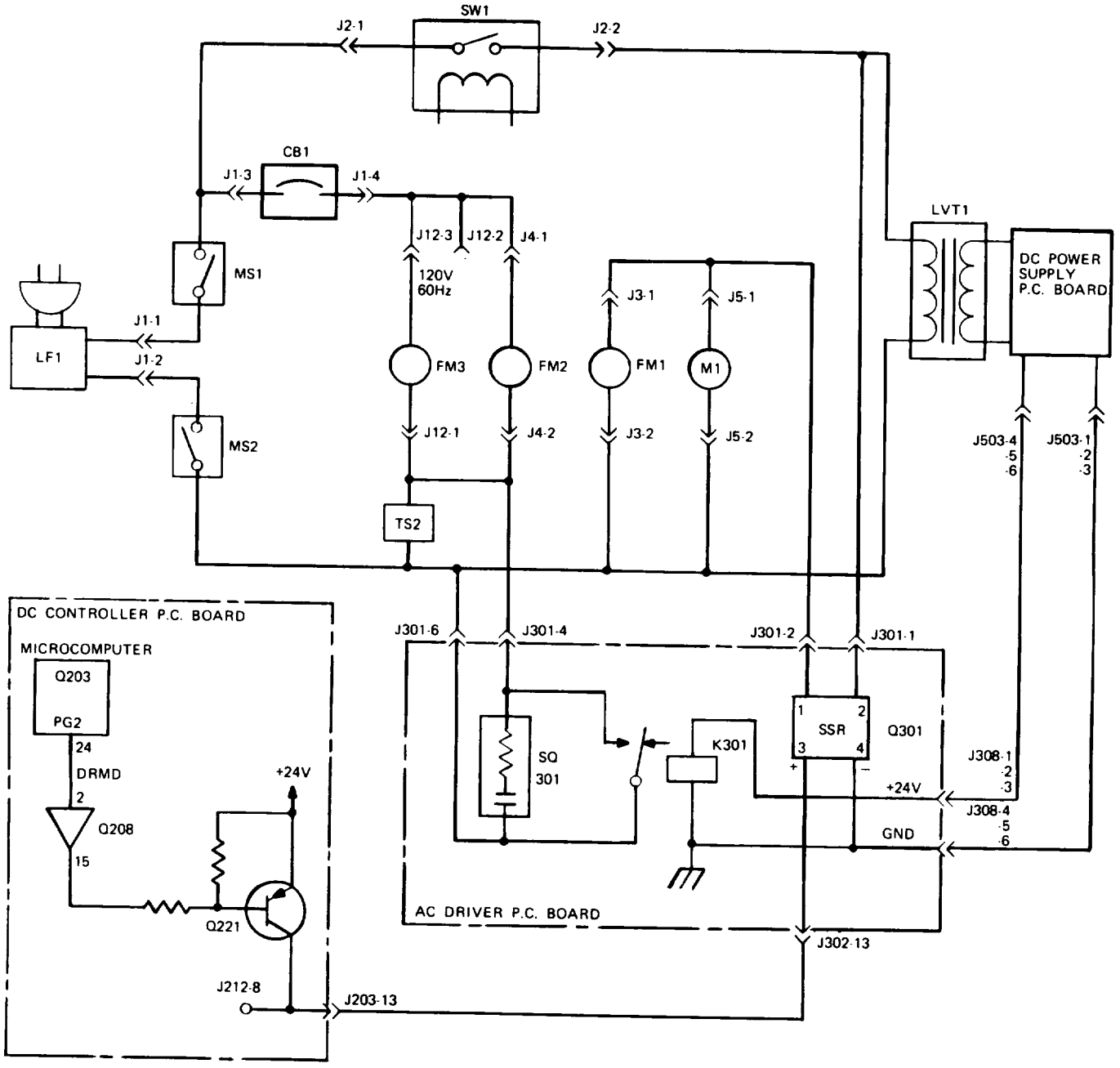
Drum Heater Control Circuit (1)
Fan Motor Control Circuit (2)
Power Supplies (3)

(1) Drum heater control circuit.



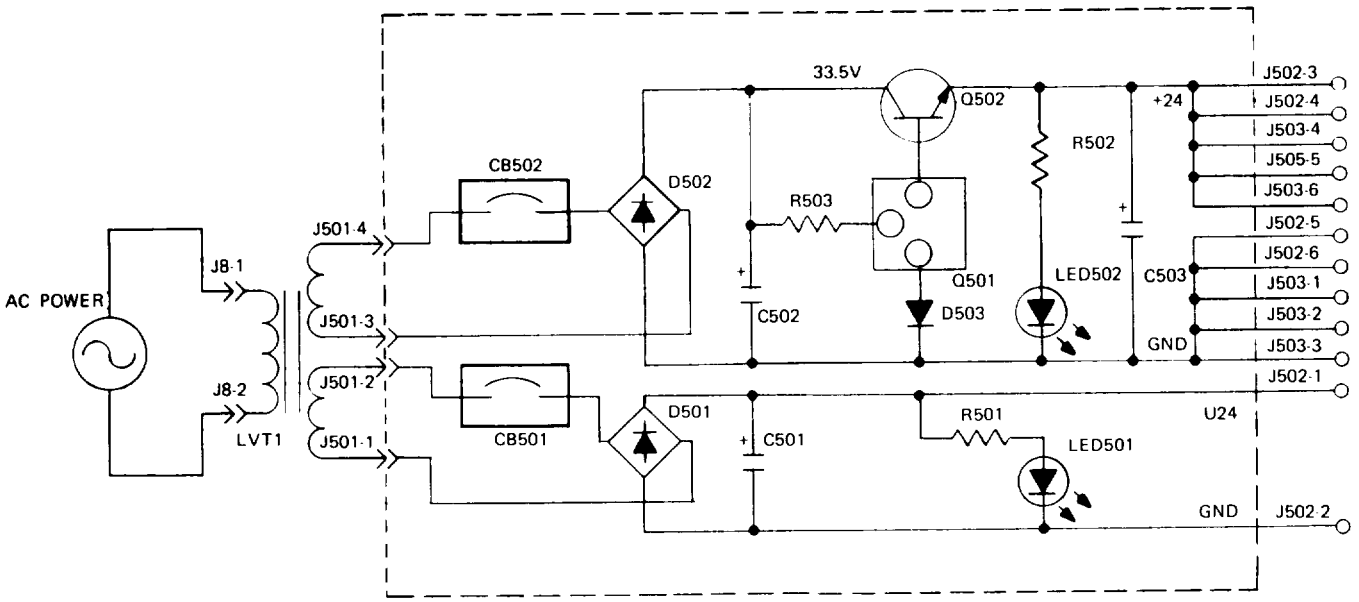
The heater is incorporated inside the drum shaft to maintain the photosensitivity of the drum, regardless of external temperature and humidity changes. Current of 120 V, 60 Hz is applied through LF1 to door switches MS1 and MS2. If the upper assembly or the front panel is open, the switches open, interrupting primary power. When both switches are closed, power is applied to circuit breaker CB1. If the temperature is below 60.8°F (16 C), thermal switches TS1 and TS3 close, applying full power to heater H1. When the temperature rises above 105.8°F (41°C), both switches open and the heater is off. Between 73.4°F (23°C) and 95°F (35°C), TSI is closed, TS3 is open, and half-wave rectified power is fed to the heater.

(2) Fan motor control circuit. When power switch SW1 and door switches MS1 and MS2 are closed, primary power is applied to transformer LVT1, enabling the 24 V dc supply which energizes K301. This energizes exhaust fans FM2 and FM3. SQ301 is a noise filter. When DRMD = 1, solid- state relay Q301 is enabled, energizing the main motor and intake fan FM1. When the power switch is off and the temperature is above 131°F (55 C), thermal switch TS2 closes, enabling exhaust fans FM2 and FM3. When the temperature decreases below 113 F (45°C), the thermal switch opens. An activated carbon filter between the exhaust fans and halogen lamp absorbs ozone that is generated by the corona units so that it cannot enter the atmosphere.



(3) Power Supplies. Four different power supplies are used to drive loads:

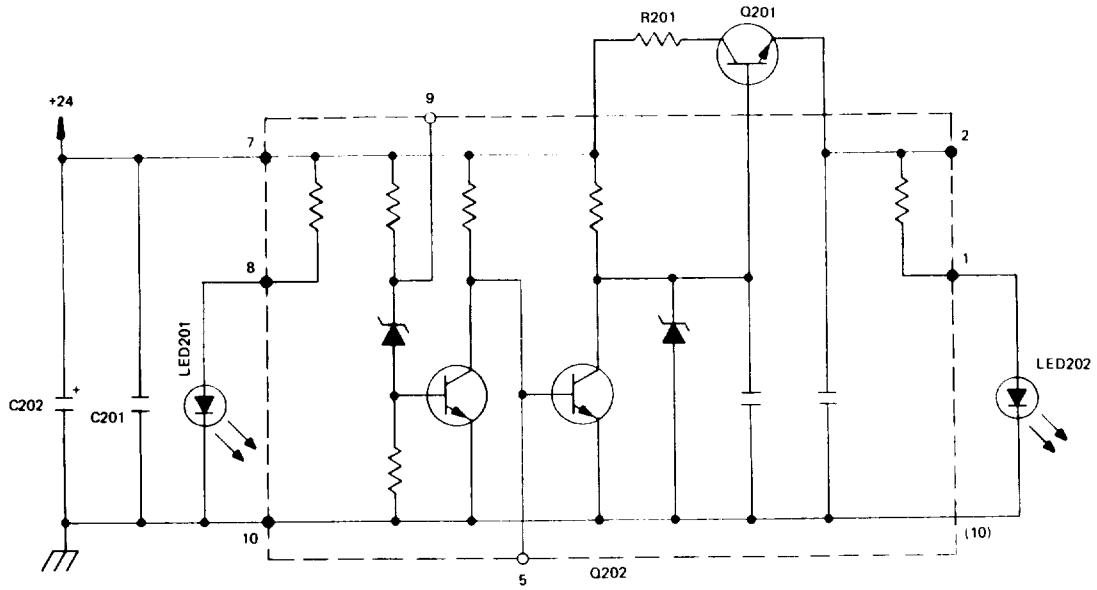
24 V dc Regulated Supply (a)
24 V dc (U24) Unregulated Power Supply (b)
10 V dc Regulated Supply (c)
High Voltage Power Supplies (d)

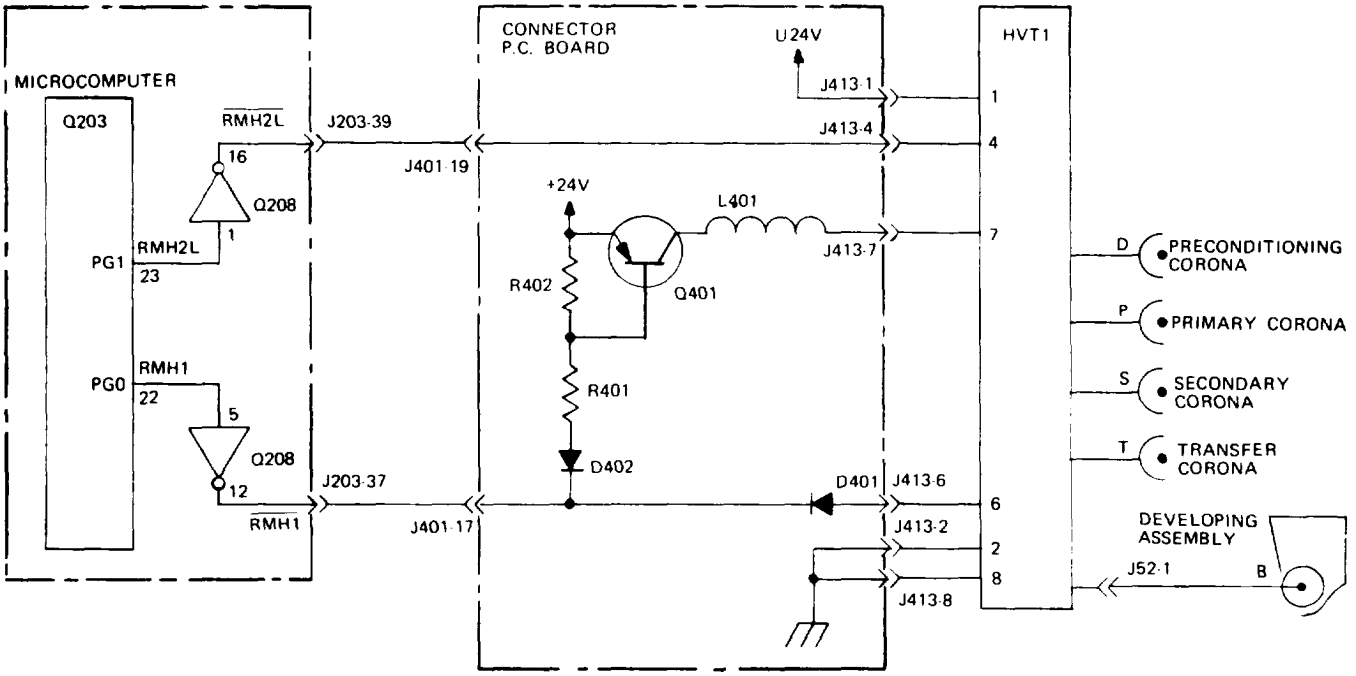


(a) 24 V dc regulated supply. Is used to drive the unit bias supply, clutches, solenoids, counters, and photo-interrupters. Circuit breaker CB502 will open if the current exceeds 3.15 amps. If LED 502 is on, it is functioning properly.

(b) 24 V dc (U24) unregulated power supply. Is used to drive corona high-voltage transformers. The supply is protected by circuit breaker CB501, which opens if the current exceeds 3.15 amps. If LED501 is on, it is functioning correctly.

(c) 10 V dc regulated supply. Is used only in the microcomputer. The supply uses the regulated 24 V dc supply and converts it to 10 V dc. If the circuit is functioning properly, LED201 and LED202 will be on, indicating that the 10 V dc and 24 V dc supplies are functioning properly.



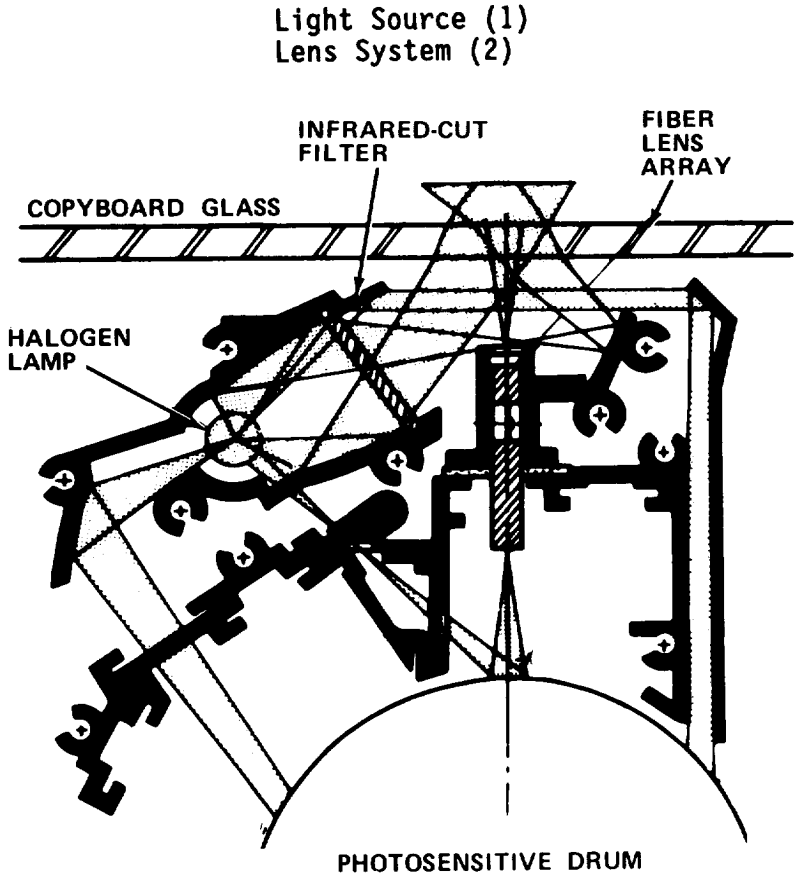


(d) High-voltage power supplies. The high-voltage transformer provides high voltages to various corona units and the developing assembly, as commanded by microcomputer Q203. There are two power supplies for the high-voltage transformer: an unregulated 24 V dc to HVT1-1 for primary, secondary, transfer, and preconditioning coronas (U24 V dc) and a regulated 24 V dc input to HVT1-7 for developing unit bias. When Q203-22 outputs RMH1, the input to HVT-1-7 = 0 and primary, secondary, transfer, and preconditioning coronas are enabled. At the same time, Q401 turns on to provide 24 V dc to HVT1-7, which provides developing unit bias. When DRMD = 1 from Q203-24, HVT1-5 = 0 and secondary corona voltage is high (-6.5 kV). When RMH2L = 1, the voltage is low (-5.5 kV).

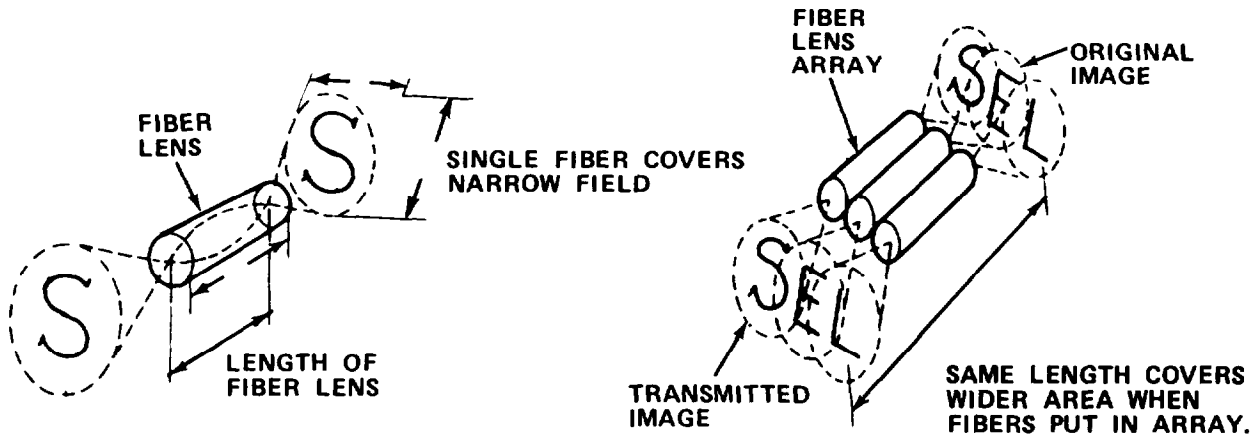
HIGH-VOLTAGE OUTPUT

Preconditioning	-5.1 kV
Primary	+6.3 kV
Secondary	-6.5 kV (High Output) -5.5 kV (Low Output)
Transfer	+6.3 kV
Developing Bias	1 kV ac P-P, 0.4 kHz

n. Optical system. Consists of the following components:



(1) Light source. A single, 300 w halogen lamp provides light for preconditioning exposure, scan illumination, blank exposure, blank strip exposure, and overall exposure. The halogen lamp has two intensity levels: high intensity (bright) for scanning illumination and low intensity for blank exposure and preconditioning. Light from the halogen lamp illuminates the original on the moving copyboard. The image is projected through the lens as a narrow strip across the photosensitive drum surface. The drum surface revolves at exactly the same speed as the image of the original is advanced by the copyboard, so the image is spread around the drum in the correct register. Light from the lamp is rich in red and infrared. This light would reflect strongly from red colors so they would appear almost like blank areas and reproduce weakly. The infrared filter blocks much of this light, thus improving the reproduction of reds.



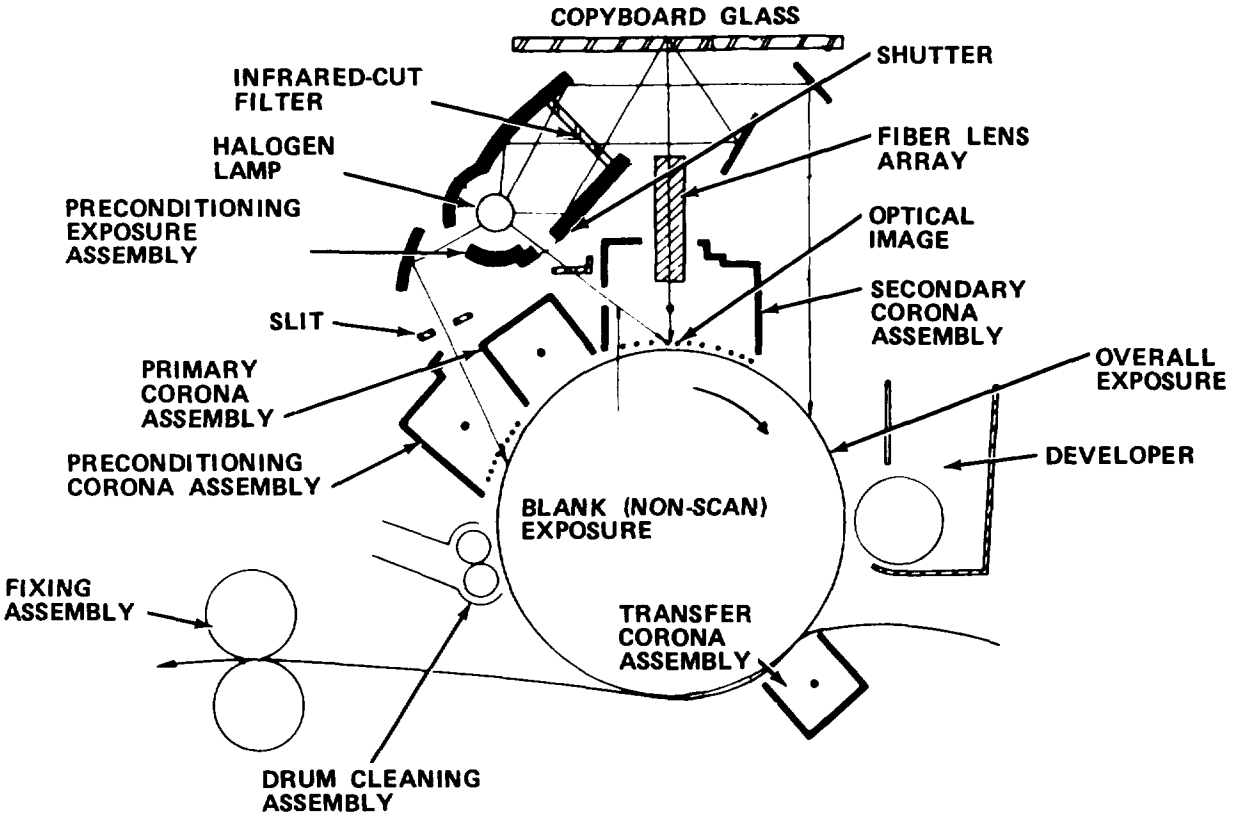
(2) Lens system. The copier uses a fiber optic lens array to focus a 1:1 (full size) image on the drum during the scanning stage. Fiber lenses are used because of the small distances between lens and subject, whereas conventional lenses require large distances. A fiber optic lens can be made so that it focuses an image in a very short distance; its focal length is a function of its length only. However, the field covered by a single fiber lens is small. To increase the coverage to the width of the page, many fiber lens rods are arranged side by side in an array so that their fields overlap. The fibers in the array are 0.4 in. (1 mm) in diameter and are arranged in two staggered rows with a total width of 11.811 in. (300 mm) . The major benefits of using fiber optic lens arrays over spherical lenses are: The image can be focused in a very short distance, and light distribution and resolution are uniform across the width of the fiber.

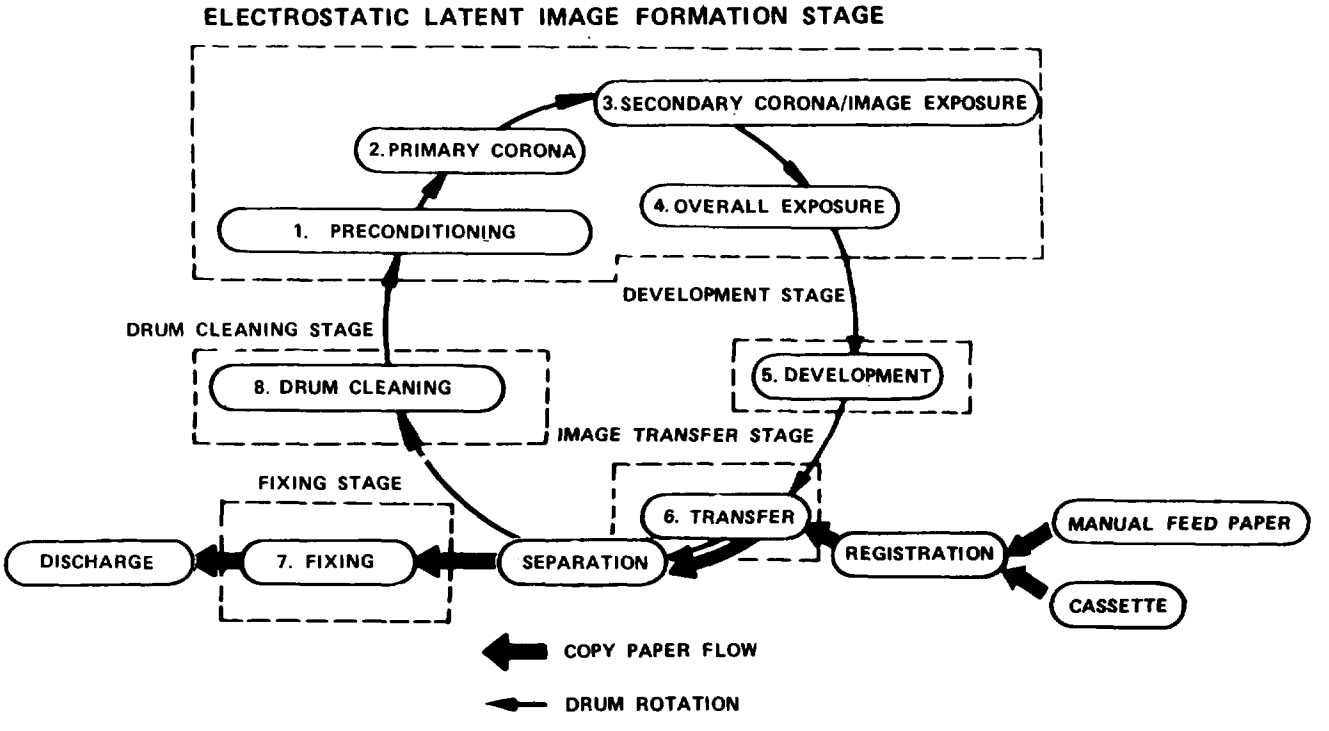
3-3.3 Sequence of Operation.

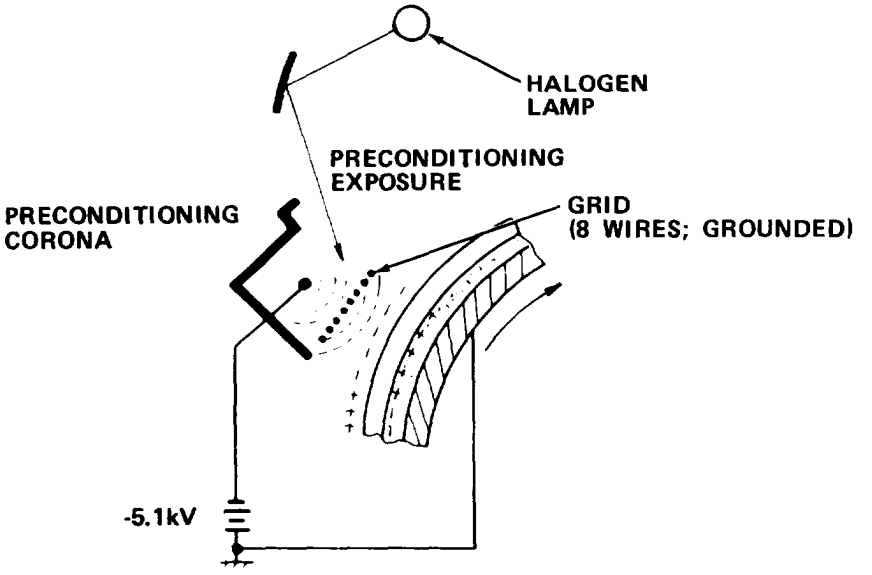
a. Image Formation. The process consists of eight steps:

Preconditioning Exposure Corona (1)
Primary Corona (2)
Secondary Corona Image Scanning Exposure (3)
Overall Exposure (4)
Development (5)
Image Transfer (6)
Fixing (7)
Drum Cleaning (8)

(1) Preconditioning exposure corona.

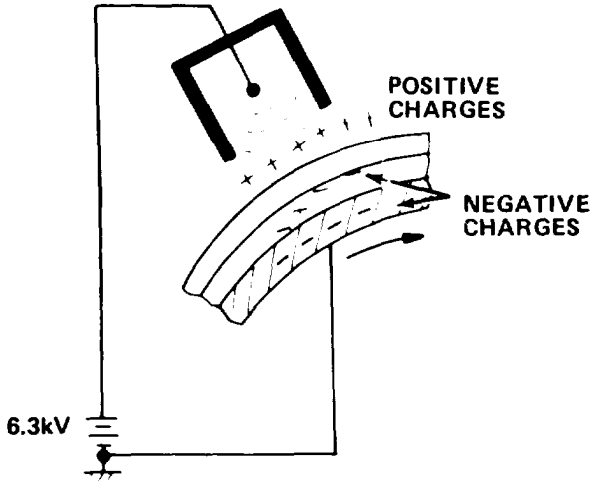






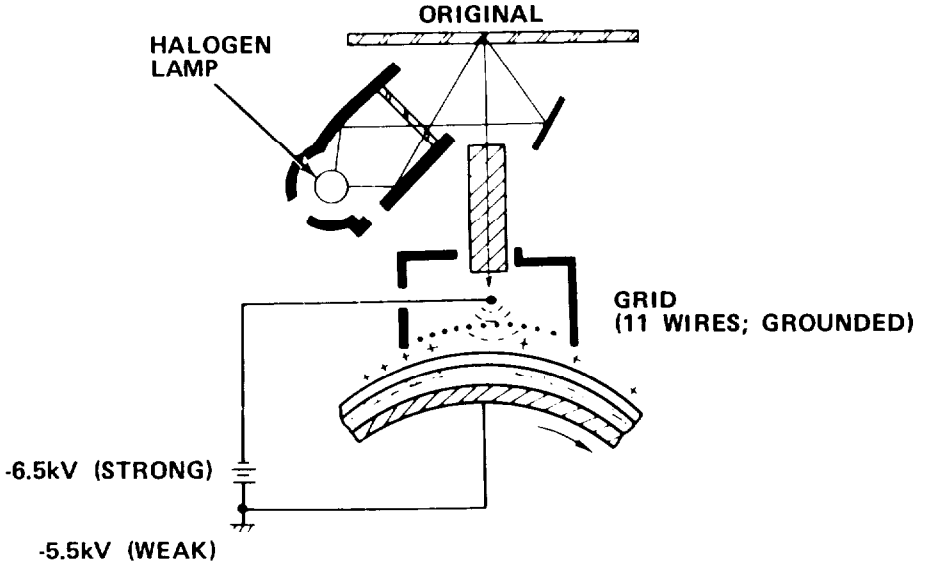
The preconditioning corona removes all residual positive charges from the surface of the rotating drum, leaving a uniform negative charge. This assures even copy density. The drum is also exposed to the halogen lamp. This restores the resistivity of the CdS layer to the correct operating range.

(2) Primary corona.



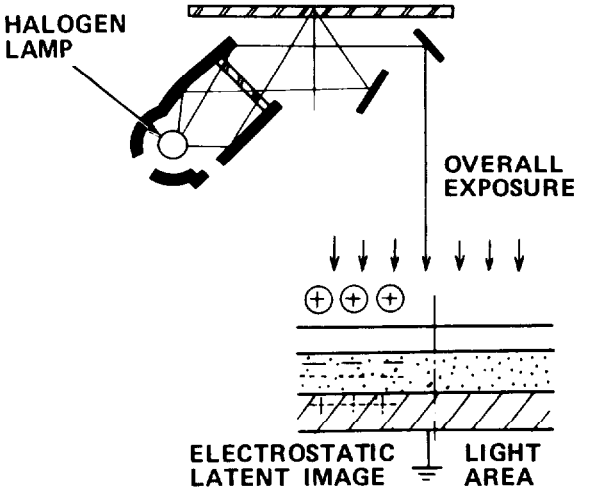
The primary corona applies a uniform positive potential to the drum surface as it passes. Electrons are drawn from the aluminum base through the CdS layer to the underside of the insulating film to balance the positive charges.

(3) Secondary corona image scanning exposure.

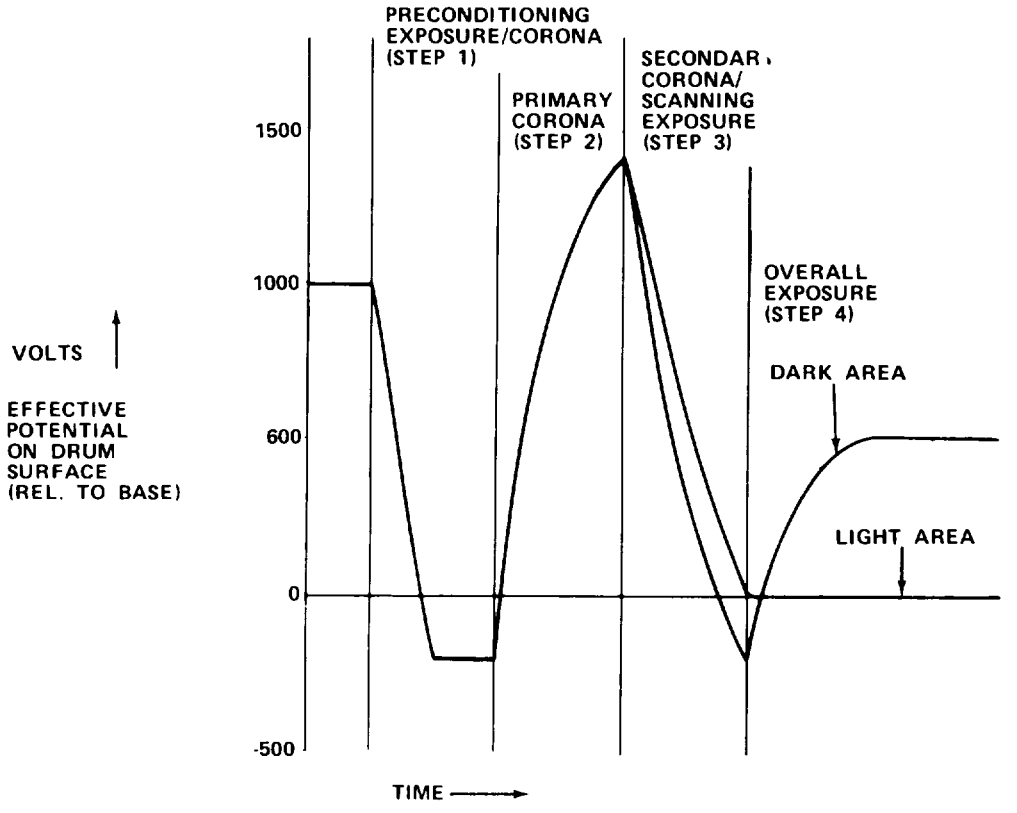


In this step, a narrow strip of the original is projected on the drum through the lens array. The copyboard and drum surface move at the same speed, so the image is spread around the drum. Where light strikes the drum, all positive charges are removed and the resistivity of the CdS layer drops. In the dark areas, the CdS layer resistivity remains high. The surface charge in both light and dark areas is zero due to the balance attained by the positive charges and electrons. During the scanning step, the corona is at -6.5 kV. This is reduced to -5.5 kV during the last rotation so that the drum is not left with a negative charge.

(4) Overall exposure.

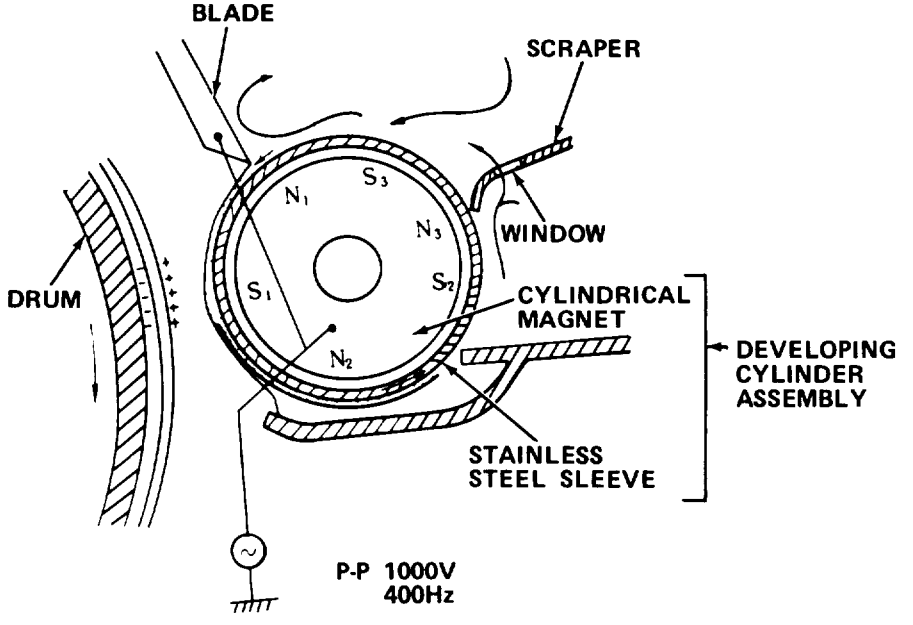


The overall exposure step reduces the resistivity of all areas of the CdS layer to the same level. Trapped electrons are freed in the CdS layer. This intensifies the effect of the surface" positive charges. The positive charges on the surface make up the electrostatic latent image.

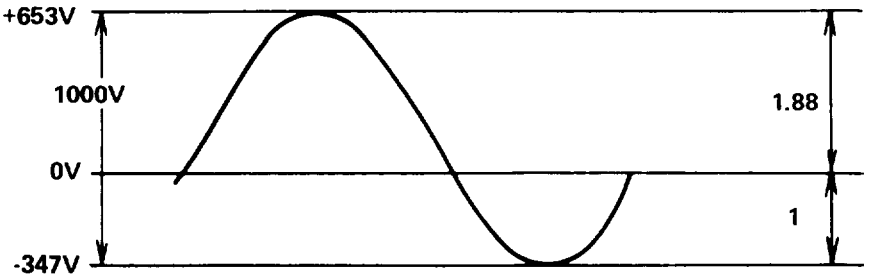


There is now a pattern of positive charges on the drum surface that corresponds to black areas of the original and a negative charge corresponding to the light areas of the original. This can be developed to a visible image and is called latent image.

(5) Development.

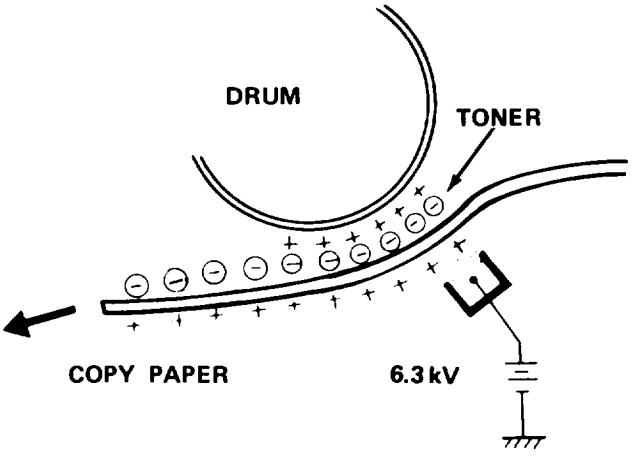


The development stage converts the electrostatic latent image on the drum surface into a visible image by means of developer powder. The developing system consists of a fixed, six-pole, cylindrical magnet, a concentric stainless-steel sleeve rotating around it, a skimming blade, and a scraper. A single-component developer powder that combines toner and carrier in each solid particle is used. The toner is made of tiny particles of magnetic material embedded in a resin. The toner is an insulator, and each particle acquires a negative charge by friction with the rotating stainless-steel cylinder. Because each toner particle has magnetic properties, the cylindrical magnet inside the sleeve can attract a thick layer of powder to the sleeve as it revolves through the reservoir. A concentrated magnetic field forms between the magnetic poles and the edge of the skimming blade. Some particles will be attracted to the edge of the blade and form a curtain that follows the concentrated magnetic field. This curtain acts as a skimmer which maintains a uniform layer on the sleeve. When the drum, with its latent image of positive charges, approaches the layer of toner on the revolving stainless-steel sleeve, the negatively charged particles are attracted to the drum, where they adhere to the positive charges on the surface. Thus, the electrostatic latent image on the drum becomes visible so that it can be transferred to a sheet of paper. Toner remaining on the stainless-steel developing sleeve after the image transfer is scraped off by the scraper and returned to the toner supply area of the developing assembly, where it circulates through the window in the scraper.



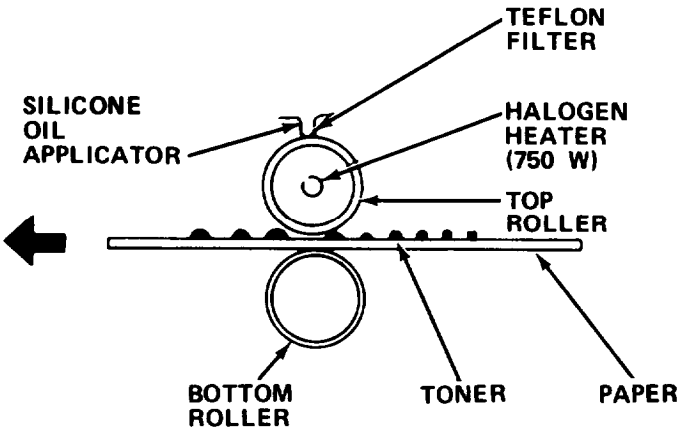
An ac bias voltage of 1 kV (peak to peak) at 0.4 kHz is applied to the developing **sleeve**. The voltage rises to +653 V, but falls to only -347 V (1.88:1 ratio). The reason is to assure distribution of toner proportional to the electrostatic latent image. Operation is based on the fact that unlike charges attract and like charges repel each other. The drum has a distribution of positive charges of about 600 V in image (dark) areas and negative charges in nonimage areas. Each toner particle has a negative charge. The developing sleeve bias varies continually from positive to negative to positive, so there is a continual variation in the electric field. Toner particles will adhere to positive charges on the drum, but a gap of 100 microns separates the drum from the layer of toner on the sleeve. When the sleeve is negative, toner particles are projected onto the drum and adhere to both light and dark areas. When the sleeve is positive, some of the particles on the dark areas and most of the particles on the light areas return to the sleeve. Because the sleeve voltage varies, dark areas are developed with toner particles and light areas remain clear of toner particles; thus, the light area remains free of fogging. The same bias is applied to the skimming blade so that there is no interference between blade and sleeve.

(6) Image transfer.

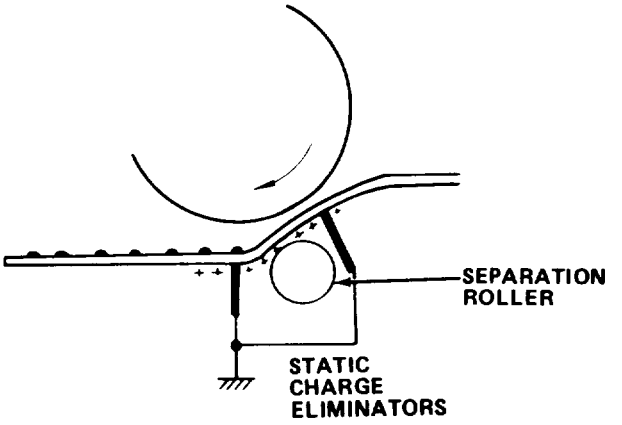


During the image transfer process, the toner image on the drum surface is transferred to the copy paper. A sheet of paper is brought into contact with the developer image, and a positive corona discharge is applied to the back of the sheet. This attracts the toner particles to the paper and holds the paper firmly to the drum surface. The paper with its adhering toner image is then separated from the drum and passed to the delivery belts, which transport it to the separation belt, a non-moving strip of thin plastic that holds a narrow strip of paper clear of the drum so that the paper can be removed readily, despite the strong attraction to the drum due to the charge on the back.

(7) Fixing.

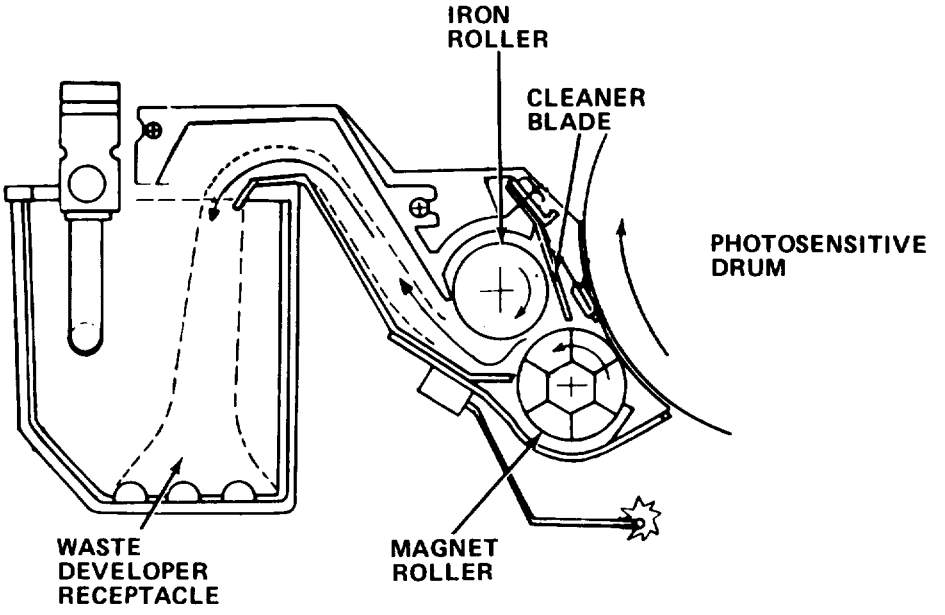


The purpose of the fixing stage is to permanently bond the toner image to the page. This is accomplished by passing the sheet of paper with its toner image between two heated rollers. The heat melts the resin of the developer, and the rollers press it on the page. The upper roller that contacts the developer is coated with slippery teflon to prevent developer from sticking to it. To keep the paper from sticking to the rollers, a very thin film of silicone oil is applied to the upper roller by a wick.



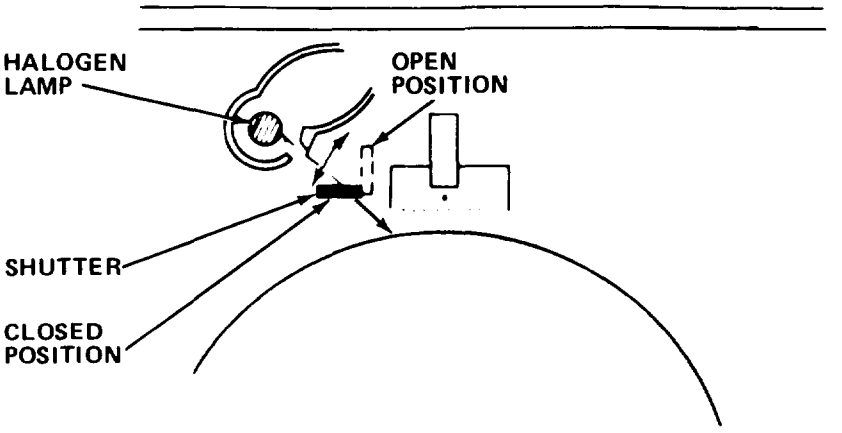
Copy materials with good insulating properties acquire a high static charge during the image transfer step. When the film is separated quickly from the drum by the separation belt, the distribution of this charge may change, disturbing the pattern of particles of the developed image on the other side. To prevent this, static charge eliminators are located before and after the transfer corona. The finished copy to be delivered contains a strong electric charge. The residual charge is removed through contact with a brush made of conductive carbon fibers at the delivery port.

(8) Drum cleaning.



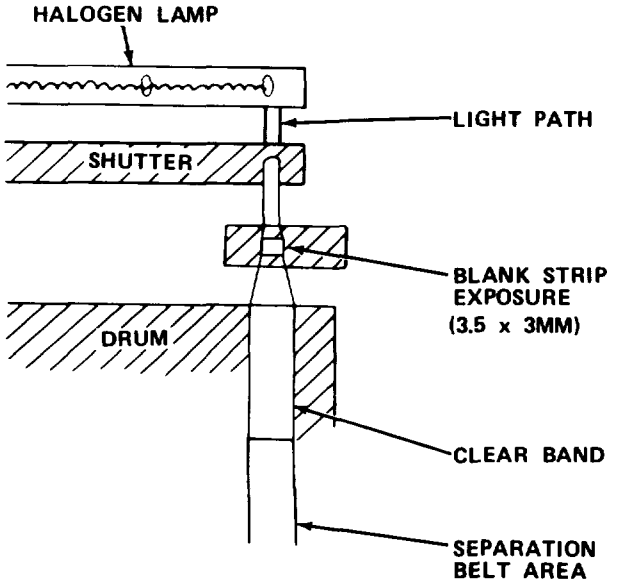
The purpose of the drum cleaning is to remove any developer powder that may remain on the drum before the next copy cycle. Any developer remaining on the drum is scraped off by the cleaner blade, and collected by a magnetic roller and iron roller. The toner removed is then pushed up to the waste developer receptacle.

b. Blank exposure.



Whenever the drum is rotating but a copy is not being scanned, the blank exposure shutter is opened to let light from the lamp illuminate the drum. This keeps the CdS resistivity low and prevents the buildup of positive charges on the surface. If there are no positive charges on the drum, developer will not be attracted to it. Thus, the drum is kept clean and developer waste minimized.

c. Blank strip exposure.

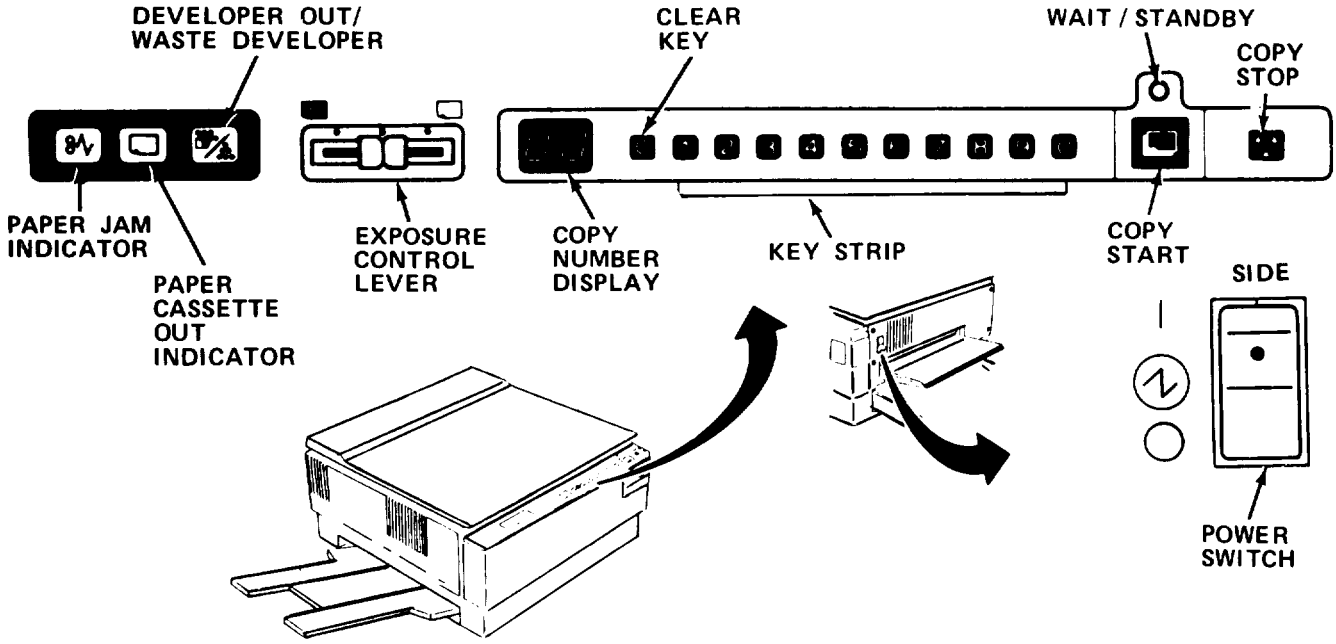


Whenever the drum is revolving, a narrow strip of the surface is illuminated by light from the halogen lamp that passes through the blank strip exposure window. This illuminates a band around the drum and keeps the band free of developer buildup even when the shutter is closed. This allows the separation belt to function properly.

Section II OPERATING INSTRUCTIONS

3-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.

CONTROL PANEL



Control or Indicator	Function
JAM Indicator	Lamp blinks if there is paper jam in copier or if top assembly is not completely closed.
PAPER/CASSETTE OUT Indicator	Lamp flashes if there is no paper in cassette or if there is no cassette in position.
Developer OUT/WASTE Developer Indicator	Blinks when developer container needs to be refilled or when waste developer needs to be emptied.
Exposure Control Lever	Makes copy lighter or darker.

Control or Indicator	Function
Copy Number Display	Displays desired number of copies as set via key strip. It counts down by one from total. After copy run is finished, it displays number of copies originally set. If COPY START key is not pressed within 30 sec of selecting number of copies, it returns to 1.
Key Strip/Clear Key	Press keys 1-0 to input number of copies required. (Maximum number of copies per run is 99.) Pressing clear key (C) returns number of copies to 1.
WAIT/STANDBY Indicator	Flashes when temperature of fuser roller is lower than required and copying is not possible (wait period). Afterward, it glows steadily to indicate that correct temperature has been reached (standby period).
COPY STOP Key	If pressed during continuous copy run, copying process is stopped after finishing copy in progress.
COPY START Key	Initiates copying process.
Power Switch NOTE Even with switch at O, some circuits are still active, so copier should be left plugged in.	All circuits in copier are activated only when this switch is set to 1. If there is no copying action or input via key strip for 30 rein, switch is automatically moved to O position by auto shutoff function. Switch should be reset to 1 to reactivate copier.

3-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

a. Before You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your before (B) PMCS.

b. While You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your during (D) PMCS.

c. After You Operate. Be sure to perform your after (A) PMCS.

d. If Your Equipment Fails to Operate. Troubleshoot with proper equipment. Report any deficiencies using the proper forms. See DA Pam 738-750.

3-5.1 PMCS Procedures.

a. PMCS are designed to keep the equipment in good working condition by performing periodic service tasks.

b. Service intervals provide you, the operator, with time schedules that determine when to perform specified service tasks.

c. The "Equipment is Not Ready/Available If" column is used for identification of conditions that make the equipment not ready/available for readiness reporting purposes or denies use of the equipment until corrective maintenance is performed.

d. If your equipment fails to operate after PMCS is performed, immediately report this condition to your supervisor.

e. Perform weekly as well as before operation if you are the assigned operator and have not operated the item since the last weekly or if you are operating the item for the first time.

f. Item number column. Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your "TM Number" column on DA Form 2404, Equipment Inspection and Maintenance Worksheet in recording results of PMCS.

g. Interval columns. This column determines the time period designated to perform your PMCS.

h. Item to be inspected and procedures column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation Chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.

i. Equipment is not ready/available if: column. This column indicates the reason or cause why your equipment is not ready/available to perform its primary mission.

j. List of tools and materials required for PMCS is as follows:

Item	Quantity
Cheesecloth (Item 7, Appendix E)	ar
Denatured Alcohol (Item 4, Appendix E)	ar

Table 3-2. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can safely be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

B - Before, D - During, A - After | W - Weekly, M - Monthly, Q - Quarterly | AN - Annually, S - Semiannually, BI - Biennially | (Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PLAIN PAPER COPIER	
1	B	Inspect Copier.	
		1. Unplug power cord.	
		2. Inspect power cord for broken insulation, kinks, cracked plug, and cuts.	Power cord defective.
		3. Check that there is no debris in paper discharge area.	Debris in paper discharge area.
		4. Check that copier is not near sources of heat or humidity.	Copier is near a source of heat and/ or humidity.
		5. Inspect copier support to be sure it is level.	Copier is not level.
		6. Check that copier has room for platen movement and cassette loading.	Copier does not have enough room for platen movement or cassette loading.
		7. Plug in power cord.	

Table 3-2. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After | W - Weekly M - Monthly Q - Quarterly | AN - Annually S - Semiannually BI - Biennially | (Number) - Hundreds of Hours

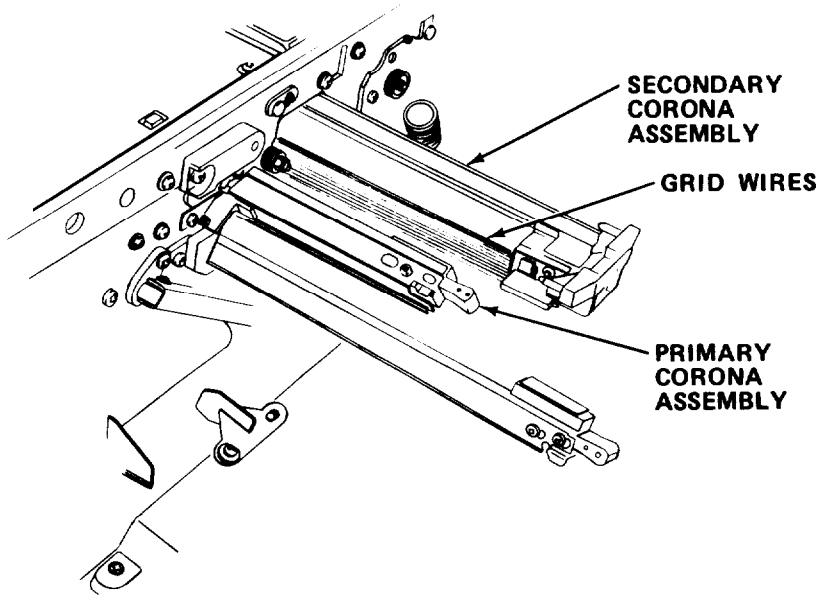
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PLAIN PAPER COPIER - Cont	
2	W	Service Coronas. **WARNING** Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing. 1. Unplug power cord. 2. Open front door.  3. Carefully remove the primary and secondary corona assemblies. Using cheesecloth dampened with denatured alcohol, clean each corona wire and the grid wires of the secondary corona. Wipe off all excess alcohol from wires. 4. Reinstall primary and secondary coronas and close front door. 5. Plug in power cord.	Corona or grid wire broken.

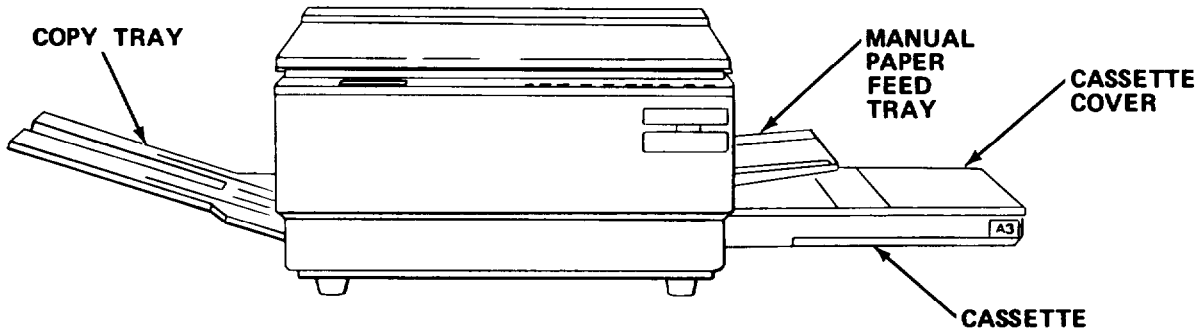
Table 3-2. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After | W - Weekly M - Monthly Q - Quarterly | AN - Annually S - Semiannually BI - Biennially | (Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PLAIN PAPER COPIER - Cont	
3	W	Clean Copyboard Glass. Raise the copyboard cover. Using a damp cheesecloth, clean both sides of the glass moving the platen to the right or left as necessary. Dry off excess moisture with dry cheesecloth.	Copyboard glass broken.
4	W	Clean Copyboard Cover. Raise the copyboard cover and clean the underside with a damp cheesecloth, then wipe with a dry cheesecloth.	
5	W	Clean Copier. Using a damp cheesecloth, clean all exterior surfaces of the copy machine.	

3-6. OPERATION UNDER USUAL CONDITIONS.

3-6.1 Assembly and Preparation for Use.



a. Attach copy tray.

b. Attach manual paper feed tray.

c. Check that power cord is plugged into electrical outlet.

d. Slightly lift cassette and pull it out of copier.

e. Remove cassette cover and fill with 8.5 in. X 11 in. (21.6 cm x 27.9 cm) paper.

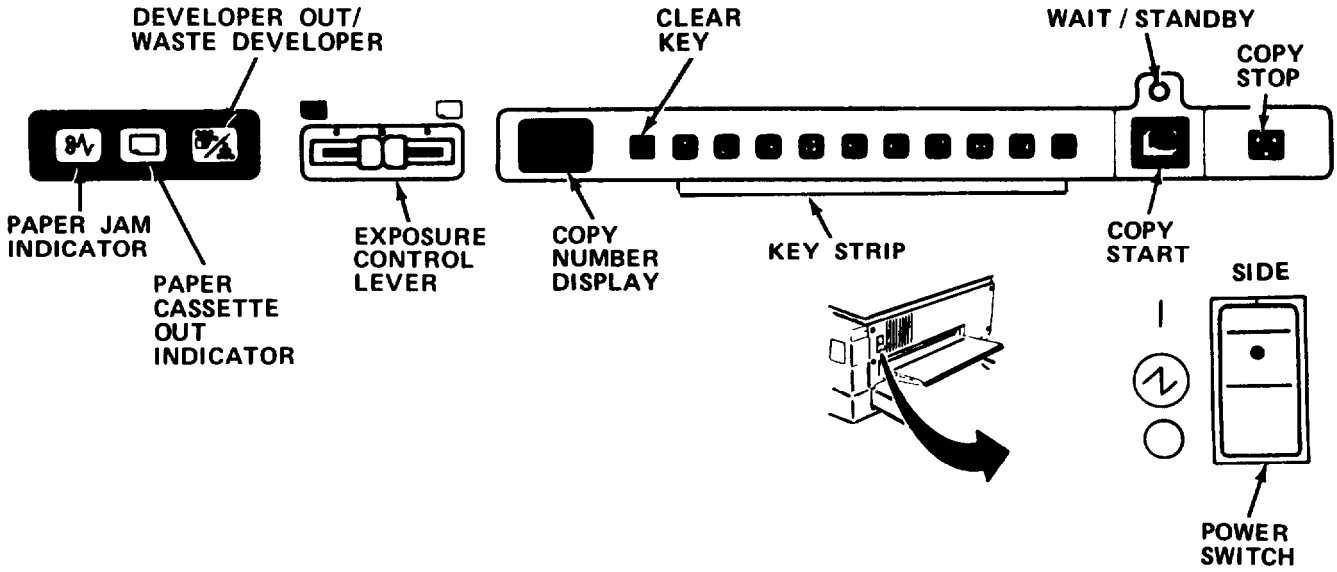
f. Reinstall cassette cover.

3-6.2 Operation Procedures.

NOTE

- Copier remains in wait mode for approximately 3 min after it is switched **on.** WAIT/STANDBY indicator flashes if fuser roller is below 356°F (180°C). Copying is not possible during this time.
- Standby mode is reached when fuser roller reaches 356°F (180°C). WAIT/STANDBY indicator glows steadily.

CONTROL PANEL



a. Set power switch to 1 (ON).

(1) WAIT/STANDBY indicator flashes.

(2) Copy number display indicates 1.

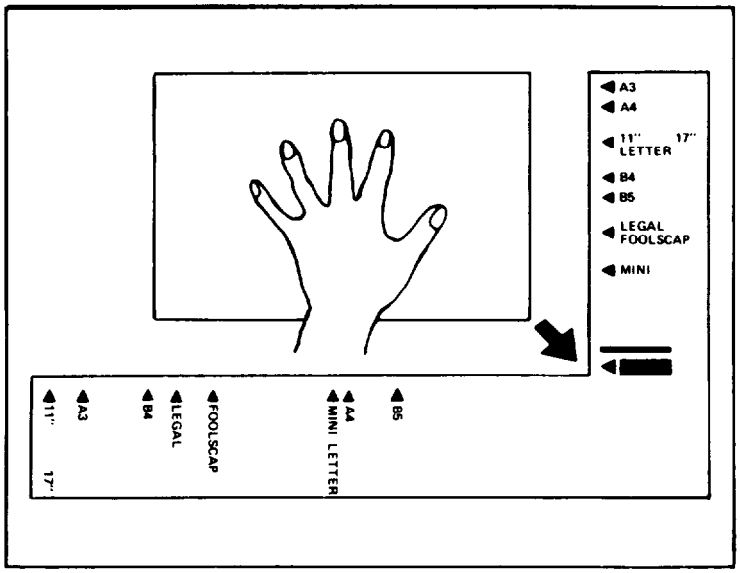
b. If developer OUT/WASTE developer indicator flashes, refer to paragraphs 3-6.2.1 and 3-6.2.2.

c. If JAM indicator flashes, refer to paragraph 3-6.2.3.

d. Select copy quantity 2. Copy number display should display 2. Press CLEAR key. Copy number display should display 1. Repeat procedure for copy quantities 3 thru 10.

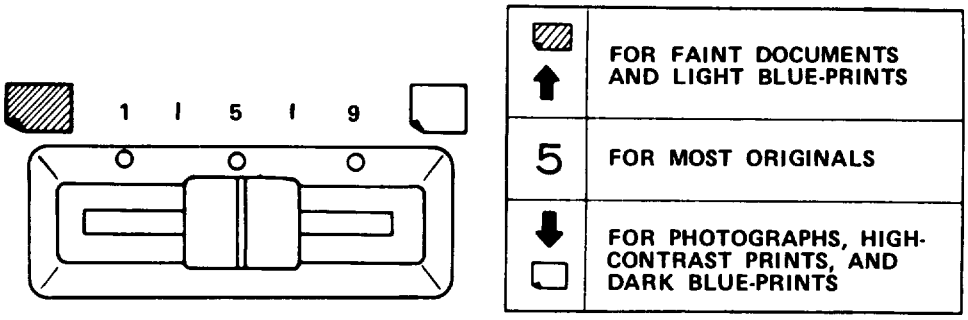
NOTE

Strip 2.75 in. ± 0.2 in. (6.99 cm ± .51 cm) wide at bottom is not reproduced.



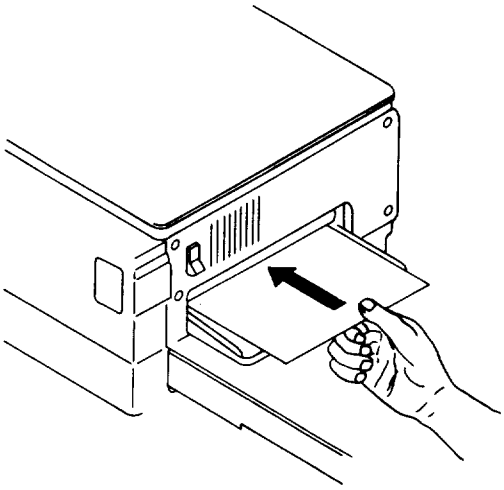
e. Raise copyboard cover and place original on glass facing downward. Make sure it lies within size index marks.

f. Move exposure control lever to be sure that it moves smoothly.



g. Set exposure control lever according to image density (contrast) of original.

h. If manual paper feed is to be used, proceed to step i. If cassette feed is to be used, proceed to step n.



NOTE

. Improper alinement of copy paper with guide can cause paper to jam.

- **Copy** paper will be drawn into copier 1.5 sec after its insertion. Hold paper lightly so that it cannot fall from guide.
- Paper sizes that can be fed manually range from 5.1 in. X 7.2 in. (12.95 cm X 18.3 cm) to 11.7 in. X 16.5 in. (29.7 cm X 41.9 cm). Original cannot exceed size of copy paper.

i. Check that surface onto which copy will be made faces upward.

j. Aline copy paper square with manual paper guide and feed in.

k. Copying process has begun.

1. If additional copies of same original are desired, repeat steps i thru k.

m. If additional copies are desired of another original, repeat steps e thru k.

NOTE

- Set number of copies will be made automatically.
- Number of copies selected cannot be changed by pressing CLEAR key or key strip until copier completes cycle for copy in progress or while JAM indicator is flashing.
- Multiple-copy run can be interrupted at any time by pressing COPY STOP key. It stops after completing copy in progress. When copier stops, copy number display indicates number of copies initially set. Repressing COPY START key continues process to finish number of copies originally set.
- If copying is not initiated within 30 seconds of pressing key strip to set required number of copies or after end of copy run, copy number display will be cleared to 1.

q. Press COPY START key. Copier will start and run until required number of copies are completed.

r. Raise platen cover and remove original.

NOTE

About 30 minutes after copying operation or key strip input, auto shutoff mechanism functions to move power switch to O (OFF).

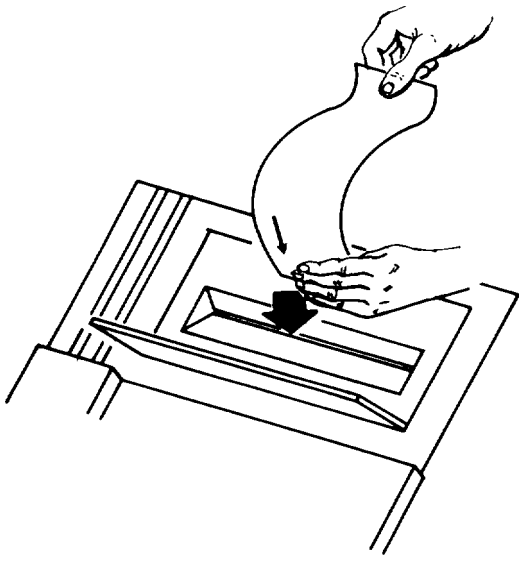
s. Set power switch to O (OFF).

3-6.2.1 Replacing Developer.

a. Turn power switch to O (OFF).

b. Shift platen to left.

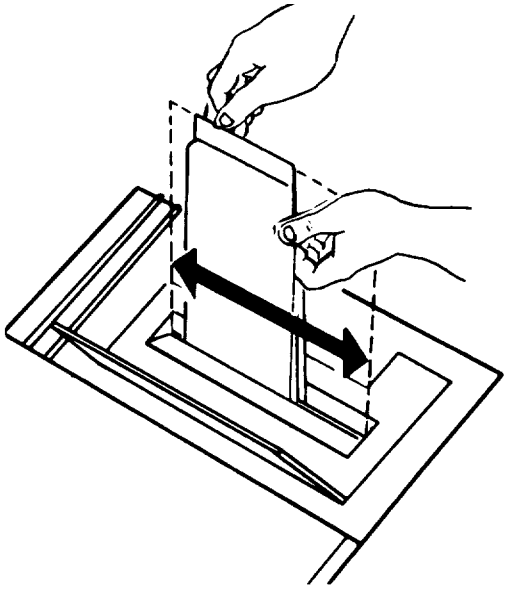
c. Raise lid of developer hopper.



d. Shake bag so that its contents drop to bottom of bag.

e. Cut off top of bag with scissors.

f. Pinch top closed and insert neck of bag in filling slot until arrow mark on bag disappears.



g. Pour developer into hopper, moving bag back and forth to distribute developer evenly.

NOTE

- Developer scattered around filling slot must be cleaned up.
- Use only one bag to refill developer hopper.

h. When developer hopper is full, pinch neck to prevent spillage and withdraw bag.

i. Gently close hopper lid.

j. Shift platen to home position.

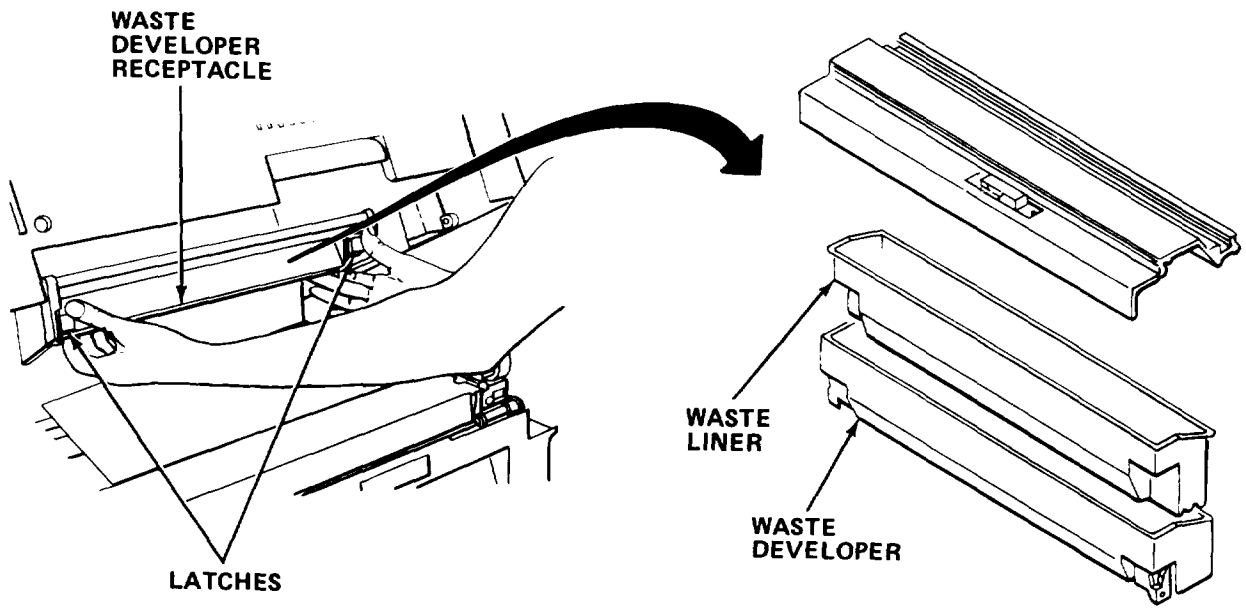
3-6.2.2 Removing Waste Developer.

a. Turn power switch to O (OFF).

b. Shift platen to right.

c. Pull opening latch on left side and raise upper assembly.

d. Place sheet of copy paper under delivery area to prevent spilling developer inside copier.



e. Press both latches of cleaner assembly to disengage waste developer receptacle.

f. Remove liner containing waste developer and discard.

g. Install new liner in waste developer receptacle.

CAUTION

If vacuum cleaner is used to clean out the developer assembly or the cleaner assembly, do not let the vacuum cleaner contact the CdS cell as it will damage the CdS cell.

NOTE

Clean the light tube and the CdS cell with cheesecloth.

h. Reinstall waste developer receptacle in copier.

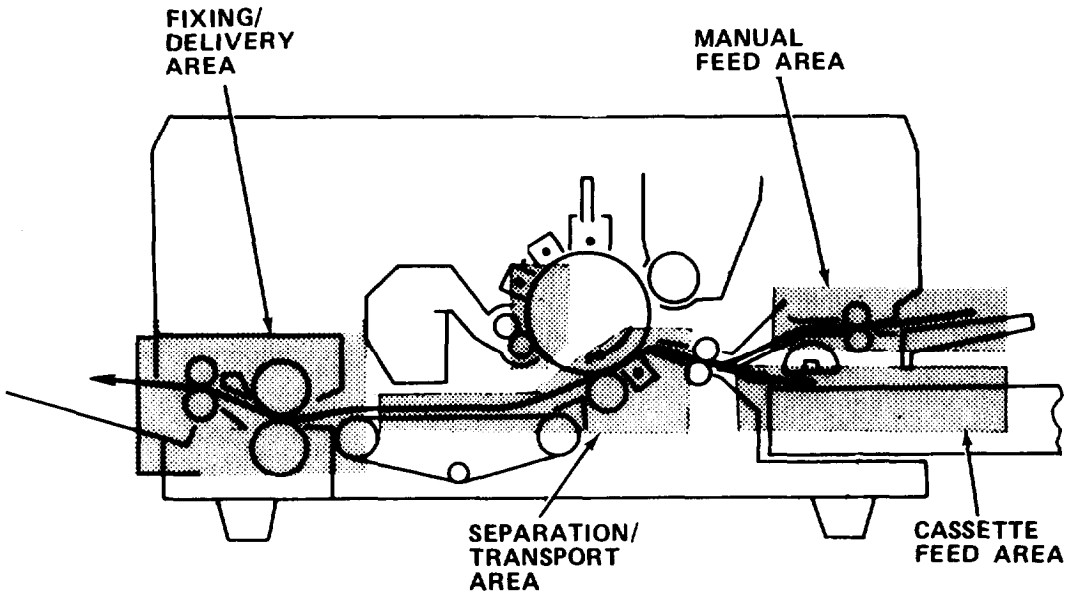
NOTE

JAM indicator will blink if upper assembly is not locked correctly.

i. Lower upper assembly and press down with both hands.

j. Return platen to home position.

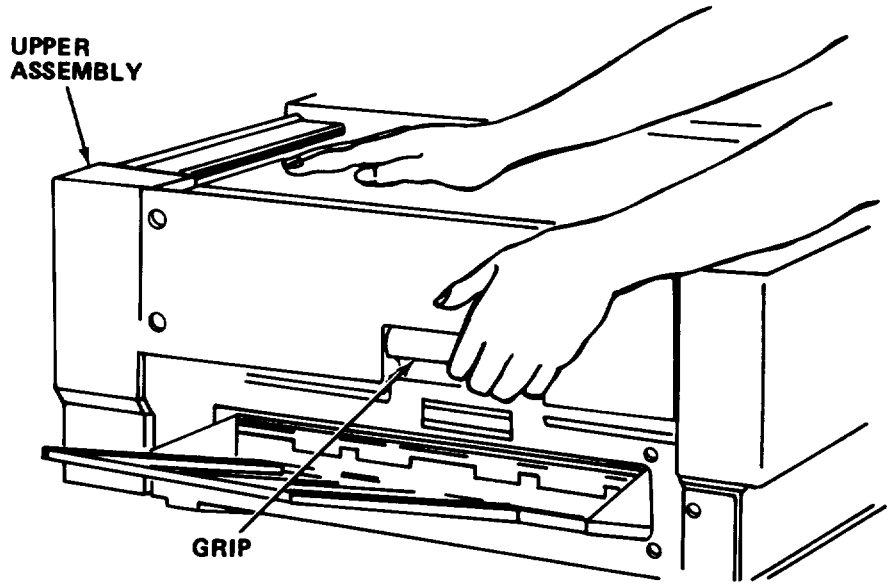
3-6.2.3 Clear Paper Jam.



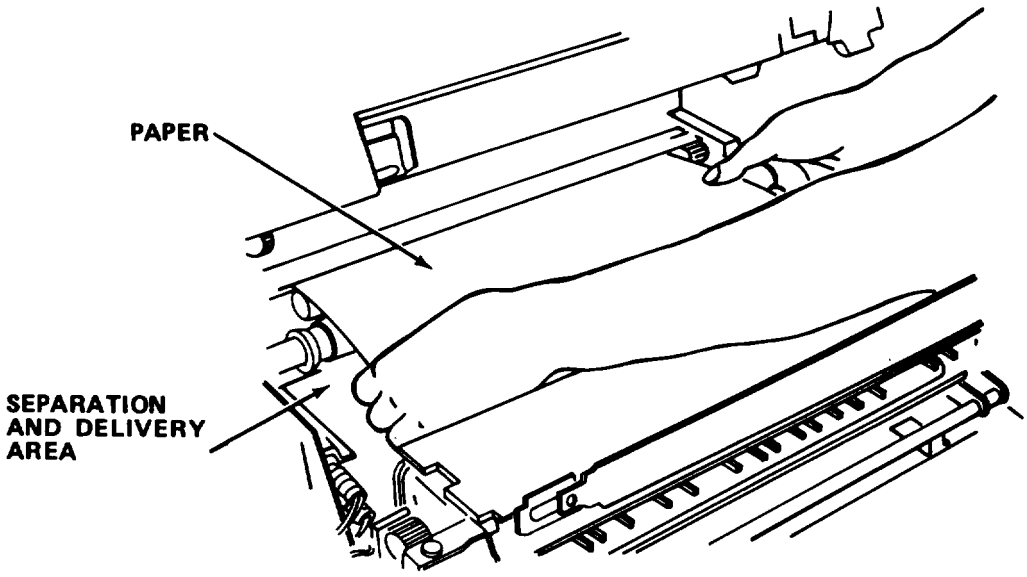
NOTE

If JAM indicator flashes during copy run, remaining number of copies will be displayed on copy number display. Copy number display returns to 1 when jammed paper is removed. Paper jams usually occur at one of five locations, except with multiple copy runs, when jam is likely to overlap two adjacent areas. JAM indicator blinks if upper assembly is not locked correctly.

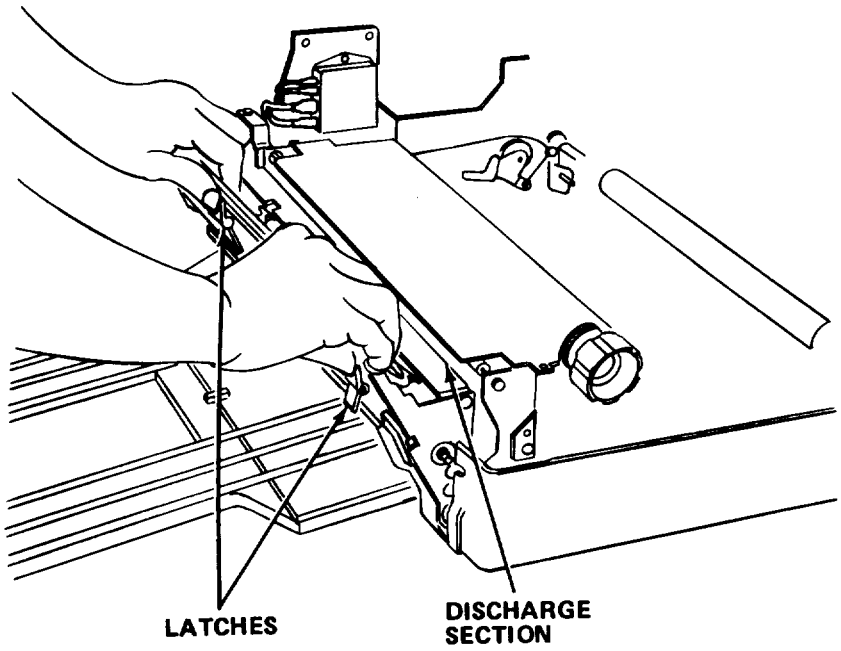
a. Turn power switch to O (OFF) and shift platen to right.



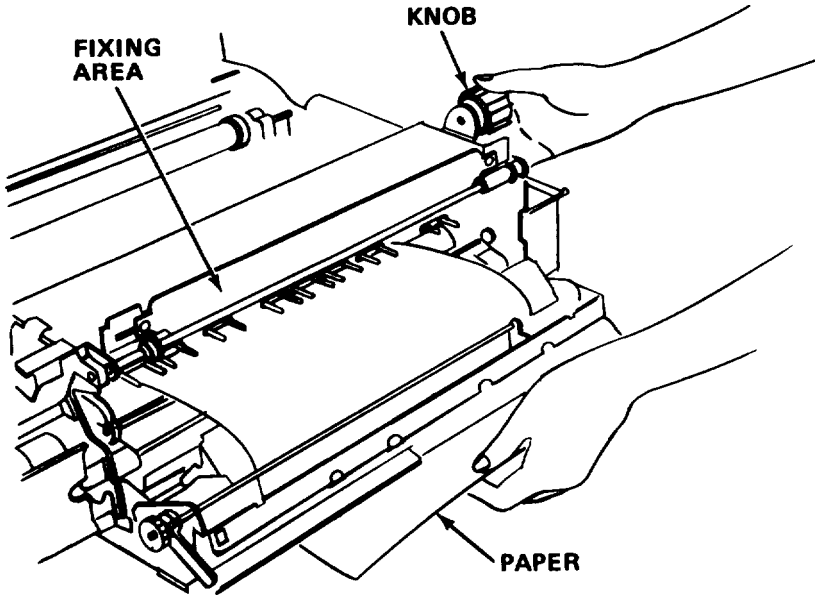
b. Lift opening grip and gently raise upper assembly to full open position.



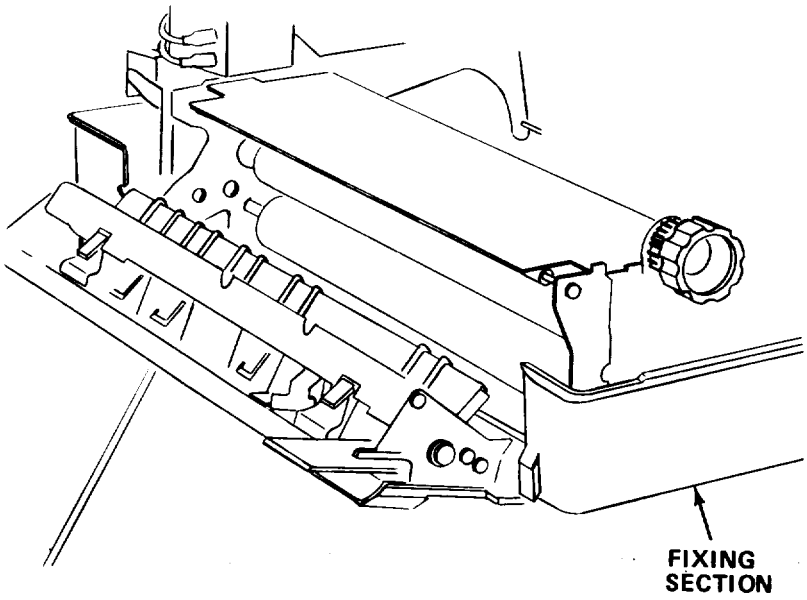
c. If paper is jammed at separation/delivery area, gently pull it out without tearing.



d. If paper Is jammed at fixing/outlet area, press two latches and lower discharge section.



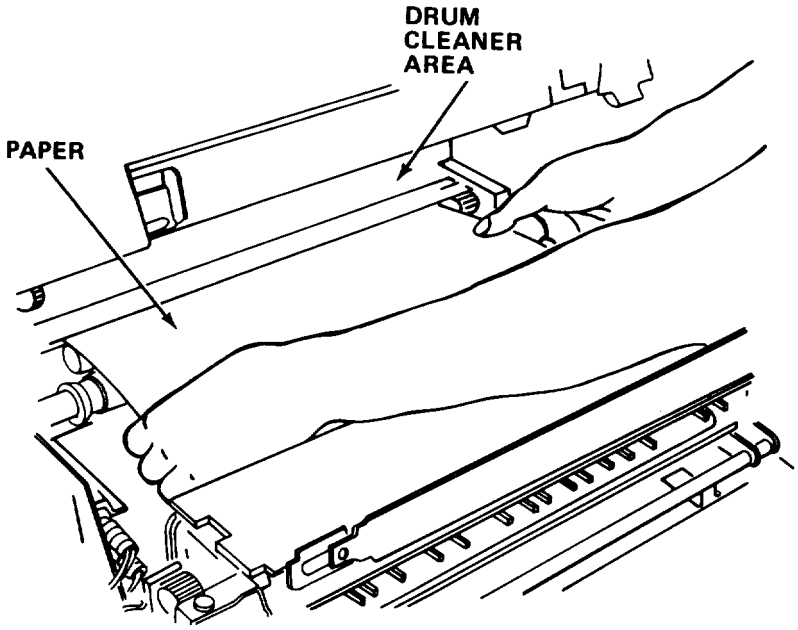
e. Rotate knob at ends of fixing area and remove jammed paper.



f. Check that no paper is left jammed in copier. Raise fixing section so that it latches.

NOTE

If paper is jammed around cleaner area, before pulling paper out, release cleaner assembly and then remove jammed paper.



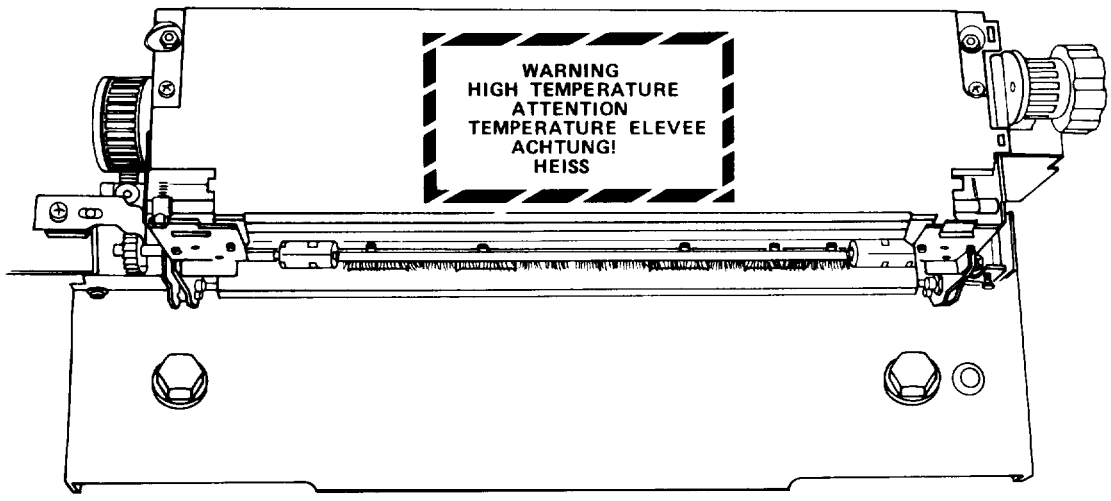
g. If paper is jammed at drum cleaner area, place sheet of paper under cleaner and gently remove jammed paper. Be careful not to tear it.

h. Pull out cassette to check paper pickup area.

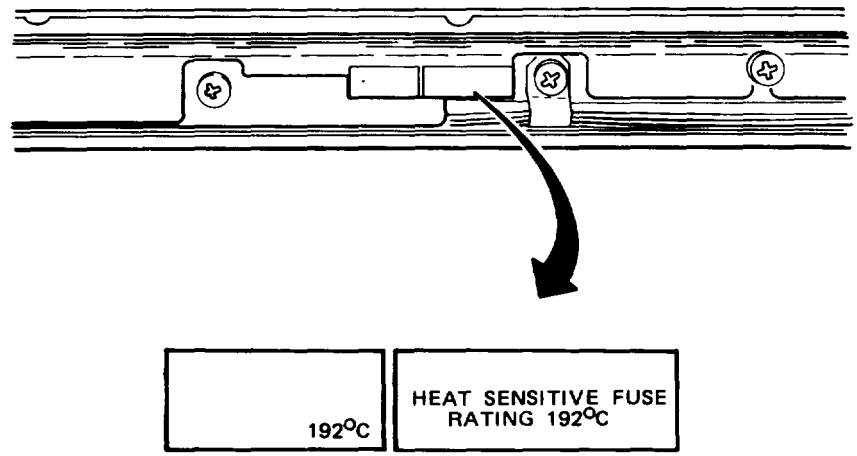
i. Check manual paper pickup area.

j. Lower upper assembly and press it down with both hands until it latches securely.

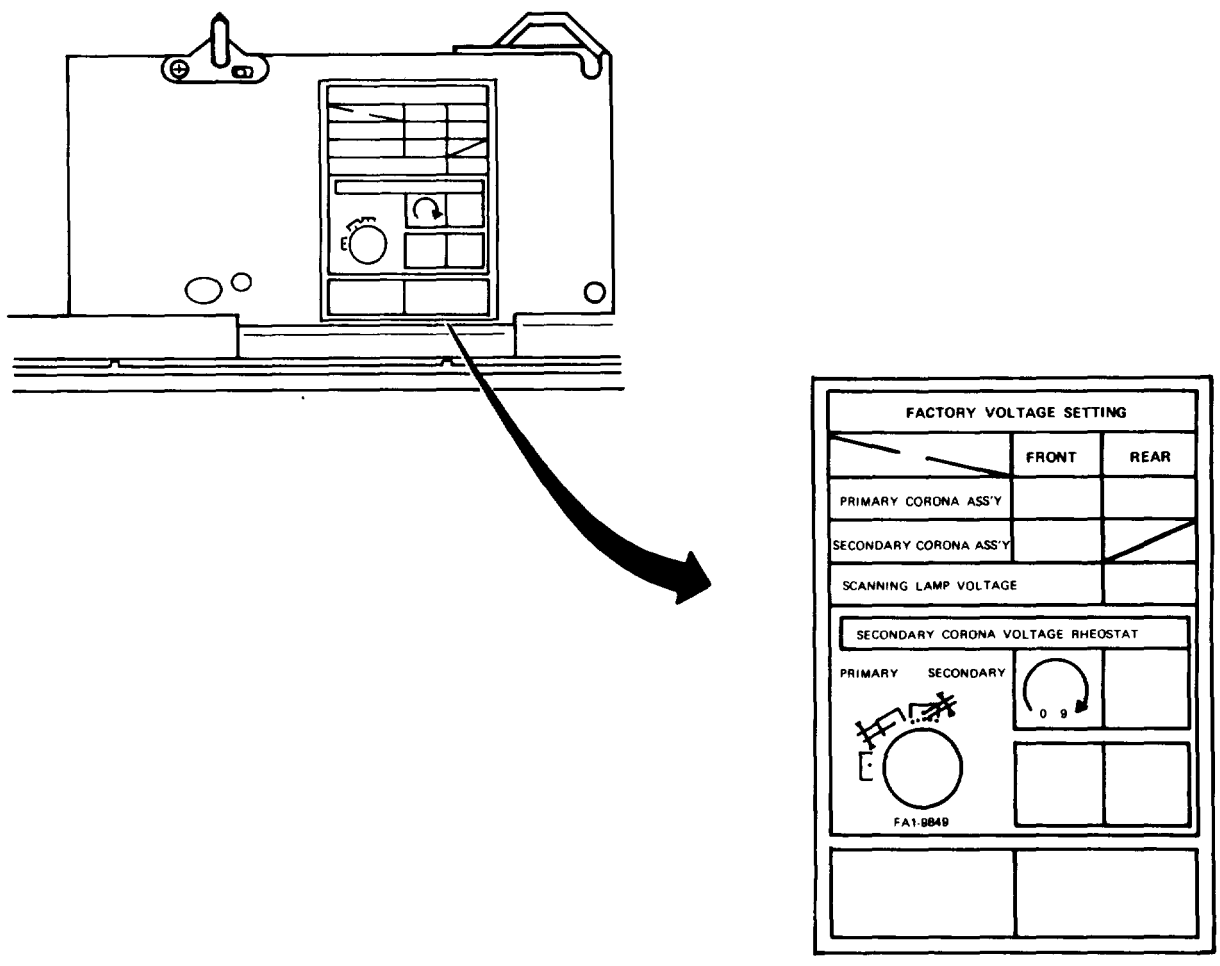
3-6.3 Operating Instructions on Decals and Instruction Plates.



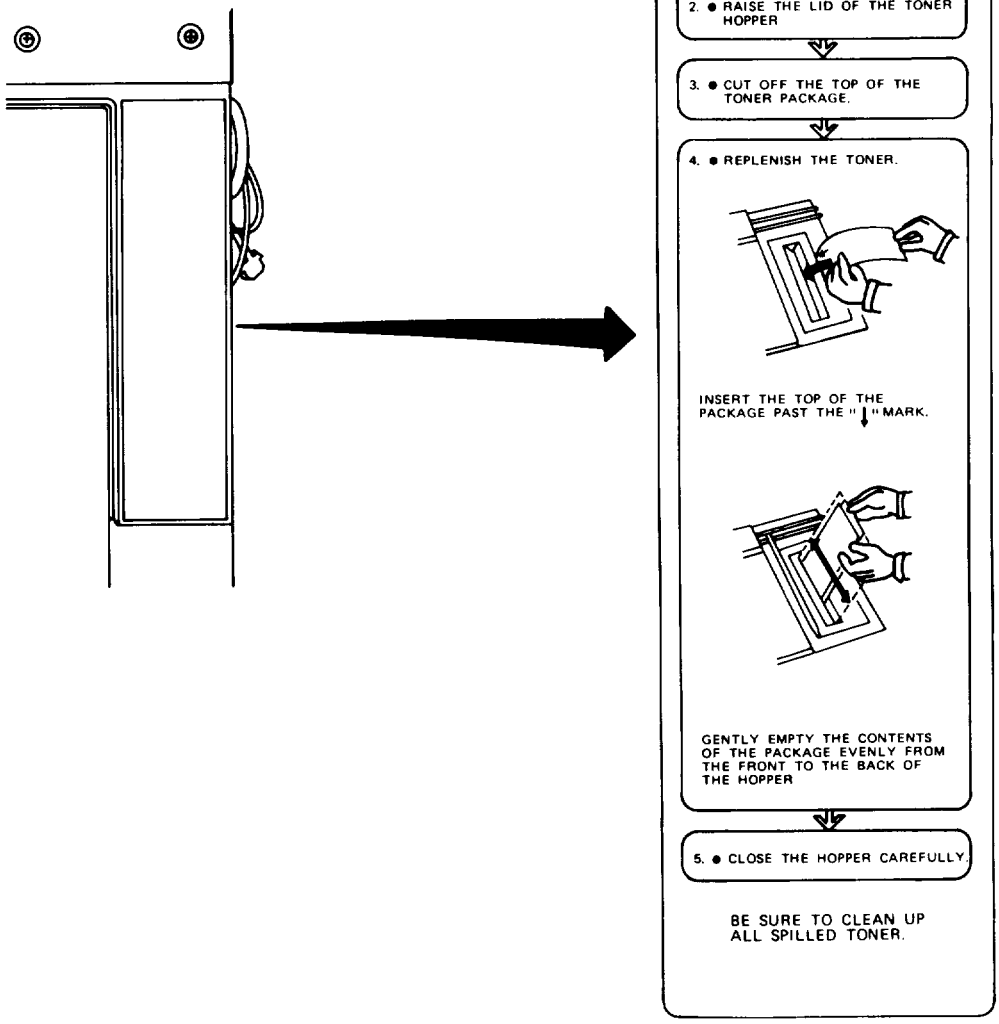
This WARNING is located on the cover of the fixing unit.



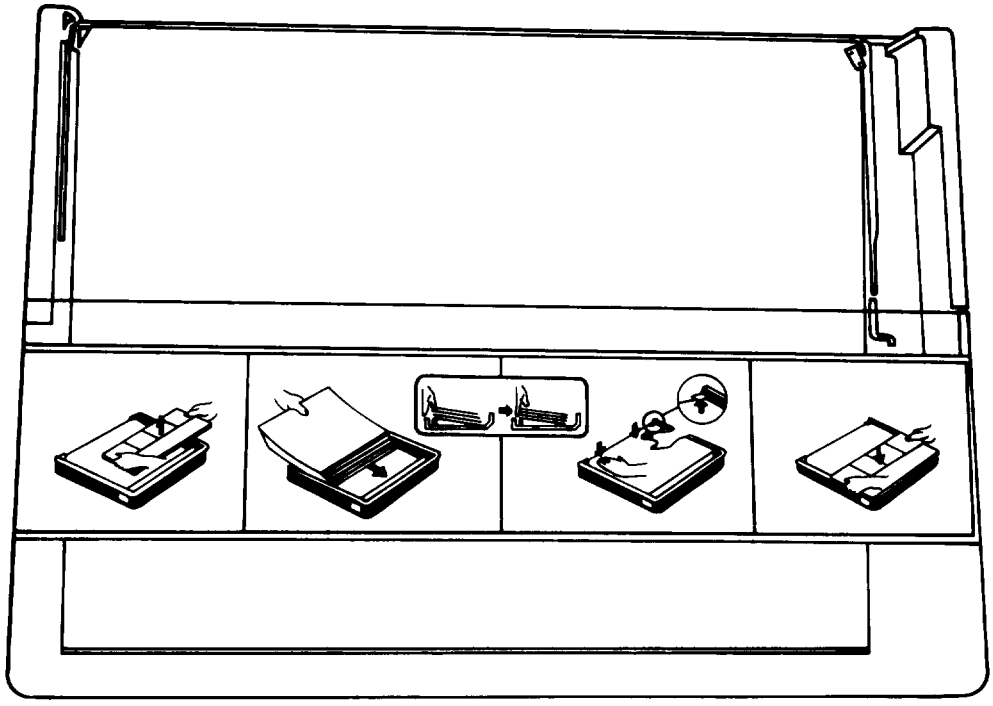
This tag is located next to thermal fuse under the top left panel.



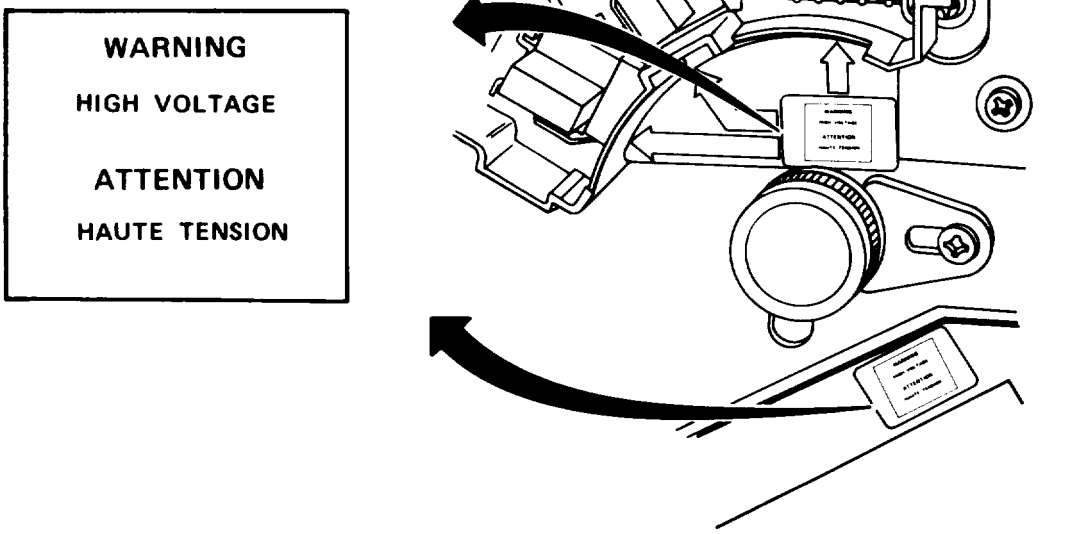
This decal is located on the inside of the front door.



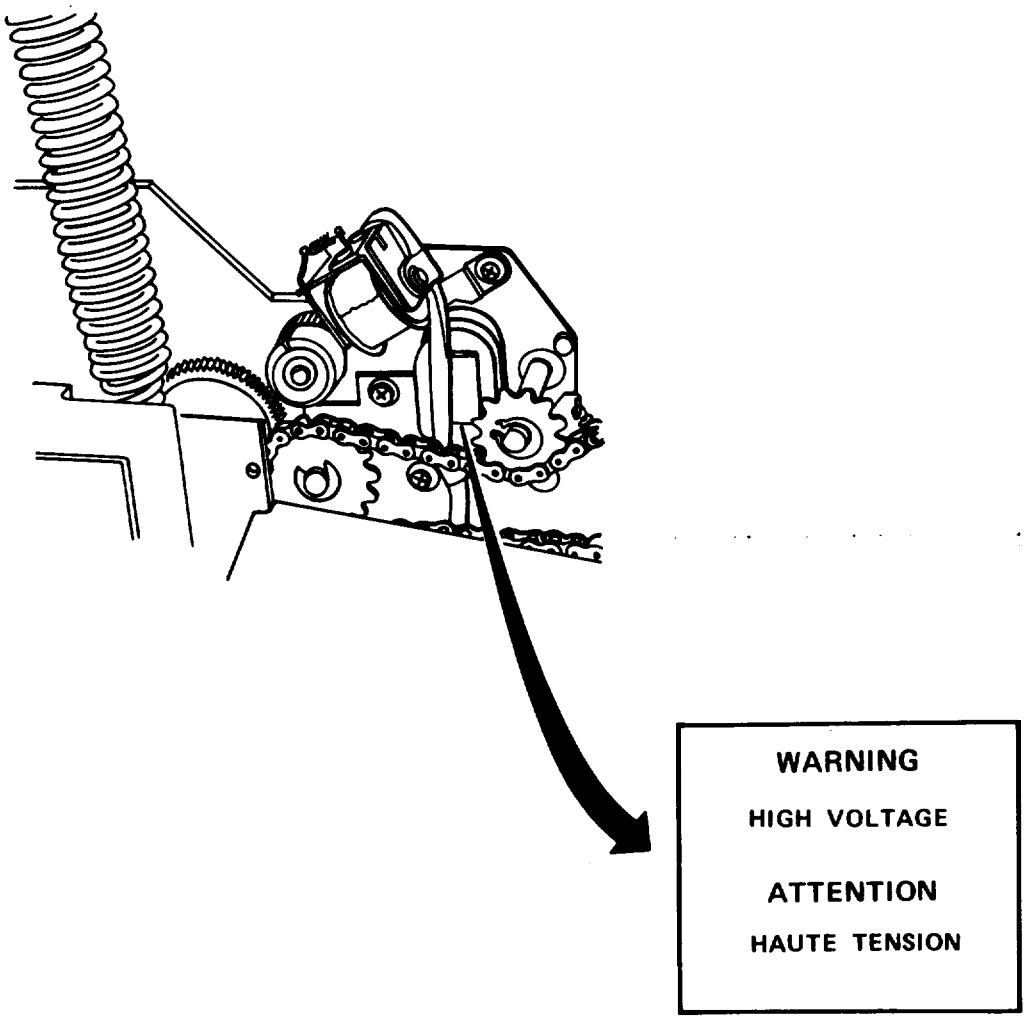
This instruction plate is located on the top right panel.



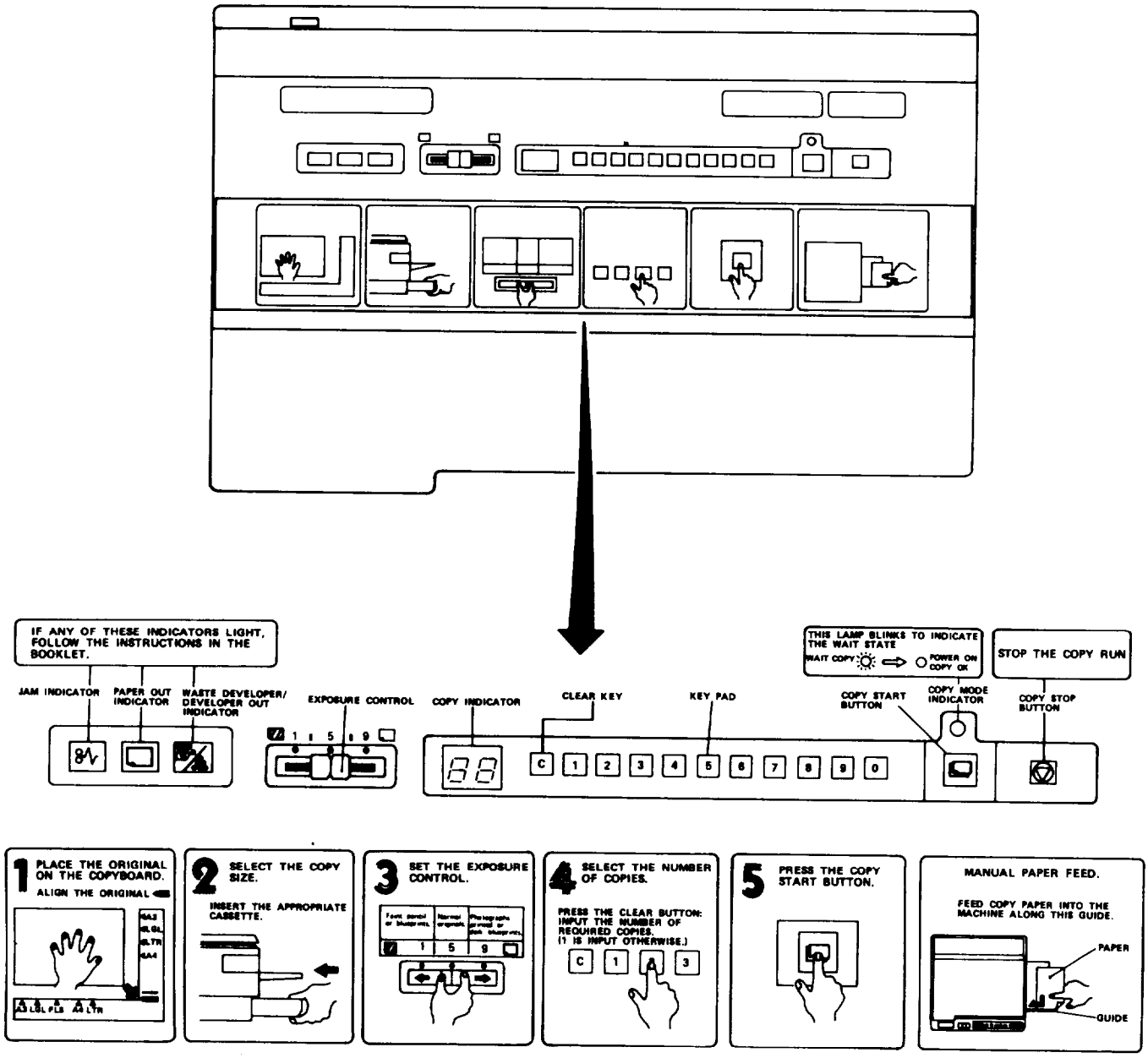
This instruction plate is located on the paper cassette.



These decals are located behind front cover next to the corona assemblies.



This decal is located on rear end of corona assembly behind upper and lower rear panels.



This instruction label is located on the copier outer cover.

3-7. OPERATION UNDER UNUSUAL CONDITIONS. This equipment is designed for operation only in a controlled environment.

Section III OPERATOR MAINTENANCE

3-8. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication at this level of maintenance.

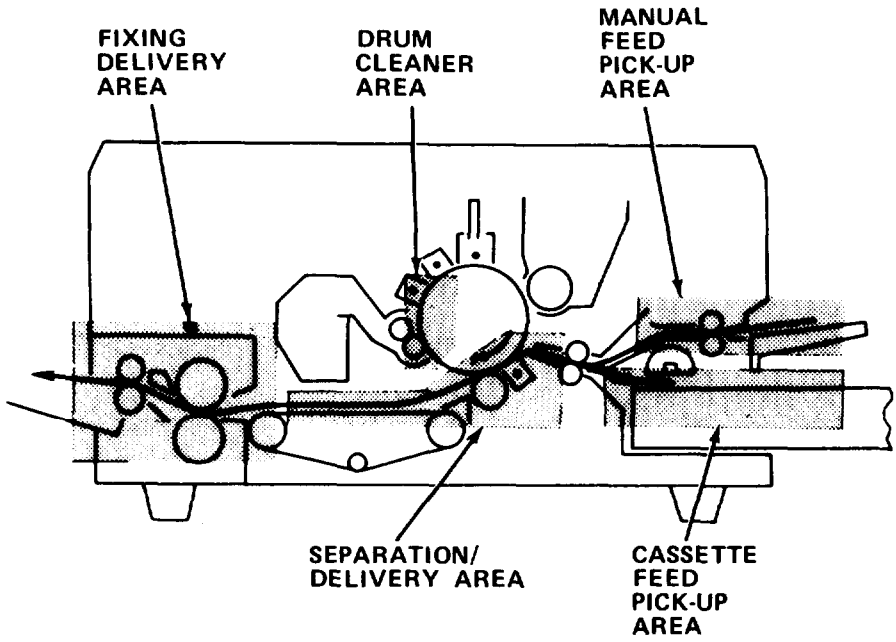
3-9. TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during the operation or maintenance of the plain paper copier, or its components. You should perform the test/inspections and corrective actions in the order listed.

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

Table 3-3. TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION



1. JAM INDICATOR FLASHES DURING COPY RUN.

Paper jam has occurred in one of five locations.

Remove paper jam (paragraph 3-6.2.3).

Table 3-3. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
2. PAPER/CASSETTE OUT INDICATOR FLASHES .	
No paper in cassette.	(a) Refill cassette with proper size paper. (b) Refer to direct/general support maintenance.
3. DEVELOPER OUT/WASTE DEVELOPER INDICATOR FLASHES.	
Step 1. Waste developer receptacle is full.	Empty waste developer receptacle.
Step 2. Developer hopper contents are low.	Refill developer hopper.
4. WAIT/STANDBY INDICATOR DOES NOT FLASH AFTER POWER SWITCH IS PLACED TO 1.	
Step 1. Front door is not closed.	Close front door.
Step 2. Upper assembly is not closed.	Lower upper assembly using both hands and press it down firmly until it latches.
Step 3. Power cord not plugged in.	(a) Set power switch to OFF. Plug in power cord and turn on machine. (b) If still not flashing, refer to direct/general support maintenance.

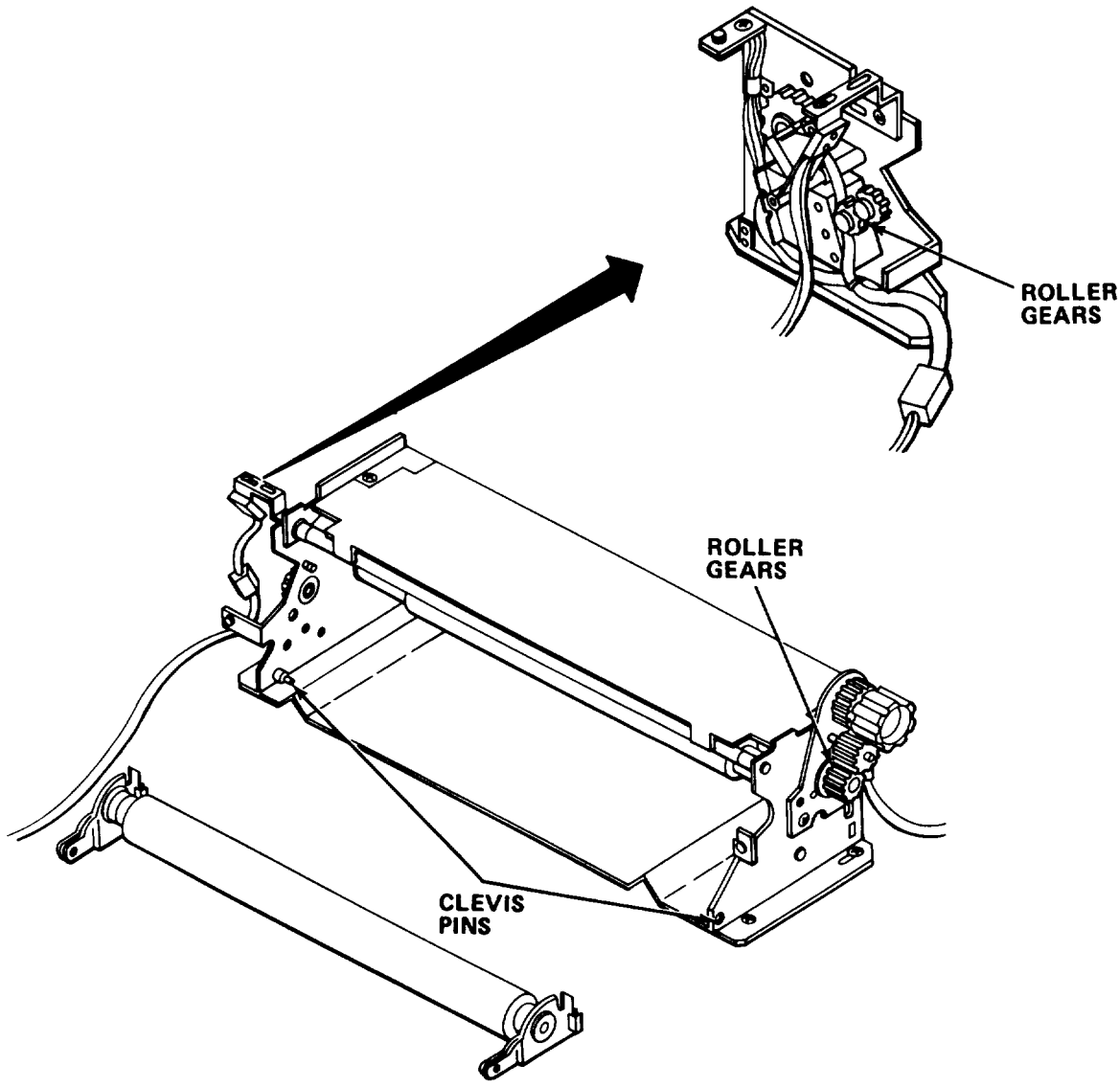
3-10. MAINTENANCE PROCEDURES. There are no assigned operator maintenance tasks for this equipment.

Section IV ORGANIZATIONAL MAINTENANCE

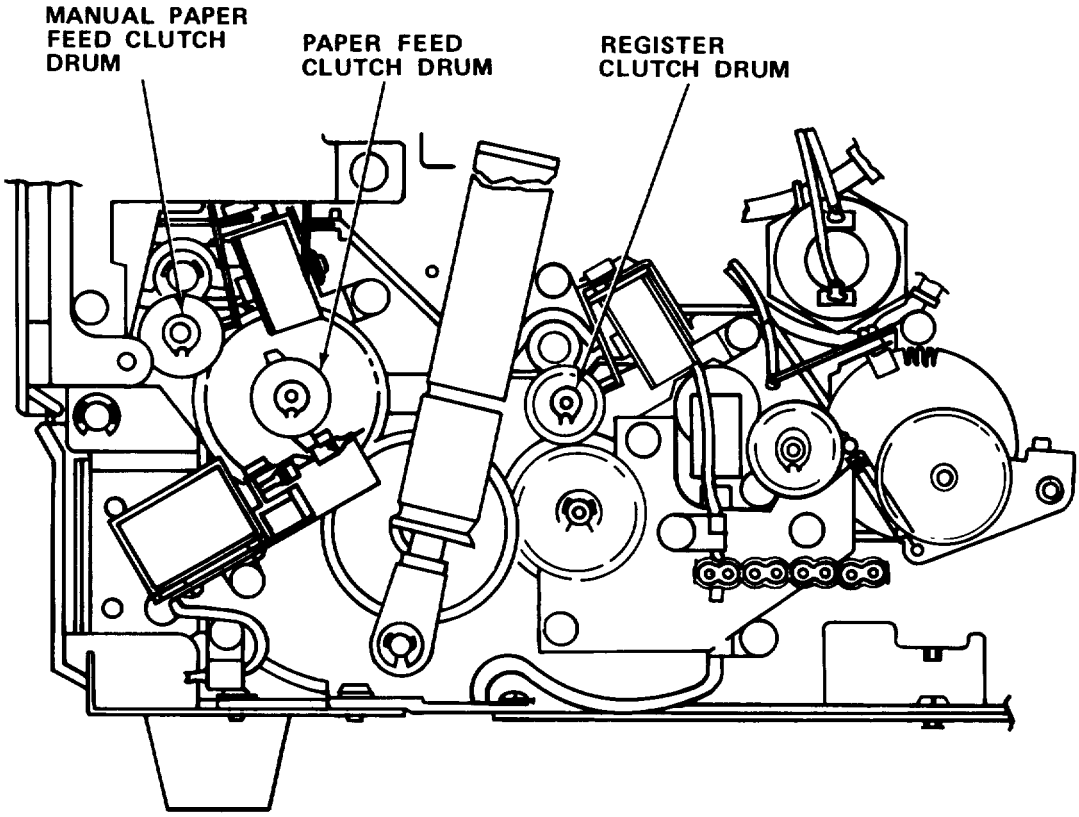
3-11. LUBRICATION INSTRUCTIONS.

NOTE

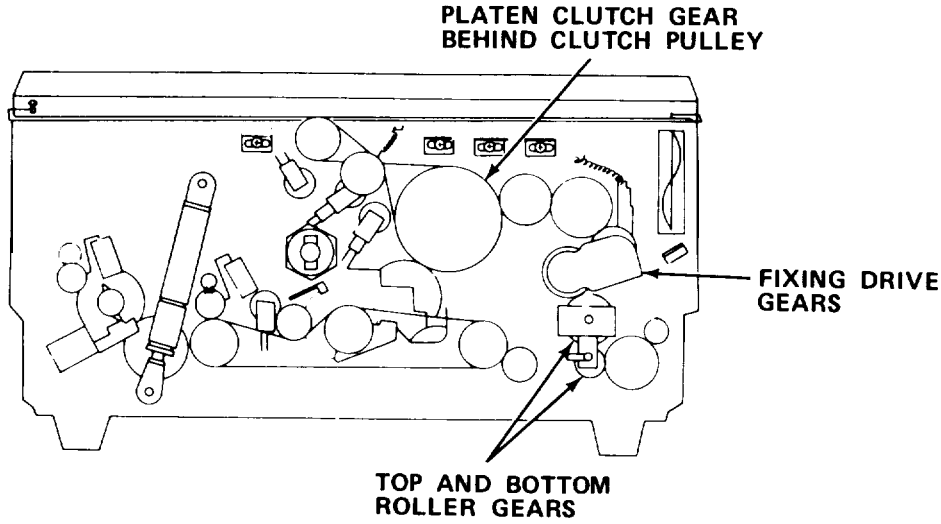
These lubrication instructions are mandatory.



Semiannually- grease the fixing roller gears, clevis pins, contact surfaces, and paper discharge unit with heat resistant grease, MIL-G-81322 (Item 13, Appendix E).



b. Annually - lubricate spring of each clutch drum with lubricating oil (Item 14, Appendix E).



c. Biennially - grease platen clutch gear, fixing drive gears, and top and bottom roller gears with heat resistant grease, MIL-G-81322 (Item 13, Appendix E).

3-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE] ; AND SUPPORT EQUIPMENT.

3-1.2.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

3-12.2 Special Tools: Test, Measurement, and Diagnostic Equipment; and Support Equipment. Special Tools, TMDE, and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.

3-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-6675-324-24P covering organizational maintenance for this equipment.

3-13. SERVICE UPON RECEIPT.

3-13.1 Checking Unpacked Equipment.

Inspect the equipment for damage incurred during shipment.. If equipment has been damaged, report the damage on DD Form 6, Packing Improvement Report.

b. Check the equipment against the packing list to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

c. Check to see whether the equipment has been modified.

3-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

a. PMCS are designed to keep the equipment in good working condition by performing certain tests, inspections, and services. The intervals provide you, the organizational technician, with time schedules that determine when to perform specified tasks.

b. Item number column. Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your "TM Number" column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording the results of PMCS.

Interval columns. This column determines the time period designated to perform your PMCS.

d. Item to be inspected and procedures column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation Chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.

e. List of tools and materials required for PMCS is as follows:

Item	Quantity
Multimeter	1 ea
Electrical Hookup Wire (20 Gage)	ar
Copy Paper (8.5 in. x 11 in.)	ar
NA Test Sheet	1 ea
Cheesecloth (Item 7, Appendix E)	ar
Denatured Alcohol (Item 4, Appendix E)	ar
Drum Cleaning Powder (Item 10, Appendix E)	ar
Lens Tissue (Item 30, Appendix E)	ar
Silicone Oil S-200 (Item 16, Appendix E)	ar
Paper Towels (Item 20, Appendix E)	ar
Waste Developer Receptacle	1 ea
Flashlight	1 ea
Machinist's Rule, 6“	1 ea
Spring Gauge, 0-1500 grams	1 ea
Grip Ring Pliers (small, reed, large)	1 ea
Pliers, Needle Nose	1 ea
Pliers, Slip Joint	1 ea
Pliers, Duckbill	1 ea
Spring Hook	1 ea
Metric Hex Head Key Wrench Set	1 ea
Metric 1/4 in. Drive Socket Set	1 ea
Metric Open End Wrench Set	1 ea
Flat Tip Screwdriver Set	1 ea
Cross Tip Screwdriver Set	1 ea

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can safely be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

B - Before
D - During
A - fter

W - Weekly
M- Monthly
Q- Quarterly

AN - Annually
S - Semiannually
Bl - Biennially

(Number) . Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER
1	M	Service Fiber Lens Array.
		WARNING
		Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.
		1. Unplug power cord.
		CAUTION
		Top, bottom, and upper sides of lens array are coated with conductive material. Do not clean it using water or solvent.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

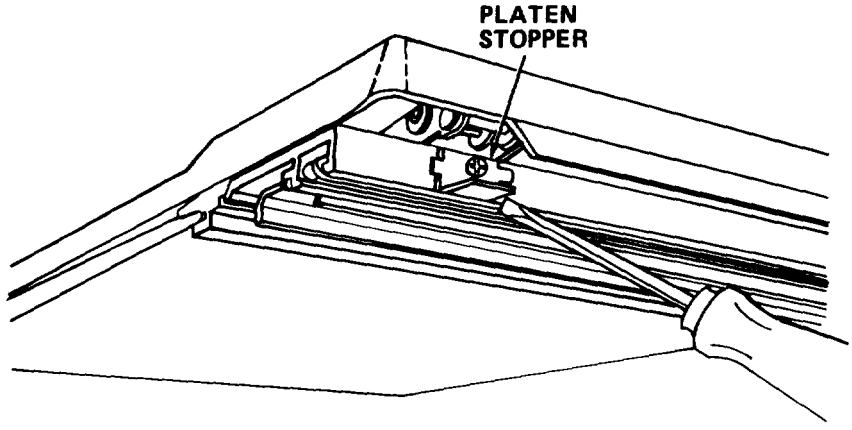
B - Before
D - During
A . After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S . Semiannually
Bl - Biennially

(Number) - Hundreds Of Hours

ITEM NO.	ER-AL	TEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
1	M	Service Fiber Lens **Array - Cont**



2. Remove platen stopper.
3. Remove top middle panel.

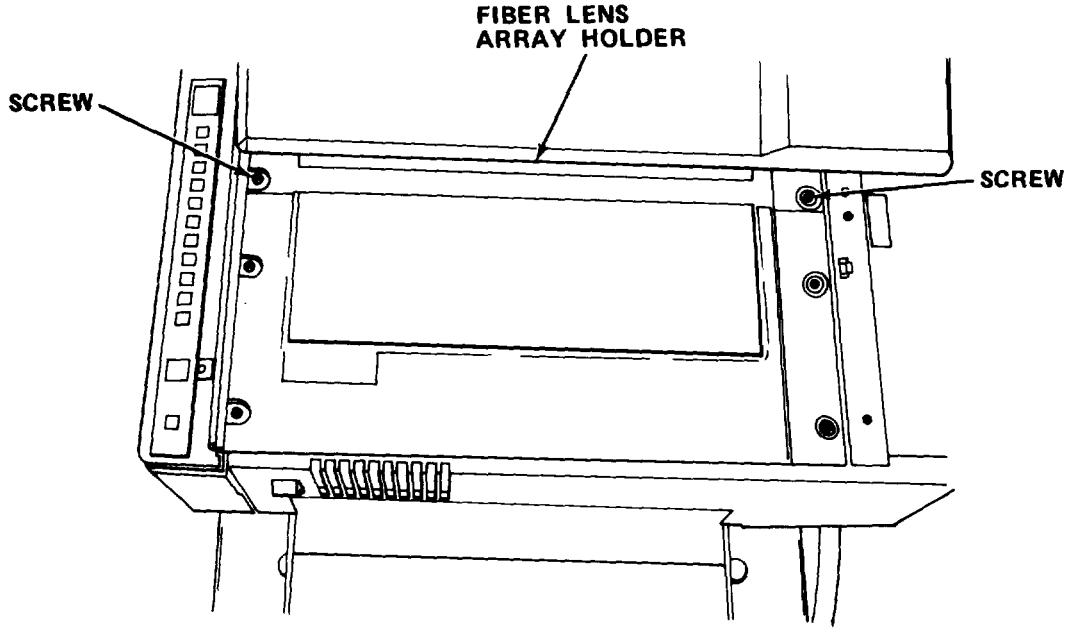


Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S . Semiannually
BI - Biannually

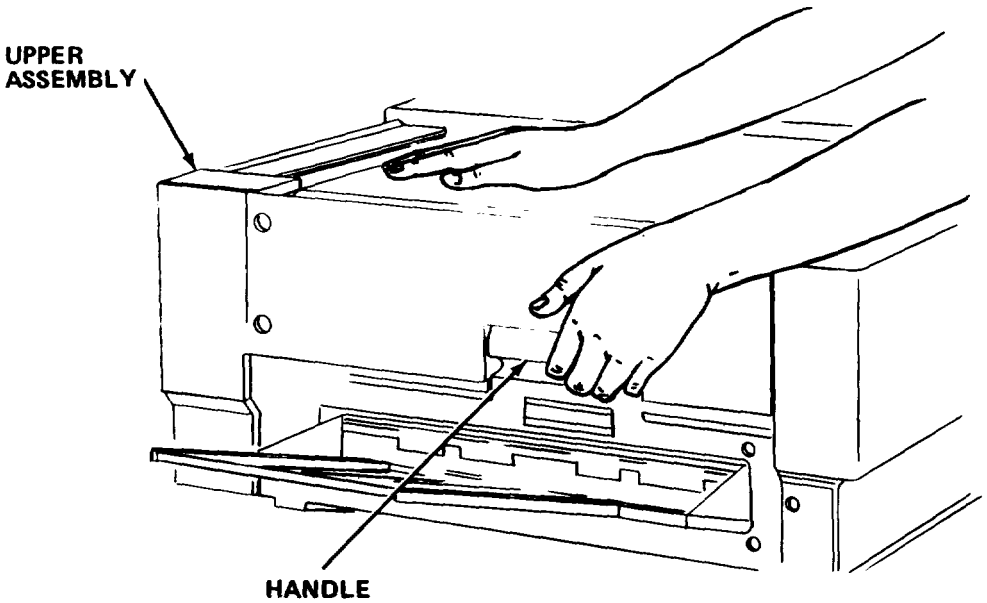
(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
1	M	Service Fiber L ens Array - Cent
		4. Remove screws and fiber lens array.
		5. Inspect top and bottom surfaces of lens array for flaking of coating.
		6. Clean top and bottom surfaces of lens array with a clean cheesecloth.
		7. Reinstall lens array.
		8. Reinstall top middle panel and platen stopper.
		9. Plug in power cord.
2	M	Clean Cl caner Assebly.
		WARNING Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.
		1. Unplug power cord.
		2. Slide platen to the right.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	S - Semiannually	
A - Ater	Q - Quarterly	Bl - Biennially	

ITEM NO.	N-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
2	M	Clean Cleaner Assembly - Cont



3. Grasp handle and gently raise upper assembly to full open position.

CAUTION

Rowel on bottom of cleaner assembly is delicate. Use caution when working with cleaner assembly to prevent damage to this component.

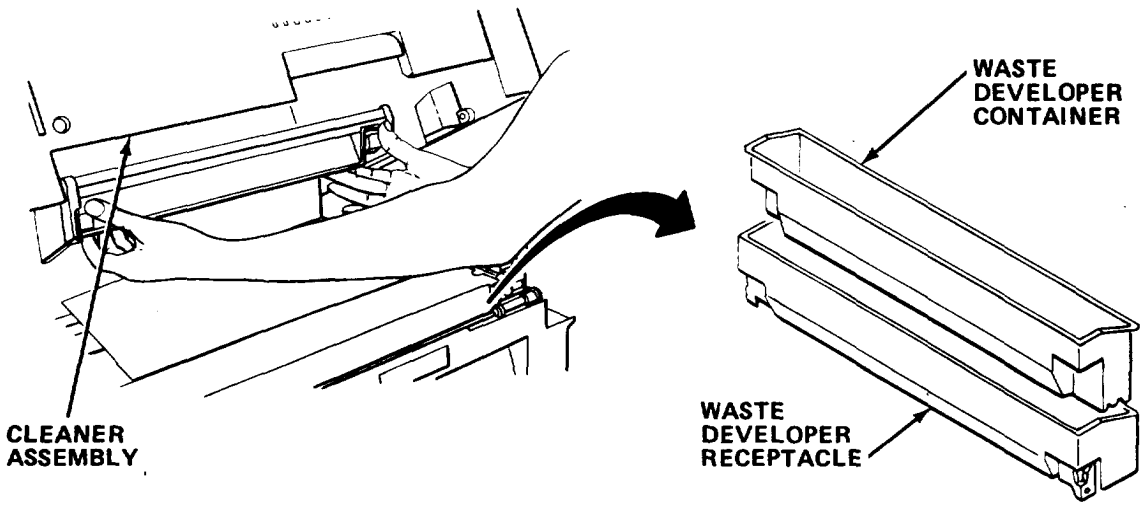
4. Place large sheet of copy paper over bottom of copier.

Table 3-4. **ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont**

B - Before	W - Weekly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	S - Semiannually	
A - After	Q - Quarterly	Bl - Biennially	

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
2	M	Clean Cleaner Assembly - Cont

5. Clean the bottom plate of the cleaner assembly with a moist cheesecloth.



6. Squeeze two clamps on side of cleaner assembly and remove the waste developer receptacle.

7. Discard the old waste developer container, clean the receptacle, and install a new container.

8. Reinstall the waste developer receptacle.

9. Remove copy paper from bottom of copier.

10. Using both hands, gently lower and latch the upper assembly.

11. Return platen to its home (center) position.

12. Plug in power cord.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After | W - Weekly M - Monthly Q - Quarterly | AN - Annually S - Semiannually Bl - Biennially | (Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
3	M	Clean Separation Assembly.

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

1. Unplug power cord.

WARNING

Injury to personnel may occur f care is not taken when cleaning around the sharp spikes of the static charge el minator.

2. Slide platen to the right.
3. Grasp handle and raise upper assembly to full open position.
4. Clean the transfer guideplate, the transfer corona guiderail, and the separation roller.
5. Using both hands, gently lower and latch the upper assembly.
6. Return platen to home position.
7. Plug in power cord.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - semiannually
BI - Biannually

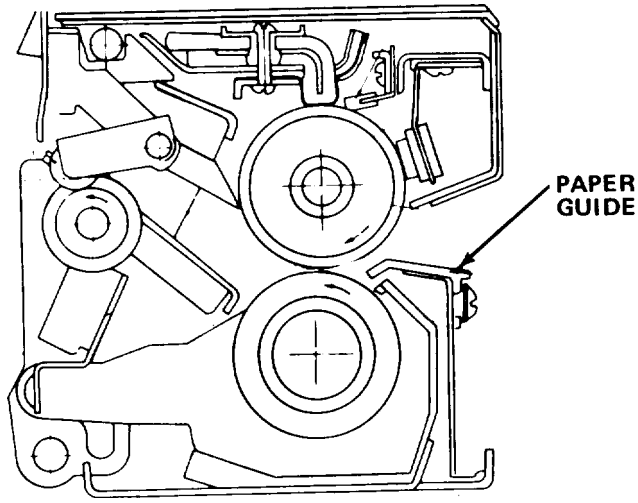
(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED / PROCEDURE
		PLAIN PAPER COPIER - Cont
4	M	Service Fixing Assembly.

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

1. Unplug power cord.
2. Slide platen to right.
3. Grasp handle and raise upper assembly to full open position.



4. Remove upper paper guide.
5. Remove and clean lower paper guide.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After | W - Weakly M - Monthly Q - Quarterly | AN - Annually S - Semiannually BI - Biannually | (Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
4	M	Service Fixing Assembly - Cont
		6. Reinstall upper and lower paper guides.
		7. Remove lower left panel.
		8. Open paper discharge unit.
		9. Wipe up any oil that might have accumulated in the oil drip pan.
		10. Remove insulating cover.
		NOTE As the temperature increases, the oil level in the oil pan will increase by 1/3.
		11. Check level of oil in oil pan. If low, add sufficient amount of oil to bring level to between 1/2 and 2/3 full.
		12. Close paper discharge unit.
		13. Reinstall insulating cover.
		14. Reinstall lower left panel.
		15. Using both hands, gently lower and latch the upper assembly.
		16. Return platen to home position.
		17. Plug in power cord.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN - Annually	(Number] - Hundreds of Hours
D - During	M - Monthly	s - semiannually	
A - After	Q - Quarterly	Bl - Biennially	

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
5	s	Service Separation Assembly.

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

1. Unplug power cord.
2. Slide platen to the right.
3. Grasp handle and raise upper assembly to full open position.

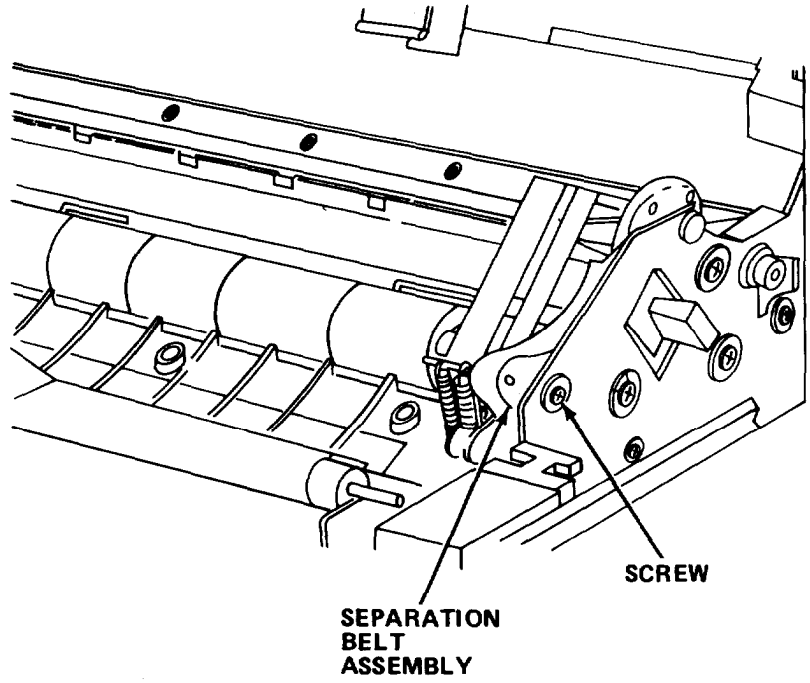


Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

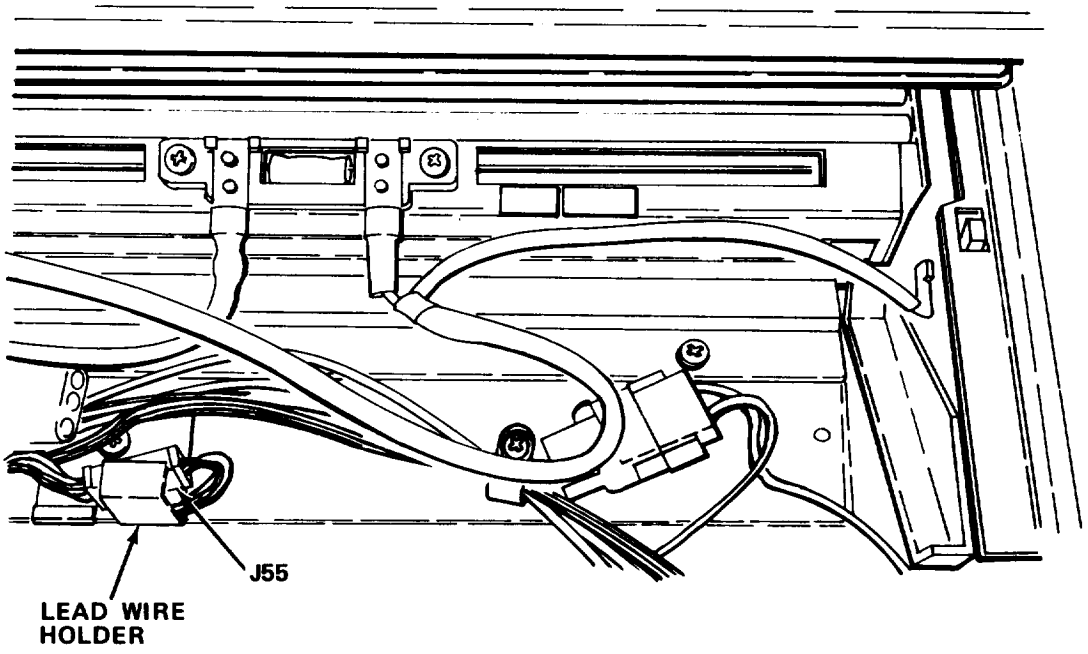
B - Before	W - Weekly	AN - Annually	(Number) . Hundreds of Hours
D - During	M - Monthly	S - Semiannually	
A - After	Cl - Quarterl y	Bl - Biennially	

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
5	s	Service Separation Assemblly - Cont
		4. Remove screw and separation belt assembly.
		5. Wipe separation belt assembly with a clean cheesecloth moistened with water.
		6. Reinstall separation belt assembly.
		7. Using both hands, gently lower and latch the upper assembly.
		8. Return platen to home position.
		9. Plug in power **cord.**
6	s	Service Cleaning Assembly.
		WARNING Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.
		1. Unplug power cord.
		2. Open front door.
		3. Slide platen to the right.
		4. Remove top left panel and ozone filter.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	s - Semiannually	
A - After	Q - Quarterly	Bl - Biennially	

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
6	S	Service Cleaning Assembly - Cont



5. Remove lead wire holder and disconnect J55.
6. Lower blade lever to its rest position, remove screw and blade lever.
7. Grasp handle and raise upper assembly to full open position.
8. Place large sheet of paper over bottom of copier.
9. Remove waste developer receptacle.
10. Holding cleaning assembly with both hands, lift and withdraw it from copy machine.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	S - Semiannually	
A - After	Q - Quarterly	Bl - Biennially	

ITEM NO,	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
6	S	Service Cleaning Assembly - Cont

CAUTION

The rowel on the bottom of the cleaning assembly is delicate. Pay particular attention when handling unit to prevent damage.

11. Remove rowel from bottom of cleaner unit and retain.

12. Place cleaner assembly on flat surface.

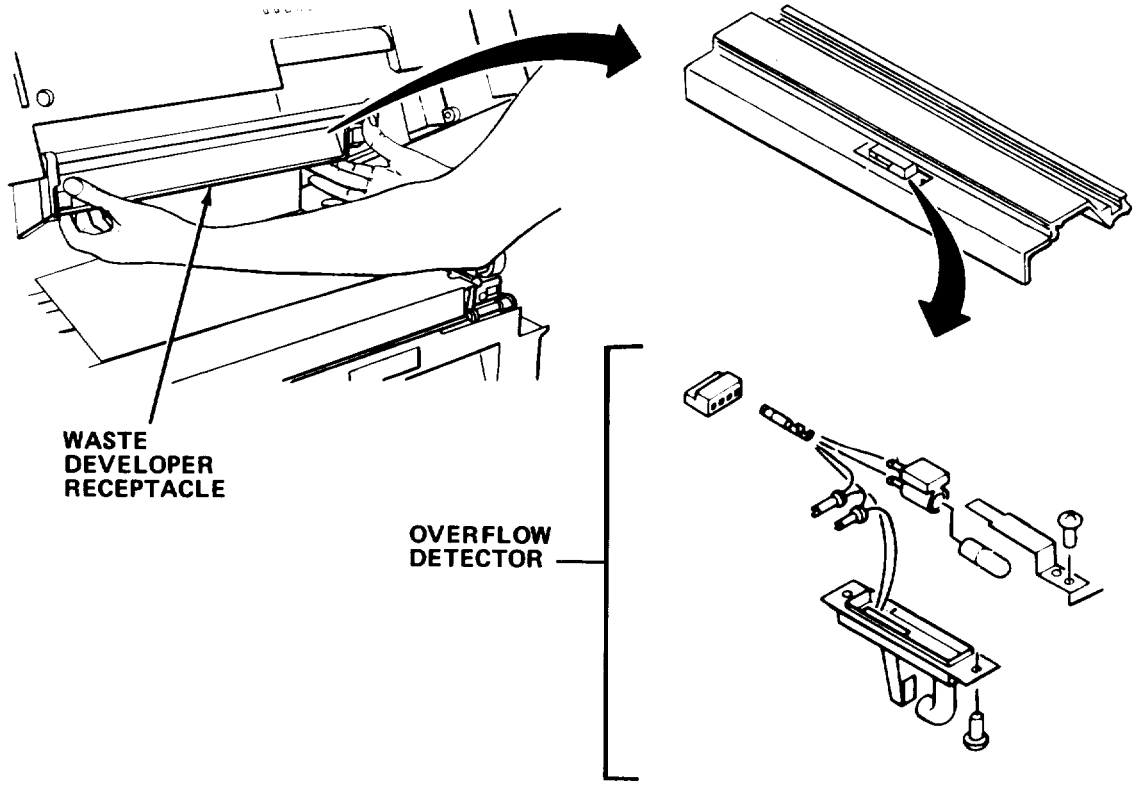


Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	s - Semiannually	
A - After	Q - Quarterly	Bl - Biennially	

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
6	s	Service Cleaning Assembly - Cont
		13. Clean the overflow detector with dry cheesecloth.
		14. Replace the cl caner blade (paragraph 3-20.50).
		15. Discard the liner, clean waste receptacle, and install new liner.
		16. Reinstall waste developer receptacle.
		17. Reinstall rowel on cleaner unit.
		18. Reinstall cleaner assembly.
		19. Remove paper from bottom of copier.
		20. Reinstall blade lever and lift into position.
		21. Using both hands, gently lower upper assembly.
		22. Reinstall lead wire holder and reconnect J55.
		23. Reinstall ozone filter and top left panel.
		24. Close front door.
		25. Return platen to home position.
		26. Plug in power cord.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
Bl - Biennially

(Number) - Hundreds of Hours

ITEM NO	IN-TERVAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
7	s	Service Fixing Assembly.

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

1. Unplug power cord.
2. Shift platen to the right.
3. Grasp handle and raise upper assembly to full open position.
4. Remove lower left panel.

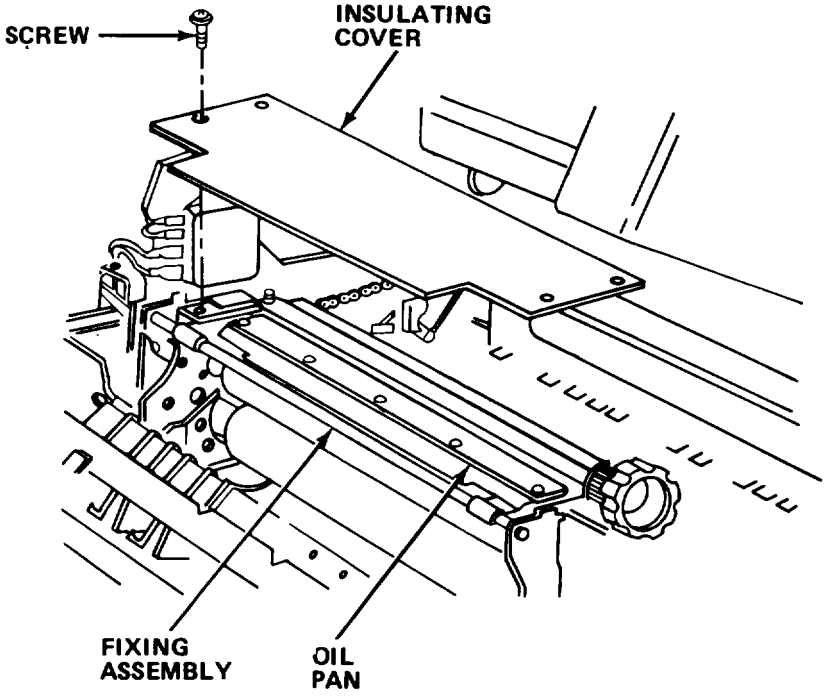
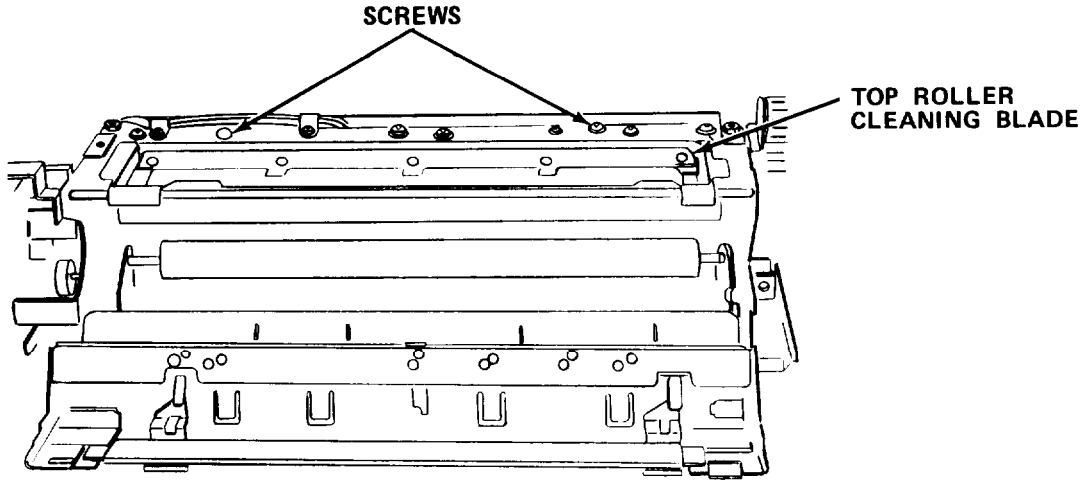


Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	S - Semiannually	
A - After	Q - Quarterly	BI - Biennially	

	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
7	S	Service Fixing Assembly - Cont
		5. Remove insulating cover of the fixing assembly.
		6. Remove the oil pan and clean the applicator wick with cheesecloth.



7. Remove the top roller cleaning blade.
8. Clean the top roller and cleaning blade.
9. Reinstall top roller cleaning blade.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

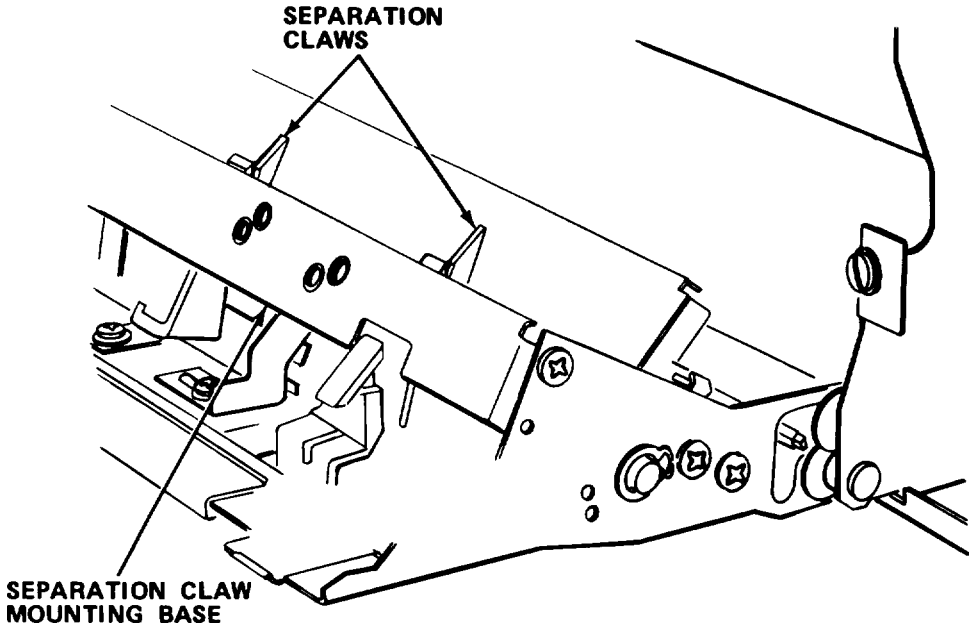
B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
Bl - Biennially

(Number) - Hundreds of Hours

ITEM NO	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
7	S	Service Fixing Assembly - Cont



10. Remove lower left panel.
11. Open paper discharge unit.
12. Clean separation claws with cheesecloth.
13. Close paper discharge unit.
14. Remove upper and lower paper guides and clean.
15. Remove thermistor and clean.
16. Reinstall thermistor and upper and lower paper guides.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before W - Weekly AN - Annually (Number) - Hundreds of Hours
D - During M - Monthly s . Semiannually
A - After Q - Quarterly Bl - Biennially

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
7	s	Service Fixing Assembly - Cont
		17. Close paper discharge unit.
		18. Reinstall oil pan.
		19. Reinstall insulating cover.
		20. Reinstall lower left panel.
		21. Using both hands, gently lower and latch upper assembly.
		22. Return platen to home position.
		23. Plug in power cord.
8	s	Service Photosensitive Drum.
		WARNING Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.
		1. Unplug power cord.
		2. Open front door.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

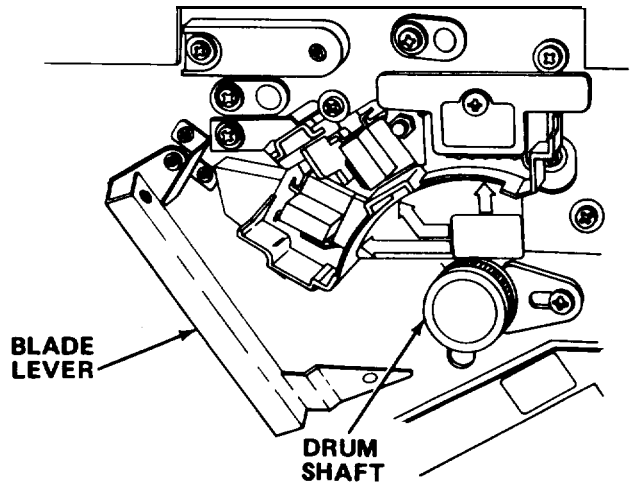
B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
Bl - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
8	S	Service Photosensitive Drum - Cont



3. Lift blade lever out of groove in drum shaft, pull it out to clear shaft, lower it to its rest position, and lock in place.

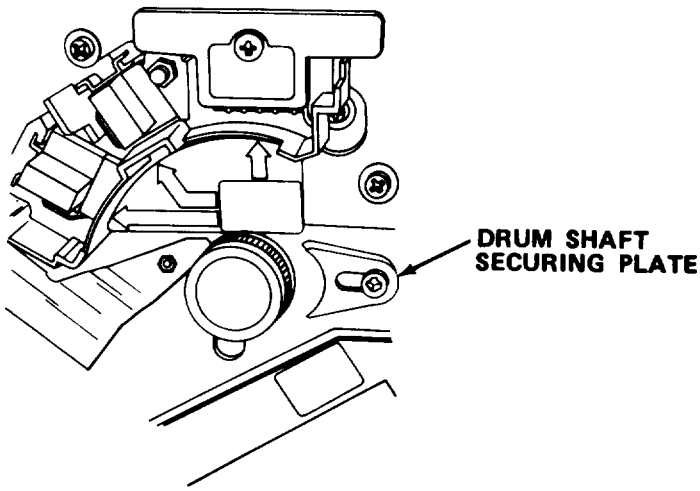


Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After | W - Weekly M - Monthly Q - Quarterly | AN - Annually S - Semiannually BI - Biennially | (Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
8	S	Service Photosensitive Drum - Cont
		4. Loosen, but do not remove, screw of drum shaft securing pl ate.
		5. Slide plate to the right, free of groove in shaft.
		6. Pull drum shaft free from copier.
		7. Slide platen to the right.
		8. Grasp handle and raise upper assembly to full open position.
		WARNING Drum may be hot and can cause personal injury.
		CAUTION Use cloth or paper while removing drum to prevent damage to drum.
		NOTE ● Store removed drum in a place away from direct sunlight, dust, ammonia, or anything that might scratch the surface. ● If drum surface is scratched, the drum must be replaced (paragraph 3-20.48). ● When drum replacement is required, the corona wire should be set to the specifications as indicated on the panel inside the front door.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After | W - Weekly M - Monthly Q - Quarterly | AN - Annually S - Semiannually BI - Biennially | (Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
8	s	Service Photosensitive Drum - Cont
		9. Carefully remove drum from copier.
		10. Clean drum as follows:
		(a) Wipe off drum with a clean, dry, cheese-cloth.
		CAUTION
		Do not use solvent or alcohol alone to clean drum as the drum surface will be damaged.
		(b) If marks or smears are present, use lens cleaning paper moistened with a mixture of alcohol and drum cleaning powder.
		11. Carefully place drum back in cradle on top of the transfer section.
		NOTE
		Be sure drum is pushed all the way toward the front of the machine.
		12. Using both hands, carefully lower and latch the upper assembly.
		13. Insert drum shaft and position securing plate in groove in shaft and tighten screw.
		14. Grasp handle and raise upper assembly.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN . Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	s - Semiannually	
A- After	Q - Quarterly	BI - Biennially	

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
8	S	**Service Photosensitive Drum - Cont**
		CAUTION Avoid touching the yellow portion of the drum.
		15. Manually rotate drum to the left until it stops.
		16. Using both hands, carefully lower and latch the upper assembly.
		17. Raise the blade lever and position it in groove in drum shaft.
		18. Close front door.
		19. Plug in power cord.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B . Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

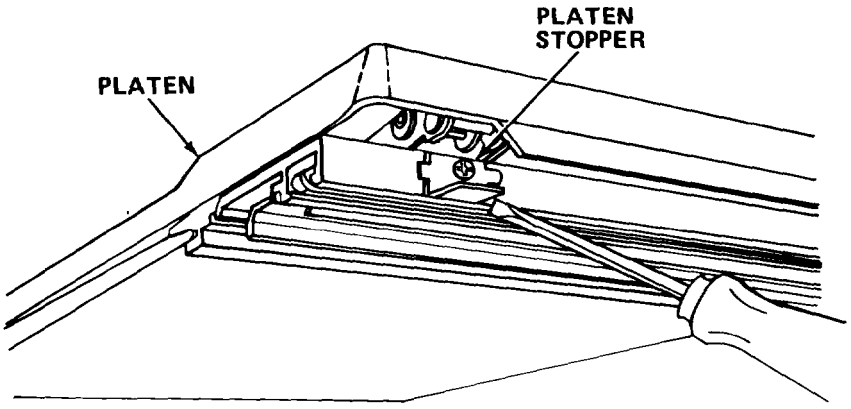
(Number) - Hundreds of Hours

ITEM NO.	IN-ER-AL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
9	S	Inspect and Clean Infrared-Cut Filter.

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

1. Unplug power cord.



2. Remove right hand platen stopper.
3. Slide platen to the left.
4. Remove upper middle panel.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
Bl - Biennially

(Number) - Hundreds of Hours

ITEM NO.	N-TER-t/AL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
9	S	Inspect and Clean Infrared-Cut Filter - Cont

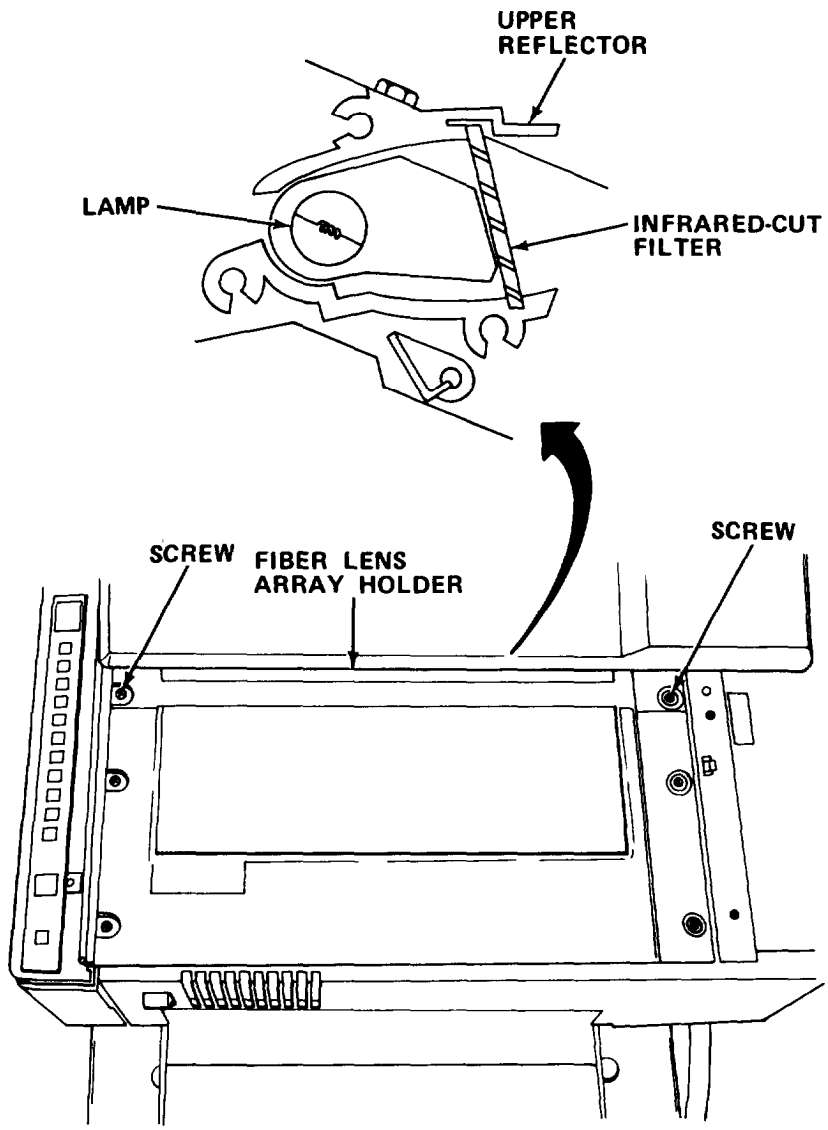


Table 34. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - Ater | W - Weakly M - Monthly Q - Quarterly | AN • Annually S Ž Semiannually BI Ž Biennially | (Number) - Hundreds of Hours

ITEM NO.	N-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
9	s	Inspect and Clean Infrared-Cut Filter - Cont
		CAUTION Do not **touch optical surfaces with fingers.** Body oils will ruin optical surfaces.
		5. Remove upper reflector.
		6. Remove infrared-cut filter and clean with lens cleaning material.
		NOTE The coated side of the filter must face lamp.
		7. Reinstall filter and upper reflector.
		8. Clean platen glass with lens cleaning material.
		9. Reinstall top left panel.
		10. Reinstall right platen stopper.
		11. Return platen to home position.
		12. Plug in power cord.
10	A	Service Developing Section.
		Replace front and rear side seals and scraper blade (paragraph 3-20.30).

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weakly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	s - Semiannually	
A - After	Q - Quarterly	BI - Biennially	

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
11	BI	Replace Oil pan.
		WARNING
		Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.
		1. Unplug power cord.
		2. Slide platen to the right.
		3. Grasp handle and raise upper assembly to full open position.
		4. Remove insulating cover on fixing unit.
		5. Remove old oil pan and discard.
		6. Instal 1 new oil pan and add one bottle (50 cc) of silicone oil.
		7. Reinstall insulating cover.
		8. Using both hands, gently lower and latch upper assembly.
		9. Return platen to home position.
		10. Plug in power cord.
12	BI	Service Fixing Assembly.
		Replace top and bottom roller, top roller bushing, top and bottom cleaning blades, thermistor, and upper and lower separation claws (paragraphs 3-20.37, 3-20.55).

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before W - Weakly AN - Annually (Number) - Hundreds of Hours
D - During M - Monthly S - Semiannually
A - After Q - Quarterly BI - Biennially

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
13	BI	Service Cleaner Assebly. Replace side seals, oil seals, side felt, foam seals and spacer rollers (paragraph 3-20.54).
14	BI	Service Developing Assembly. **WARNING** Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing. 1. Unplug power cord. 2. Slide platen to the left. 3. Remove top right panel. 4. Raise holddown clamps.

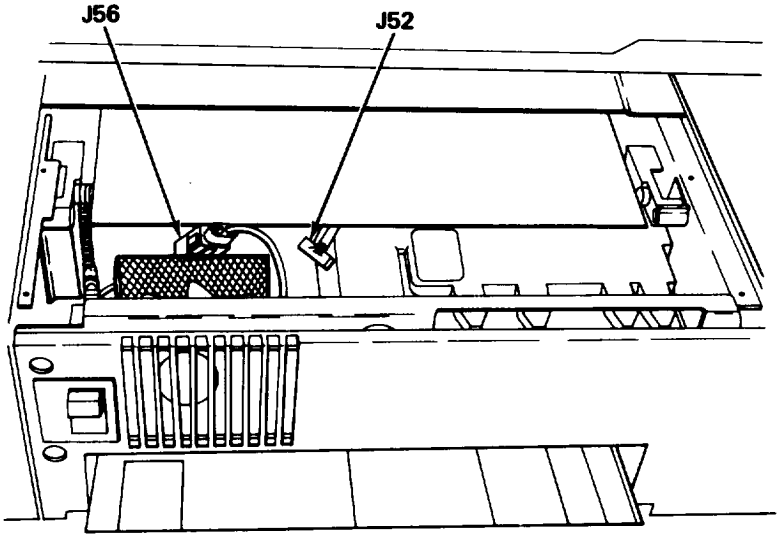
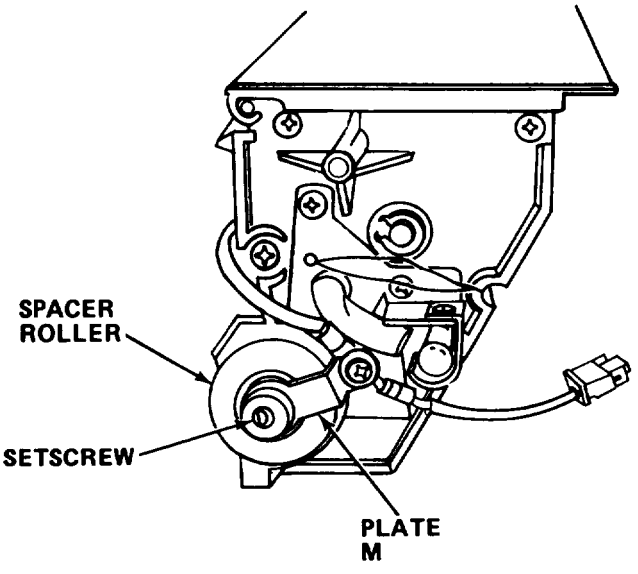


Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	s - Semiannually	
A - After	Q - Quarterly	BI - Biennially	

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
14	BI	Service Developing Assembly - Cont
		5. Unplug connectors J52 and J56.
		6. Slowly lift developer assembly and remove it.
		7. Place assembly on flat surface covered with paper to keep foreign matter from being attracted to developing cylinder.



8. Loosen setscrew, remove securing screw for bias cable terminals.

9. Remove plate M.

10. Remove grip ring and spacer roller.

11. Install new spacer roller and grip ring.

Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

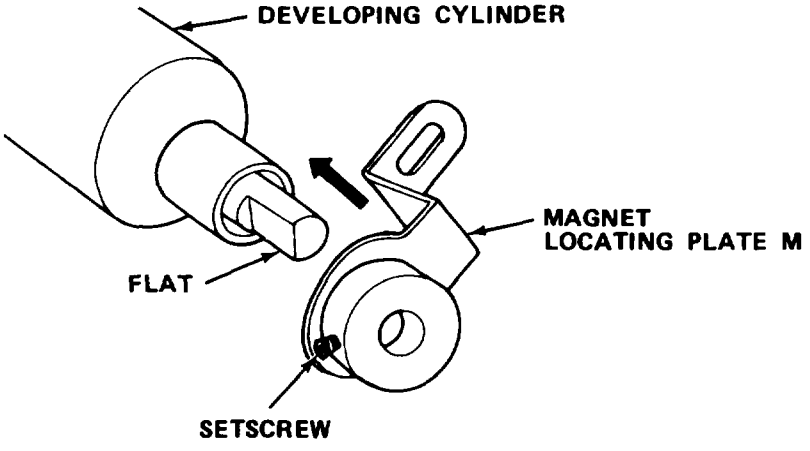
B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
s - semiannually
Bl - Biannually

(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
14	BI	Service Developing Assembly -Cont



12. Rotate developing cylinder shaft so that flat on shaft is alined with the position of the setscrew on plate M and install plate M, then tighten setscrew.

13. Reinstall securing screw for the bias cable.

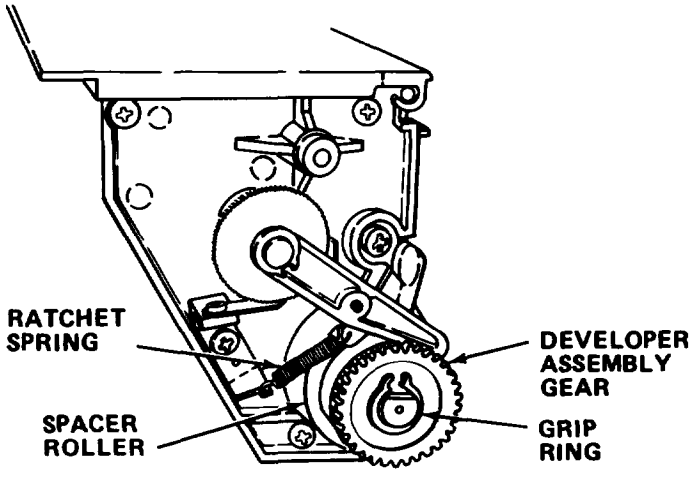


Table 3-4. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weakly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	S . Semiannually	
A - After	Q - Quarterly	Bl - Biennially	

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PLAIN PAPER COPIER - Cont
14	BI	Service Developing Assembly - Cont
		14. Remove grip ring and developing assembly gear.
		15. Remove ratchet spring and remove spacer roller.
		16. Install new spacer roller and reinstall ratchet spring.
		17. Reinstall developing assembly gear and grip ring.
		18. Slowly lower developing assembly onto its support while pushing toward rear side plate.
		19. Reconnect connectors.
		20. Lower holddown clamps.
		21. Reinstall top right panel.
		22. Return platen to home position.
		23. Plug in power cord.

3-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES. There are no organizational troubleshooting procedures assigned for this equipment.

3-16. MAINTENANCE PROCEDURES. There are no organizational maintenance procedures assigned for this equipment.

3-17. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

3-18. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE) ; AND SUPPORT EQUIPMENT

3-18.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

3-18.2 Special Tools: Test, Measure e t. and Diagnostic Equipment; and Support Equipment. Special Tools, TMDE and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.

3-18.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-6675-324-24P covering direct/general support maintenance for this equipment.

3-19. DIRECT/GENERAL SUPPORT TROUBLESHOOTING PROCEDURES. Direct/general support troubleshooting procedures cover the most common malfunctions that may be repaired at the direct/general support level. Repair or adjustment requiring specialized equipment is not authorized unless such equipment is available. Troubleshooting procedures used by lower level maintenance should be conducted in addition to the direct/general support troubleshooting procedures.

NOTE

Sufficient data is not available for you to test or troubleshoot printed circuit boards. When associated wiring, ribbon cables, power cords, and other related electrical components have been eliminated as possible faults, then the printed circuit boards must be substituted, one for one, until the fault is isolated.

SYMPTOM INDEX

SYMPTOM INDEX - Cont

SYMPTOM INDEX - Cont

NOTE

For any copy quality problem, these are a few of the things that should be checked before any troubleshooting is started.

1. ENVIRONMENT.

   a. Is the incoming power correct?
   b. Is temperature and humidity within specified limits?
   c. In low temperature areas, keep machine plugged in at night to keep the drum heater in operation.
   d. Keep away from ammonia fumes.
   e. Is the machine level?
   f. Is adequate ventilation available?

2. ORIGINALS BEING COPIED.

   a. Determine if problem is with the machine or due to the original you are trying to copy.
   b. Is the exposure control lever set correctly?
   c. Originals that are on colored paper or have a lot of color will not be clear.

3. CHECK THAT COPYBOARD GLASS AND COVER ARE CLEAN.

4. COPY PAPER.

   a. Is the correct type of paper being used?
   b. Is the paper dry?

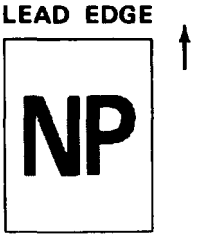
NOTE

In the following procedures, the lead edge will be toward the top of the paper.

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

1. LIGHT IMAGE (MAY HAVE FAINT VERTICAL AREAS).



Step 1. Developer is low.

Refill hopper (paragraph 3-6.2.1).

Step 2. Transfer corona assembly is not seated correctly.

Reseat transfer corona.

Step 3. Paper has high moisture content.

Replace paper.

Step 4. Incorrect output from high-voltage transformer.

(a) Replace high-voltage cable connector (paragraph 3-20. 11).

(b) Replace high-voltage transformer (paragraph 3-20.19).

Step 5. Primary and secondary corona grid wires are dirty.

(a) Clean grid wires (Table 3-2, PMCS 2).

(b) Adjust height of primary corona (paragraph 3-20.40).

Step 6. Exposure reflector is dirty.

Clean reflector (Table 3-4, PMCS 9).

Step 7. Fiber lens array is dirty.

Clean lens (Table 3-4, PMCS 1).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

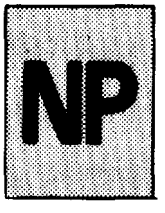
MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
1. LIGHT IMAGE (MAY HAVE FAINT VERTICAL AREAS) - Cont	
Step 8. Developing assembly not mounted correctly.	Mount assembly correctly.
Step 9. Developing bias is faulty.	(a) Check contacts of connector. (b) Replace high-voltage transformer (paragraph 3-20.19).
Step 10. Halogen lamp intensity is too low.	Perform halogen lamp intensity adjustment (paragraph 3-20.3).
Step 11. Moisture is on drum.	(a) Wipe drum. (Table 3-4, PMCS 8). (b) Keep power cord connected to outlet when copier is not in use.
2. FOGGED IMAGE.	
	
Step 1. Preconditioning exposure reflector is dirty.	Clean reflector (Table 3-4, PMCS 9).
Step 2. Primary corona height is incorrect.	Adjust corona height (paragraph 3-20.40).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

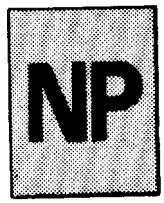
MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
2. FOGGED IMAGE - Cont	
Step 3. Secondary corona wire is dirty.	Clean corona wire (Table 3-2, PMCS 2).
Step 4. Fiber lens array is dirty.	Clean fiber lens array (Table 3-4, PMCS 1).
Step 5. Excessive clearance between developing cylinder and blade.	Adjust clearance (paragraph 3-20.29).
Step 6. Halogen lamp intensity is too low.	Perform halogen lamp Intensity adjustment (paragraph 3-20.3).
3. FOGGED LIGHT IMAGE.	
Step 1. Preconditioning exposure reflector is dirty.	Clean reflector. (Table 3-4, PMCS 9)
Step 2. Secondary corona wire is dirty.	Clean corona wire. (Table 3-2, PMCS 2)
Step 3. Secondary corona voltage is incorrect.	Adjust corona voltage (paragraph 3-20.38).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

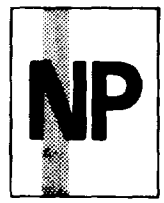
MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
3. FOGGED LIGHT IMAGE - Cont	
Step 4. Secondary corona rear grid terminal making poor contact. (a) Form to make contact. (b) Replace corona (paragraph 3-20.39).	
Step 5. Primary corona height is incorrect. Adjust corona height (paragraph 3-20.40).	
Step 6. Fiber lens array is dirty. Clean lens array (Table 3-4, PMCS 1).	
Step 7. Halogen lamp is defective. Replace halogen lamp (paragraph 3-20.21).	
Step 8. Photosensitive drum is defective. Replace drum (paragraph 3-20.48).	
4. VERTICAL FOG STRIPE(S).	
	
Step 1. Cleaner blade is loose. Tighten blade (paragraph 3-20.50).	

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
4. VERTICAL FOG STRIPE(S) - Cont
Step 2. Primary and secondary corona wires are dirty. Clean wires (Table 3-2, PMCS 2).
Step 3. Optical system is dirty. Clean optical system (Table 3-4, PMCS 1).
Step 4. Developer assembly contains foreign matter. Replace developer (paragraph 3-6.2.1).
5. HORIZONTAL FOG STRIPE(S).

Step 1. Secondary corona is defective. (a) Replace (paragraph 3-20.39). (b) Adjust secondary corona voltage (paragraph 3-20.38). (c) Clean corona (Table 3-2, PMCS 2).
Step 2. Developer assembly guide roller is dirty. Clean roller (paragraph 3-20.28).
Step 3. Insufficient clearance between developing cylinder and blade. Adjust clearance (paragraph 3-20.29).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
5. HORIZONTAL FOG STRIPE(S) - Cont	
Step 4. Binding in cleaner drive system.	Replace cl caner assembly gears (paragraph 3-20.53).
6. DIRTY BLANK STRIP.	
	
Step 1. Developer assembly felt side seals are incorrectly positioned.	Replace felt side seals (paragraph 3-20.30).
Step 2. Gap is 'between side scraper and side seal on developer assembly.	Replace side seal (paragraph 3-20.30).
Step 3. Developer assembly side seals are worn.	Replace side seals (paragraph 3-20.30).
Step 4. Separation belt assembly is dirty.	Clean belt (Table 3-4, PMCS 5).
Step 5. Developer leaks onto preconditioning, primary, and secondary coronas from cleaning assembly.	(a) Clean coronas (Table 3-2, PMCS 2). (b) Adjust blade pressure (paragraph 3-20.50). (c) Reseat side seal (paragraph 3-20.54).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
7. DARK VERTICAL LINES.	
Step 1. Paper jam is at cleaner blade. Remove jam (paragraph 3-6.2.3).	
Step 2. Cleaner blade has nicks in edge. (a) Reverse blade (paragraph 3-20.50). (b) Replace blade (paragraph 3-20.50).	
Step 3. Cleaner blade pressure is incorrect. Adjust blade pressure (paragraph 3-20.50).	
Step 4. Photosensitive drum has scratches on its surface. Replace drum (paragraph 3-20.48).	
Step 5. Position of separation belt is incorrect. Reposition separation belt assembly.	

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
8. THIN VERTICAL LINES.	
Step 1. Fixing assembly oil applicator is dirty. Replace oil applicator (Table 3-4, PMCS 7).	
Step 2. Developer adheres to fixing assembly top roller. Clean top roller (Table 3-4, PMCS 7).	
Step 3. Paper jam is near cleaner blade. Remove jam (paragraph 3-6.2.3).	
Step 4. Cleaner blade has nicks in edge. (a) Reverse blade (paragraph 3-20.50). (b) Replace blade (paragraph 3-20.50).	
Step 5. Cleaner blade is improperly adjusted. Adjust blade (paragraph 3-20.50).	
Step 6. Photosensitive drum has scratches on its surface. Replace drum (paragraph 3-20.48).	
Step 7. Loose separation belt assembly. Tighten separation belt mounting screw.	

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

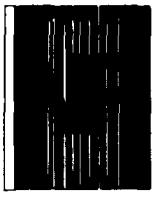
MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
9. THIN VERTICAL WHITE LINES.	
Step 1. Paper jam is near cleaner blade. Remove jam (paragraph 3-6.2.3).	
Step 2. Cleaner blade is loose. Tighten blade (paragraph 3-20.50).	
Step 3. Foreign matter is in developer hopper. Replace developer (paragraph 3-6.2.1).	
Step 4. Separation claws are dirty. Clean separator claws (Table 3-4, PMCS 7).	
Step 5. Scratches are on photosensitive drum. Replace drum (paragraph 3-20.48).	

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
10. FAINT VERTICAL LINES.	
Step 1. Paper jam is near cleaner blade. Remove jam (paragraph 3-6.2.3).	
Step 2. Secondary corona wires are dirty. Clean corona wires (Table 3-2, PMCS 2).	
Step 3. Optical system is dirty. Clean optical system. (Table 3-4, PMCS 1)	
Step 4. Developer is on developing roller. Clean roller.	
11. SHARP HORIZONTAL BLACK LINES.	
Scratches are on photosensitive drum. Replace drum (paragraph 3-20.48).	

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

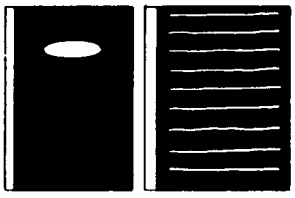
MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
12. HORIZONTAL WHITE LINES ON BLACK COPY. 	
Copy paper is damp.	Install new paper.
13. FAINT IMAGE. 	
Platen rail is dirty.	Clean platen rail (Table 3-2, PMCS 5).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
14. BLURRED IMAGE.	
	
Step 1. Platen drive wire is twisted or frayed.	Replace wire (paragraph 3-20.34).
Step 2. No grease on gear teeth.	Lubricate (paragraph 3-11).
Step 3. Foreign matter is on platen rail.	Clean platen rail (Table 3-2, PMCS 5).
Step 4. Improper voltage to clutch.	Perform platen forward clutch initial voltage adjustment (paragraph 3-20.2).
Step 5. Incorrect clearance between drum gear and cleaner drive gear.	Replace cleaner drive gear (paragraph 3-20.53).
Step 6. Developing roller is dirty.	Clean developing roller (paragraph 3-20.28).
Step 7. Scratches are on ends of the photosensitive drum.	Replace drum (paragraph 3-20.48).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

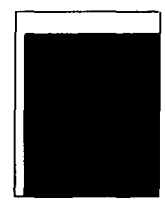
MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
15. FAULTY REGISTRATION.	
	
Step 1. Reed switch RS2 is out of alinement.	Adjust RS2 (paragraph 3-20.31).
Step 2. Leading edge area is incorrect.	Adjust reed switch RS3 (paragraph 3-20.31).
Step 3. Registration clutch spring is defective.	Replace clutch spring (paragraph 3-20.14).
16. POOR FIXING.	
	
Step 1. Bottom roller of fixing assembly is not applying pressure.	Adjust bottom roller (paragraph 3-20.35).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

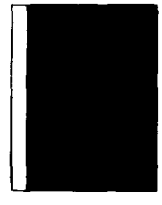
MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
16. POOR FIXING - Cont	
Step 2. Silicone oil reservoir is empty.	Refill oil reservoir (Table 3-4, PMCS 4).
Step 3. Top and bottom fixing rollers are deformed.	Replace fixing rollers (paragraph 3-20.37).
Step 4. Drum heater is defective.	Replace drum heater (paragraph 3-20.47).
17. BLACK COPY.	
	
Step 1. Secondary corona is defective.	Replace secondary corona (paragraph 3-20.39).
Step 2. High-voltage transformer output is abnormal.	Replace high-voltage transformer (paragraph 3-20.19).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

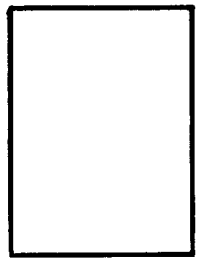
MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
18. BLANK COPY.	
	
Step 1. Halogen lamp is defective.	Replace lamp (paragraph 3-20.21).
Step 2. Developing cylinder does not rotate while drum is rotating.	Replace developer assembly (paragraph 3-20.30).
Step 3. Primary corona is defective.	Replace primary corona (paragraph 3-20.41).
Step 4. High-voltage transformer is defective.	Replace transformer (paragraph 3-20.19).
19. STAINED COPY.	
Step 1. Leading edge blank space is out of adjustment.	Adjust leading blank edge (paragraph 3-20.31).
Step 2. Developer is adhering to separation belt and roller.	Clean belt and roller (Table 3-4, PMCS 3 and 5).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
19. STAINED COPY - Cont	
Step 3. Developer is on paper guide Plate.	Clean guide plate (Table 3-4, PMCS 3).
Step 4. Developer is on cleaner bottom plate.	Clean bottom plate (Table 3-4, PMCS 2).
Step 5. Developer deposits on transfer guide, transfer corona, feed belt, or separation belt roller.	Clean. (Table 3-4, PMCS 3).
20. THERE IS NO POWER. (See FO-3-2.)	
Step 1. Copier power cord is not plugged in.	Plug in power cord.
Step 2. Front panel and upper assembly are not closed.	Close securely.
Step 3. Power switch is defective.	Replace switch (paragraph 3-20.8).
Step 4. Circuit breaker CB1 is off.	Turn circuit breaker on.

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
21. DRUM DOES NOT ROTATE .	
Step 1. Copy counter is not connected.	Reconnect properly.
Step 2. Main motor does not start when COPY START key is pressed.	(a) Repair defective leads to main motor. (b) Replace main motor (paragraph 3-20.9).
Step 3. No input to ac driver board.	(a) Repair leads to ac driver board. (b) Replace connector.
Step 4. Halogen lamp does not light during cassette or manual feed.	Replace ac driver board (paragraph 3-20.7).
Step 5. Inputs to dc controller PC board are good, but there are no outputs.	Replace dc controller PC board (paragraph 3-20.10).
22. NO PAPER IS FED FROM CASSETTE.	
Step 1. Reed switch RS3 is defective.	Replace switch (paragraph 3-20.18).
Step 2. No inputs or outputs to dc controller PC board.	(a) Repair leads. (b) Replace connector.
Step 3. Inputs are normal, but no output from dc controller PC board.	Replace dc controller PC board (paragraph 3-20.10).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
23. PAPER IS NOT ACCEPTED FROM MANUAL FEED GUIDE.	
Dc controller PC board is defective.	Replace PC board (paragraph 3-20.10).
24. PLATEN RAIL DOES NOT MOVE FORWARD.	
Step 1. Copyboard does not move smoothly when pushed by hand. Check copyboard glass and clearance of front rail.	Aline rail (paragraph 3-20.33).
Step 2. Slack in platen drive wire.	Adjust drive wire (paragraph 3-20.32).
Step 3. Reed switch RS4 is defective.	Replace switch (paragraph 3-20.18).
Step 4. No input to platen clutch.	Replace connector.
Step 5. No input to dc controller PC board.	Replace connector.
Step 6. Input to dc controller, but no output.	Replace dc controller PC board (paragraph 3-20.10).
25. PLATEN DOES NOT REVERSE.	
Step 1. No clearance between platen rail and glass.	Adjust clearance (paragraph 3-20.33).
Step 2. Slack in platen drive wire.	Adjust wire (paragraph 3-20.32).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
25. PLATEN DOES NOT REVERSE - Cont	
Step 3. No inputs to platen clutch.	Replace connector.
Step 4. No input to dc controller PC board.	Replace connectors.
Step 5. Normal input to dc controller board, but no output.	Replace dc controller PC board (paragraph 3-20.10).
Step 6. COPY START key is defective.	Replace key.
26. PLATEN DOES NOT STOP IN HOME POSITION AFTER FINISHING COPY OPERATION.	
Step 1. Mounting position of reed switch RS1 is misadjusted.	Adjust reed switch RS1 (paragraph 3-20.18).
Step 2. VR207 is misalined.	Adjust platen brake (paragraph 3-20.18).
Step 3. Reed switch RS1 is defective.	Replace switch (paragraph 3-20.18).
Step 4. No input to dc controller PC board.	Replace connector.
Step 5. Normal input, but no output from dc controller PC board.	Replace dc controller PC board (paragraph 3-20.10).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
27. HALOGEN LAMP DOES NOT LIGHT.	
Step 1. Main motor does not energize during manual or cassette feed.	(a) Repair defective main motor leads. (b) Replace main motor (paragraph 3-20.9).
Step 2. Thermal fuse defective.	Replace fuse (FU1) (paragraph 3-20.58).
Step 3. Lamp is improperly mounted.	Open front panel. Tighten screw holding lamp socket in place.
Step 4. Lamp is defective.	Replace lamp (paragraph 3-20.21).
Step 5. No output to halogen lamp.	(a) Replace connectors. (b) Replace ac driver board (paragraph 3-20.7).
Step 6. Drum heater terminals are defective.	Replace terminals (paragraph 3-20.46).
Step 7. No output from lamp regulator but input is good.	(a) Repair lead. (b) Replace connector. (c) Replace lamp regulator PC board (paragraph 3-20.20).
Step 8. No input to dc controller PC board.	Replace connector.

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
27. HALOGEN LAMP DOES NOT LIGHT - Cont	
Step 9. Normal input, but no output from dc controller PC board.	Replace dc controller PC board (paragraph 3-20.10).
28. BLANK EXPOSURE SHUTTER DOES NOT OPERATE .	
Step 1. With power off, blank exposure shutter does not move.	Adjust shutter (paragraph 3-20.17).
Step 2. No input to connector PC board.	Replace connectors J54 and J402.
Step 3. No input to dc controller PC board.	Replace connector.
Step 4. No output from dc controller board.	Replace dc controller board (paragraph 3-20.10).
29. NO OUTPUT FROM HIGH-VOLTAGE TRANSFORMER.	
Step 1. No input on J413 during copying operations.	(a) Replace defective wire. (b) Replace high-voltage transformer (paragraph 3-20.19).
Step 2. Connector PC board is defective.	Replace connector PC board (paragraph 3-20.16).
Step 3. Dc controller board is defective.	Replace dc controller PC board (paragraph 3-20.10).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
30. FUSER HEATER DOES NOT LIGHT.
Step 1. Front door not closed completely. Close front door.
Step 2. Check for defective heater thermal fuse. Replace thermal fuse (FU2) (paragraph 3-20.58).
Step 3. No ac input on Q51-1 to J2-2. Replace defective lead.
Step 4. Thermistor is defective. Replace thermistor (paragraph 3-20.36).
Step 5. Ac driver board is defective. Replace ac driver board (paragraph 3-20.7).
31. JAM INDICATOR FLASHES DURING STANDBY.
Step 1. Upper unit is not properly closed. Close properly.
Step 2. Jam reset microswitch is defective. Replace microswitch (paragraph 3-20.15).
Step 3. Dc controller PC board is defective. Replace board (paragraph 3-20.10).
32. PAPER JAMS BUT IS NOT DETECTED.
Dc controller PC board is defective. Replace board (paragraph 3-20.10).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
33. JAM INDICATOR ON DURING EVERY COPYING CYCLE.
Step 1. Paper misfeed. Clear paper feed path.
Step 2. Paper detection reed switch is misadjusted or defective. (a) Adjust reed switch (RS5) (paragraph 3-20.18). (b) Replace switch (paragraph 3-20.18).
Step 3. Dc controller PC board is defective. Replace board (paragraph 3-20.10).
34. PAPER/CASSETTE OUT INDICATOR FLASHES WHEN THERE IS PAPER IN CASSETTE.
Step 1. Cassette is improperly inserted. Insert correctly.
Step 2. Paper cassette OUT indicator misadjusted. Adjust indicator (paragraph 3-20.1).
Step 3. Cassette paper detector photocell is defective. Replace detector photocell (paragraph 3-20.5).
Step 4. Dc controller PC board is defective. Replace PC board (paragraph 3-20.10).
Step 5. Display PC board is defective. Replace PC board (paragraph 3-20.26).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
35. DEVELOPER OUT/WASTE DEVELOPER INDICATOR FLASHES EVEN THOUGH RESERVOIR CONTAINS ENOUGH DEVELOPER AND WASTE RECEPTACLE IS NOT FULL.	
Step 1. Cleaner overflow detector is covered by developer.	Clean detector (Table 3-4, PMCS 6).
Step 2. Cleaner overflow detector lamp is defective.	Replace lamp (paragraph 3-20.52).
Step 3. Dc controller PC board is defective.	Replace PC board (paragraph 3-20.10).
Step 4. Display PC board is defective.	Replace PC board (paragraph 3-20.26).
36. DEVELOPER OUT/WASTE DEVELOPER INDICATOR DOES NOT FLASH WHEN THERE IS NO DEVELOPER IN RESERVOIR OR WHEN IT IS OVERFLOWING IN CLEANER ASSEMBLY.	
Step 1. Developer reservoir detector is covered by developer.	Clean reservoir (paragraph 3-20.28).
Step 2. Developer reservoir detector is defective.	Replace detector (paragraph 3-20.24).
Step 3. Cassette paper detector photocell is defective.	Replace detector photocell (paragraph 3-20.5).
Step 4. Dc controller PC board is defective.	Replace PC board (paragraph 3-20.10).
Step 5. Display PC board is defective.	Replace PC board (paragraph 3-20.26).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
37. COPIER CONTINUES PRODUCING COPIES AFTER SELECTED NUMBER HAS BEEN MADE.	
Step 1. Dc controller PC board is defective.	Replace PC board (paragraph 3-20.10).
Step 2. Keypad unit is defective.	Replace keypad (paragraph 3-20.25).
38. TOTAL COUNTER DOES NOT OPERATE.	
Step 1. Counter CNT1 is defective.	Replace counter (paragraph 3-20.27).
Step 2. Dc controller PC board is defective.	Replace PC board (paragraph 3-20.10).
39. CONTINUOUS PAPER JAMS IN CASSETTE FEED AREA.	
Step 1. Copy paper is curling or otherwise deformed.	Replace paper.
Step 2. Copy paper is not square in cassette.	Adjust paper in cassette.
Step 3. Copy paper is not under metal tab in cassette.	Adjust paper in cassette.
Step 4. Cassette springs are weak.	Replace cassette springs (paragraph 3-20.49).
Step 5. Cassette is improperly inserted.	Reinsert cassette.
Step 6. Paper feed clutch spring is defective.	Replace spring (paragraph 3-20.12).

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
40. CONTINUOUS PAPER JAM WHEN USING MANUAL FEED.	
Step 1. Copy paper is deformed.	Replace paper.
Step 2. Paper feed roller is dirty.	Clean feed roller.
Step 3. Clutch spring and action spring are deformed.	Replace spring (paragraph 3-20.13).
41. CONTINUOUS PAPER JAMS IN SEPARATION/TRANSPORT AREA.	
Step 1. Separation belt is broken.	Replace belt (paragraph 3-20.57).
Step 2. Separation roller is worn.	Replace roller (paragraph 3-20.56).
Step 3. Registration roller is dirty.	Clean roller.
Step 4. Registration clutch spring and action spring are worn.	Replace spring (paragraph 3-20.14).
Step 5. Static charge eliminator not in place.	Reinstall correctly.
Step 6. Paper deflection rowel bent or missing.	(a) Reform rowel. (b) Replace rowel.

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
42. CONTINUOUS PAPER JAMS IN FIXING/DELIVERY AREA.	
Step 1. Leading blank edge is misadjusted.	Adjust RS2 (paragraph 3-20.31).
Step 2. Paper guide is dirty.	Clean guide.
Step 3. Separation claw is broken.	Replace claw (paragraph 3-20.55).
43. POOR SEPARATION.	
Step 1. Copy paper type is incorrect.	Replace paper.
Step 2. Oil pan level incorrect.	Install correct amount of oil (one bottle or half full tray).
Step 3. Oil pan applicator worn or dirty.	(a) Clean applicator (Table 3-4, PMCS 7). (b) Replace applicator (Table 3-4, PMCS 7).
44. WRINKLED COPY.	
Step 1. Copy paper is wrinkled.	Replace with new paper.
Step 2. Improper paper feed.	Replace cassette.

Table 3-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
44. WRINKLED COPY - Cont	
Step 3. Separation belt is dirty.	Clean belt (Table 3-4, PMCS 5).
Step 4. Paper guide is stained by developer.	Clean guide.
Step 5. Fixing assembly top and bottom rollers are worn.	Replace rollers (paragraph 3-20.37).
Step 6. Machine not level.	Relevel machine.
45. DEVELOPER APPEARING WHERE NOT DESIRED.	Replace seals (paragraph 3-20.54).

3-20. MAINTENANCE PROCEDURES.

a. This section contains instructions covering direct/general support maintenance functions for the plain paper copier. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

INDEX

INDEX - Cont

INDEX - Cont

3-20.1 Adjust Paper/Cassette Out Indicator.

MOS: 35E, Special Electronic Devices Repairer

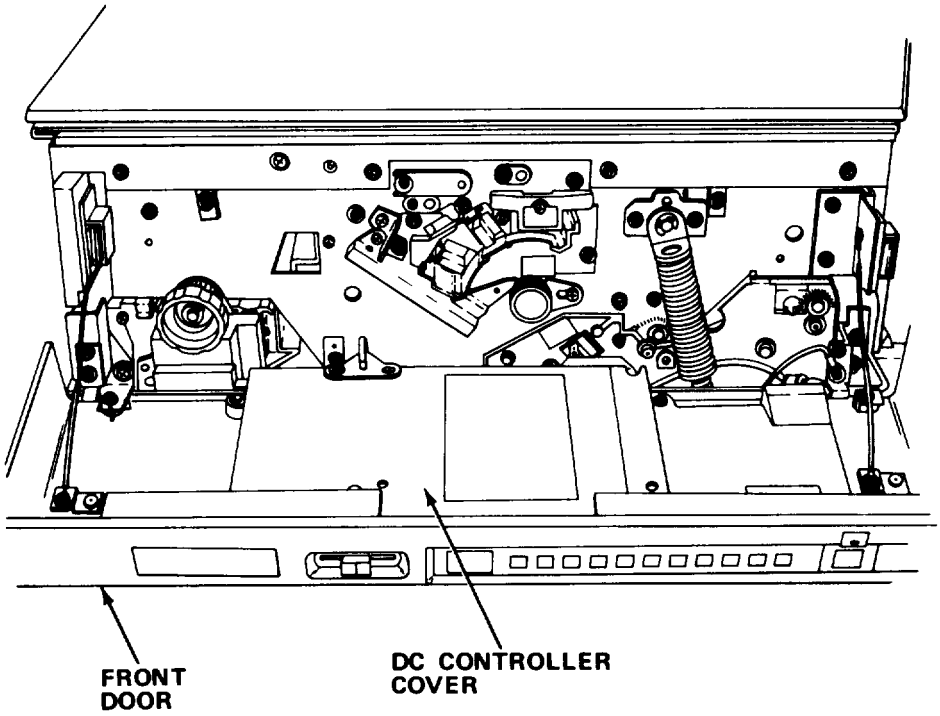
TOOLS: No. 2 Cross Tip Screwdriver
1/8 in. x 2-1/2 in. Flat Tip Screwdriver
1/4 in. x 4 in. Flat Tip Screwdriver

SUPPLIES: Rubber Matting

WARNING

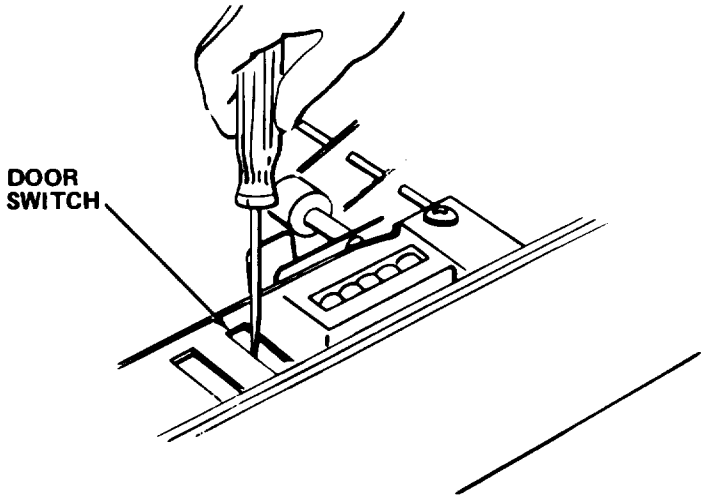
Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury could result.

a. Turn power switch to 1 (ON).



b. Open front door.

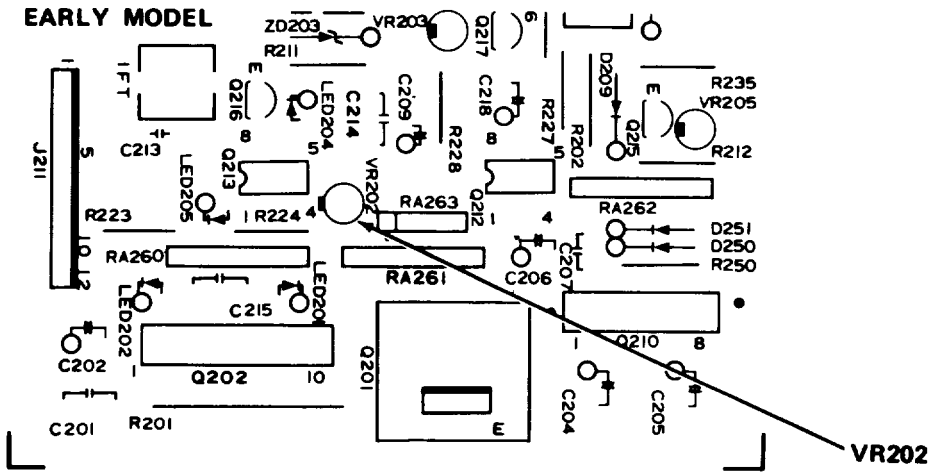
c. Remove dc controller cover.



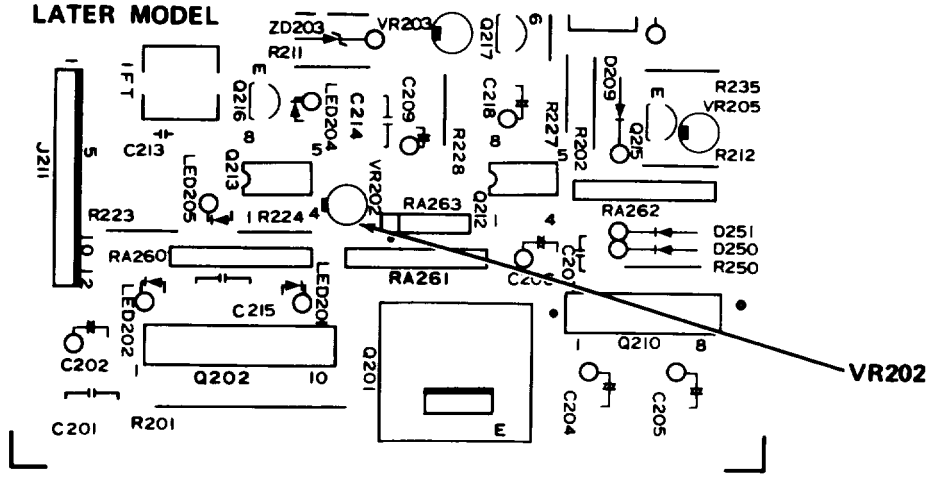
d. Insert and hold down screwdriver in door switch.

e. Insert empty cassette into copier. PAPER/CASSETTE OUT indicator should flash.

DC CONTROLLER
EARLY MODEL



DC CONTROLLER
LATER MODEL



NOTE

Early model and late model DC controller PC boards are interchangeable.

f. If PAPER/CASSETTE OUT indicator does not flash, adjust VR202 until indicator begins to flash.

g. Remove cassette.

h. Place a single sheet of thinnest paper to be used into cassette.

i. Insert cassette into copier. PAPER/CASSETTE OUT indicator should go out.

j. If PAPER/CASSETTE OUT indicator does not go out, readjust VR202 until it does.

NOTE

It may be necessary to repeat steps f. through j. to obtain proper indications.

k. Remove screwdriver and reinstall DC controller cover.

l. Close front door.

m. Turn power switch to O (OFF).

3-20.2 Adjust Platen Forward Clutch Initial Voltage.

MOS: 35E, Special Electronic Devices Repairer

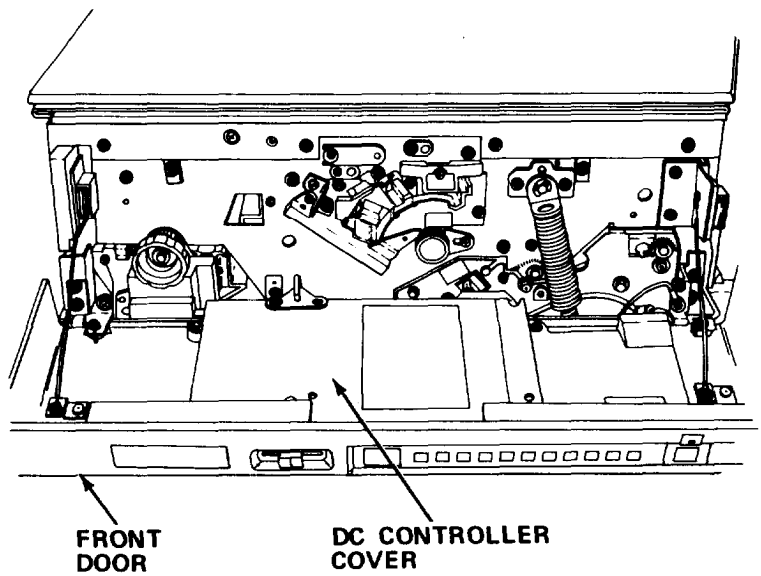
TOOLS: No. 2 Cross Tip Screwdriver
1/8 in. x 2-1/2 in. Flat Tip Screwdriver
1/4 in. x 4 in. Flat Tip Screwdriver
Multimeter

SUPPLIES: Rubber Matting
Jumper Wire

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury could result.

a. Turn power switch to O (OFF).



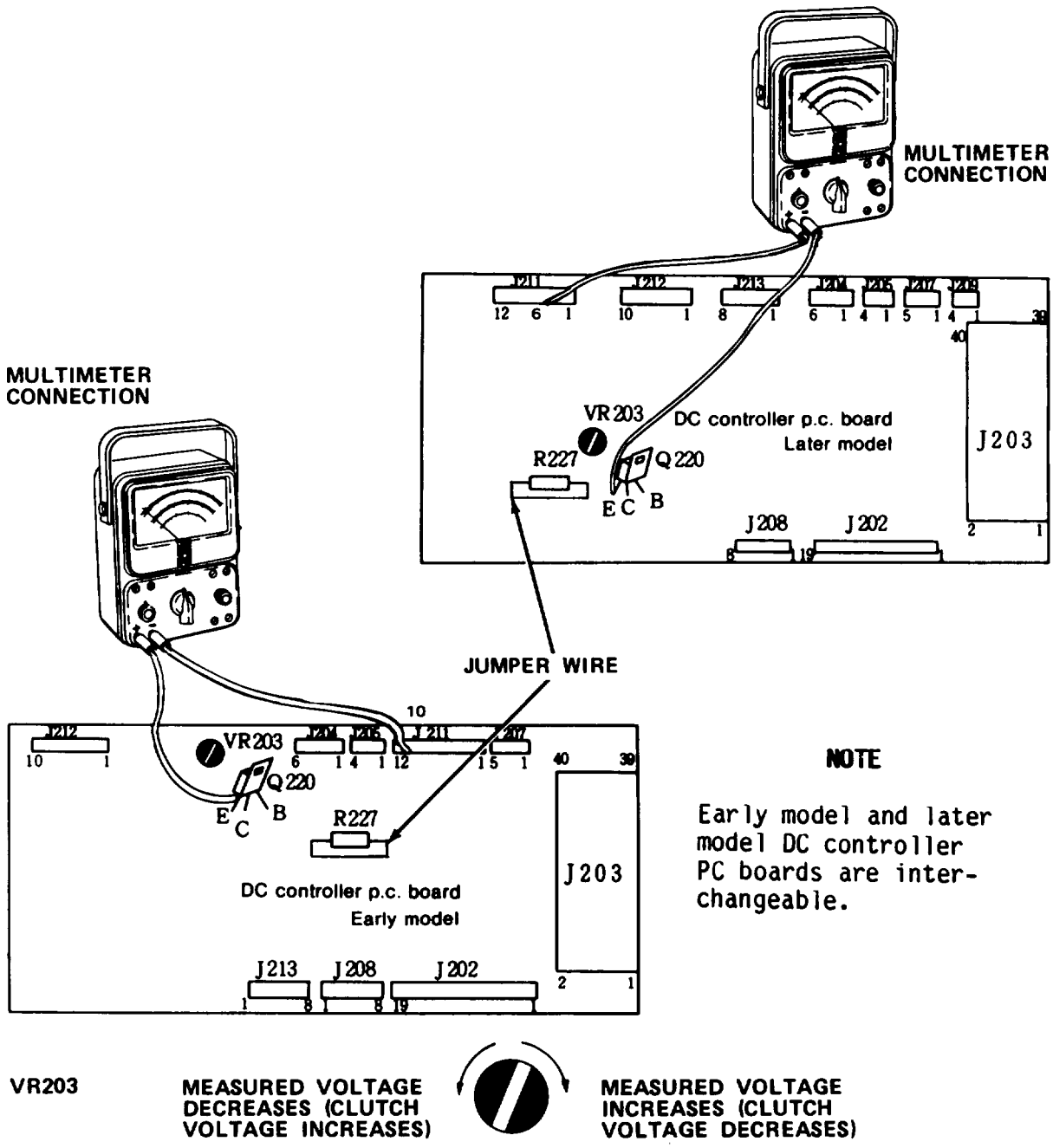
b. Open front door.

c. Remove dc controller cover.

d. Insert loaded cassette into copier.

e. Install jumper wire across R227 on the dc controller board.

f. Set multimeter to measure 24 V dc.

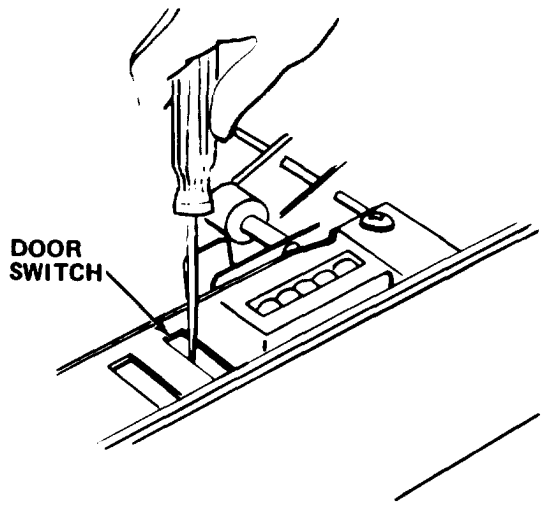


NOTE

Early model and later model dc controller PC boards are interchangeable.

g. Connect negative lead of multimeter to J211-6 or J211-10.

h. Connect positive lead of multimeter to emitter (E) of Q220.



i. Insert and hold down screwdriver in door switch and turn power switch to 1 (ON).

j. Adjust VR203 for meter indication of 12 V when platen is moving forward.

k. Turn power switch to O (OFF) and remove screwdriver from door switch.

1. Remove cassette.

m. Remove multimeter leads and jumper wire.

n. Reinstall dc controller cover.

o. Close front door.

3-20.3 Adjust Halogen Lamp Intensity.

MOS: 35E, Special Electronic Devices Repairer

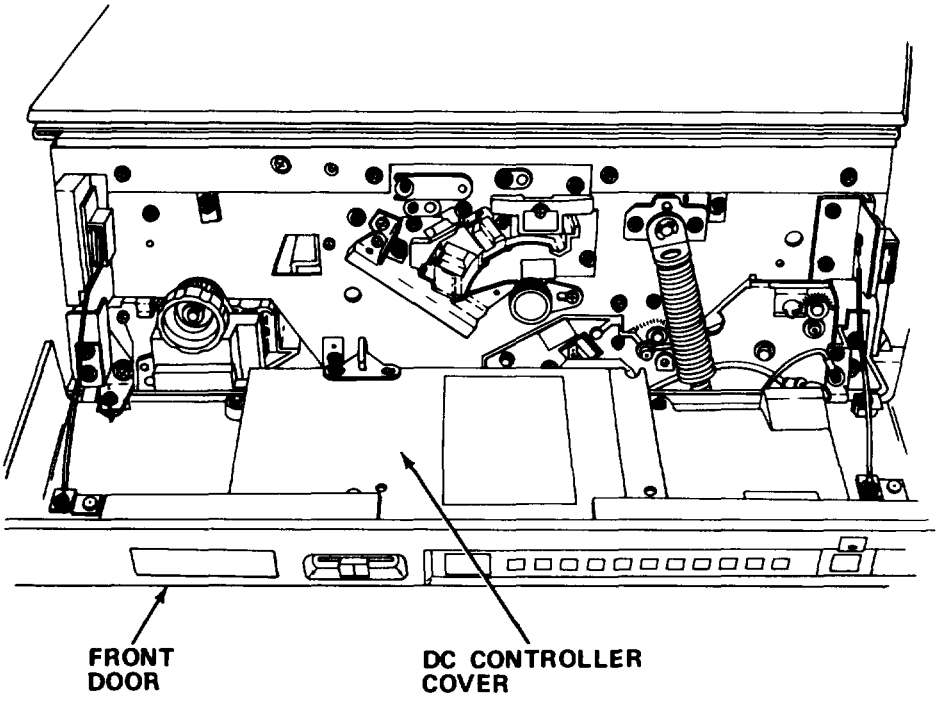
TOOLS : No. 2 Cross Tip Screwdriver
1/8 in. x 2-1/2 in. Flat Tip Screwdriver
1/4 in. x 4 in. Flat Tip Screwdriver

SUPPLIES: Rubber Matting
Jumper Wire
NA Test Sheet

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury could result.

a. Turn power switch to O (OFF).

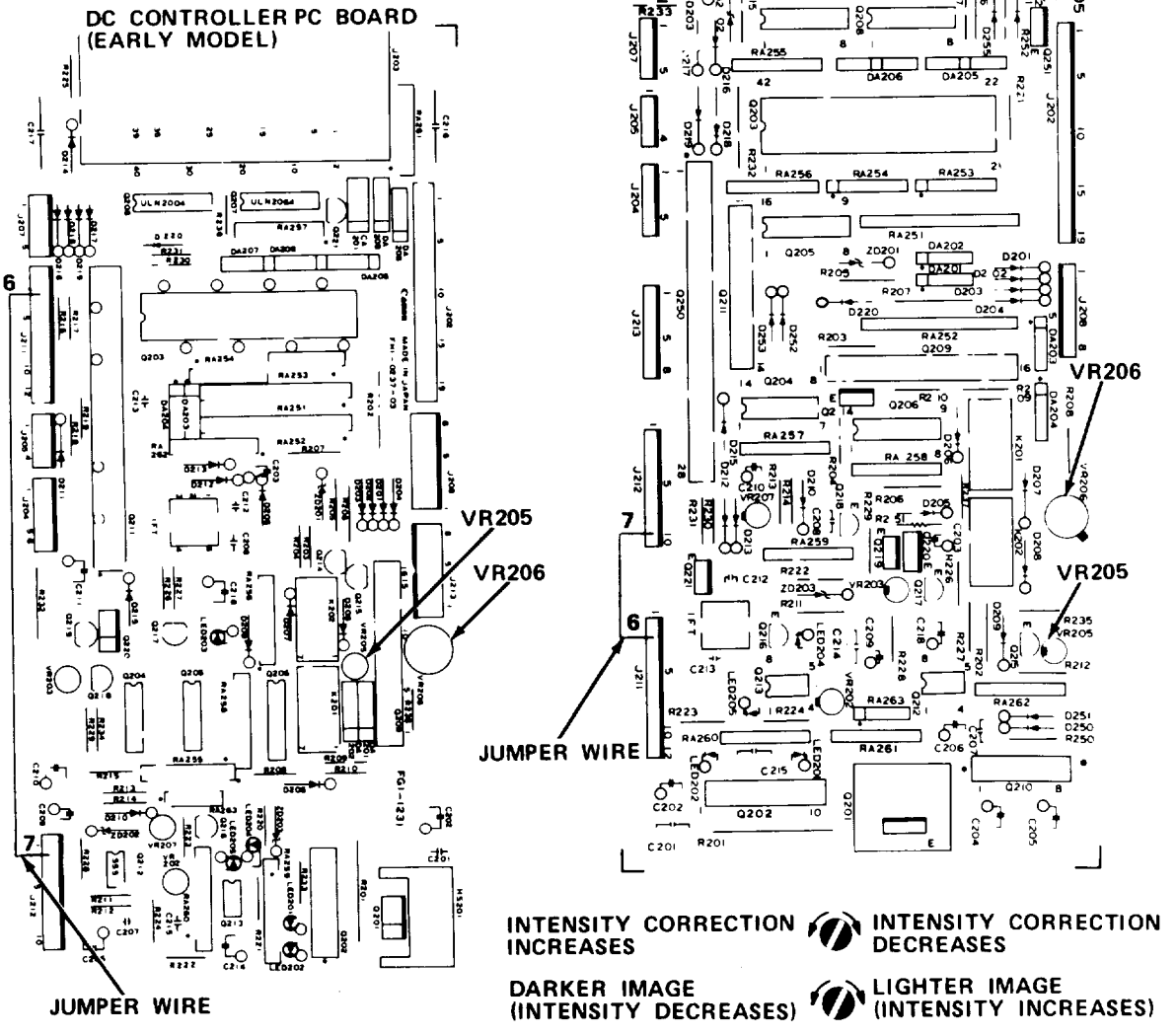


b. Open front door.

c. Remove dc controller cover.

d. Insert loaded cassette into copier.

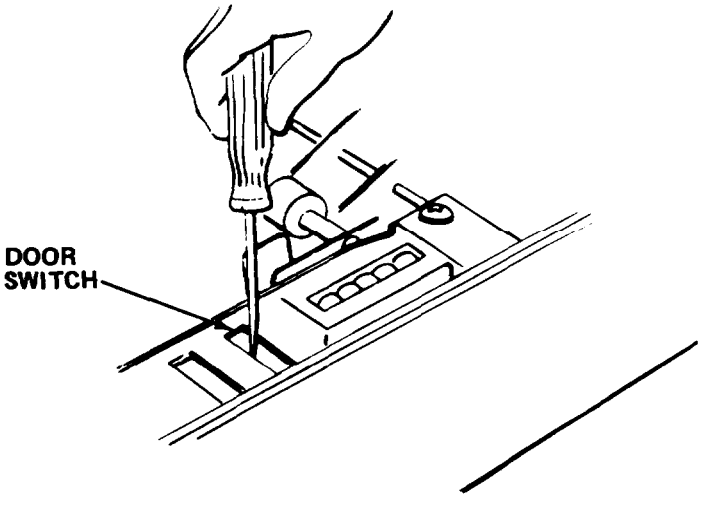
ADJUST HALOGEN LAMP INTENSITY. (Cont)



NOTE

Early model and later model dc controller PC boards are interchangeable.

e. Connect jumper wire from J212-7 to J211-6 (ground).



f. Insert and hold down screwdriver in door switch.

g. Turn power switch to 1 (ON).

h. Place NA test sheet on platen.

i. Set exposure control lever to 5.

j. Set copy number display to 18 via key strip.

k. Press COPY START after WAIT/STANDBY indicator stops flashing.

l. Adjust VR206 so that gray scale number 10 is invisible and number 9 can be seen on the twelfth and later copies.

m. Set exposure control lever to 2.

n. Set copy number display to 10.

o. Press COPY START key.

p. Take tenth copy and mark it sample A.

q. Turn power switch to O (OFF).

r. Disconnect jumper wire from J211-6 and connect to J211-8 (24 V).

s. Turn power switch to 1 (ON).

t. Set exposure control lever to 5.

u. Set copy number display to 3.

v. Press COPY START key after WAIT/STANDBY indicator stops flashing.

w. Adjust VR205 until same density as that of sample A is obtained.

x. Turn power switch to O (OFF); then disconnect jumper wire.

y. Turn power switch to 1 (ON).

z. Set copy number to 5.

aa. Wait three minutes.

ab. Press COPY START key.

ac. Adjust VR205 carefully so that same density is obtained for first and tenth copies.

ad. Repeat steps z through ac as necessary.

ae. Make a single copy. If it is different from the copy made in step 12, carefully adjust VR206 as necessary.

af. Remove screwdriver from door switch and turn power switch to O (OFF).

ag. Reinstall dc controller cover.

ah. Close front door.

3-20.4 Adjust Platen Brake.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver
1/8 in. x 2-1/2 in. Flat Tip Screwdriver
1/4 in. x 4 in. Flat Tip Screwdriver
Machinist's Rule

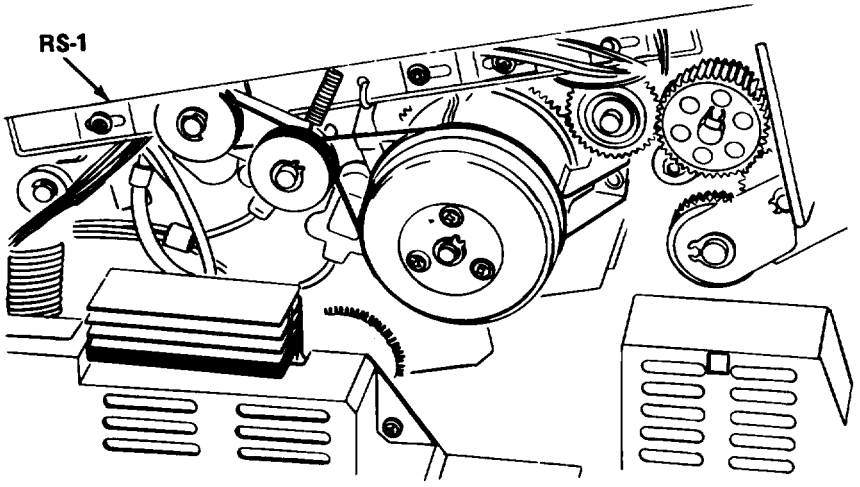
SUPPLIES: Rubber Matting

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury could result.

a. Turn power switch to O (OFF).

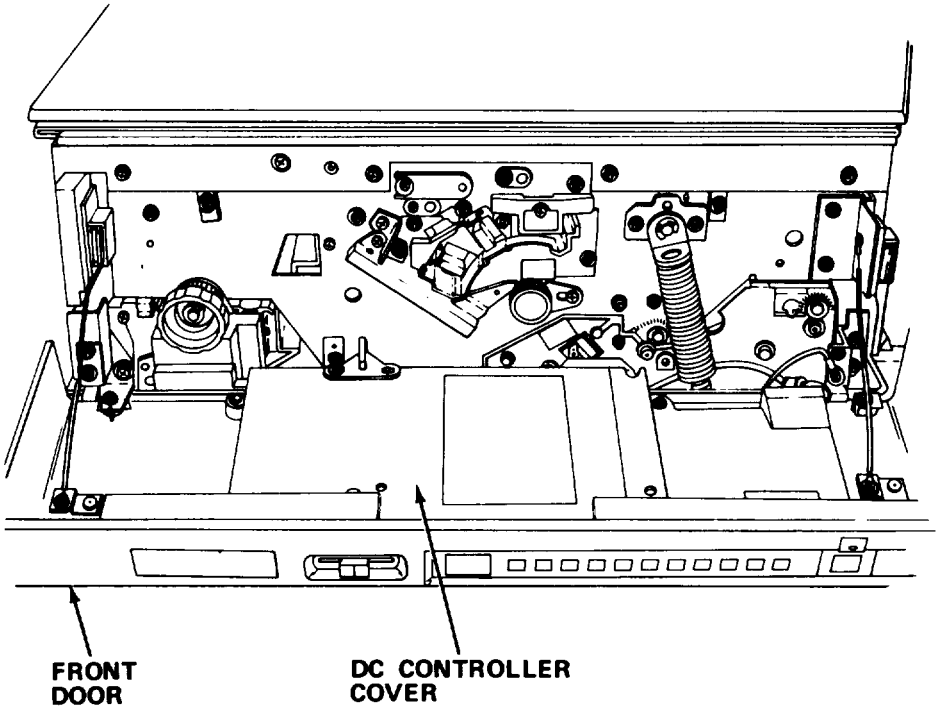
b. Remove upper rear panel.



c. Check that reed switch RS1 mounting screw is at center of slot.

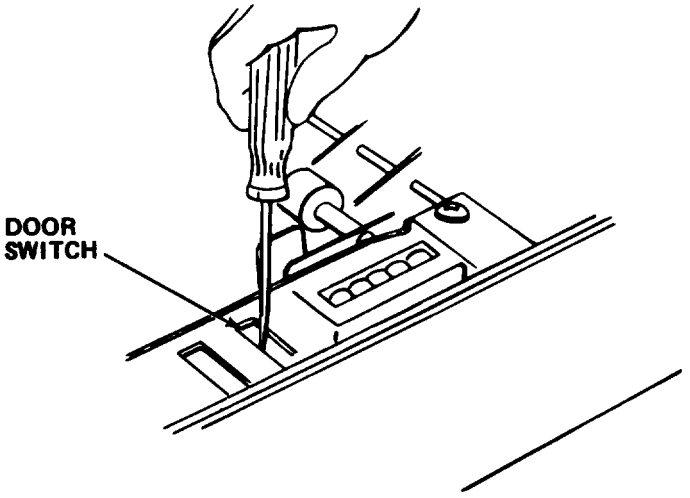
d. Turn power switch to 1 (ON).

e. Attach manual feed tray.



f. Open front door.

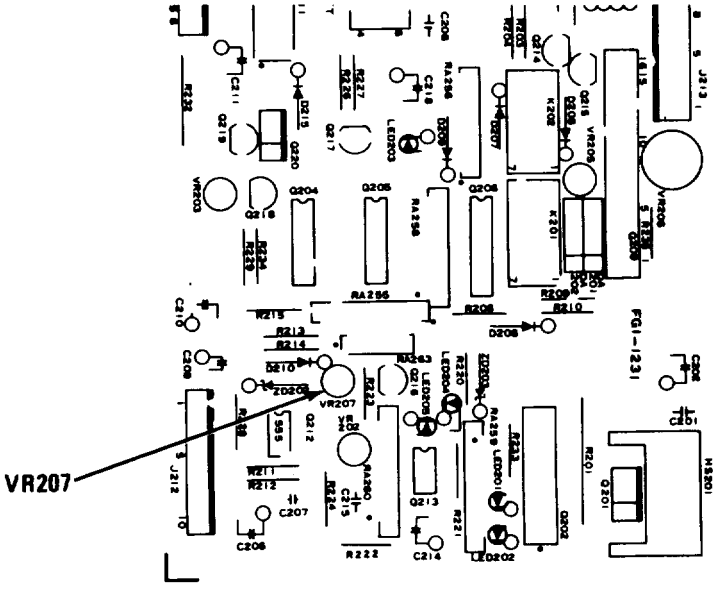
g. Remove dc controller cover.



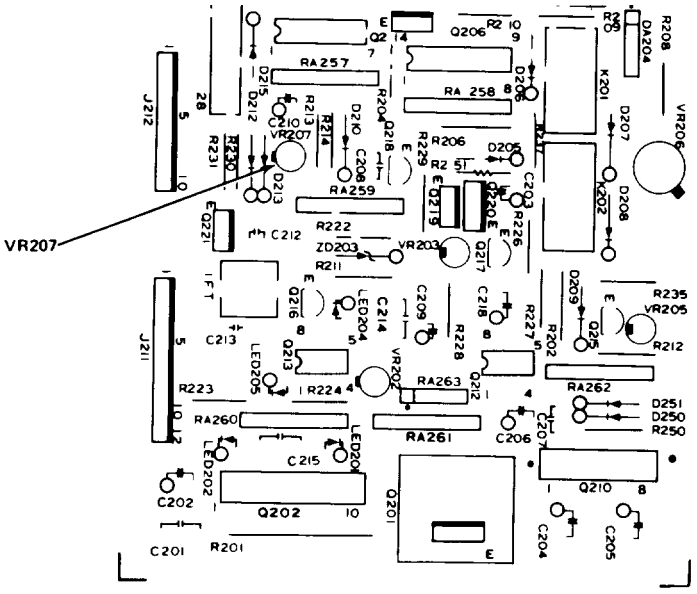
h. Insert and hold down screwdriver in door switch.

i. Insert small size copy in manual feed tray.

DC CONTROLLER PC BOARD
(EARLY MODEL)



DC CONTROLLER PC BOARD
(LATER MODEL)



NOTE

Early model and later model dc controller PC boards are interchangeable e.

j. Adjust VR207 so that platen stops with no more than 20 mm (.79 in.) overhang at one end or other.

k. Remove screwdriver from switch and turn power switch to O (OFF).

l. Reinstall dc controller cover.

m. Close front door.

n. Reinstall upper rear panel.

3-20.5 Replace Cassette Paper Detector Photocell.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver (3 in.)

SUPPLIES: Photocell
Pencil

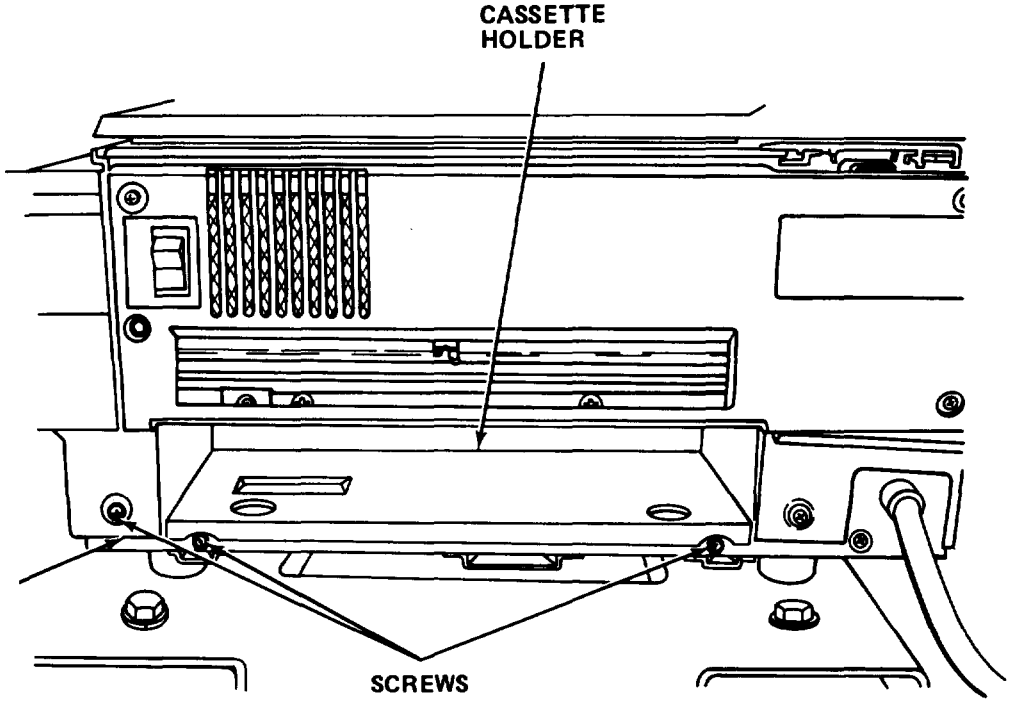
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

b. Unplug power cord.

c. Remove cassette and manual paper feed guide.

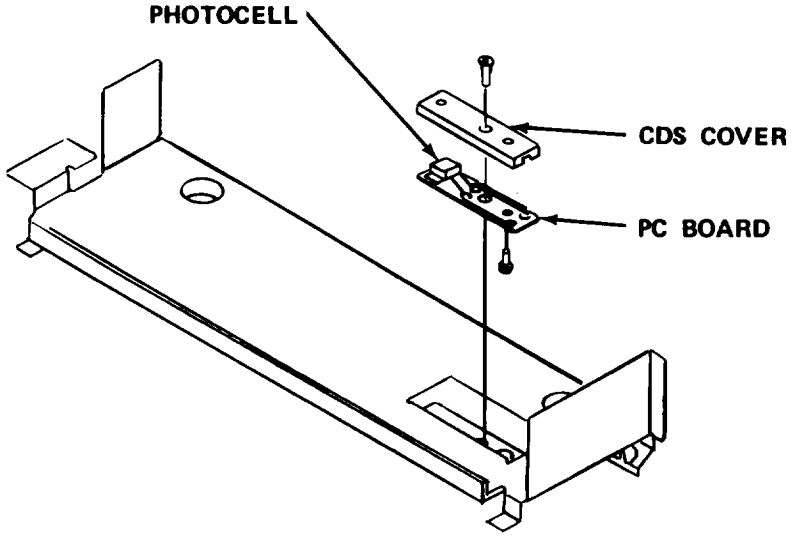


d. Mark position of cassette holder with pencil.

e. Remove fastening screws.

f. Withdraw cassette holder.

g. Unplug connector J52.



h. Remove CdS cover.

i. Remove detector photocell from pc board.

j. Install new detector photocell on pc board.

k. Reinstall CdS cover.

l. Reconnect J52.

m. Insert cassette holder.

n. Aline cassette holder with alinement mark.

o. Reinstall fastening screws.

p. Reinstall manual paper feed guide and cassette.

q. Plug in power cord.

r. Turn power switch to 1 (ON).

3-20.6 Replace Cassette Paper Detection Bulb.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Cross Tip Screwdriver (8 in.)

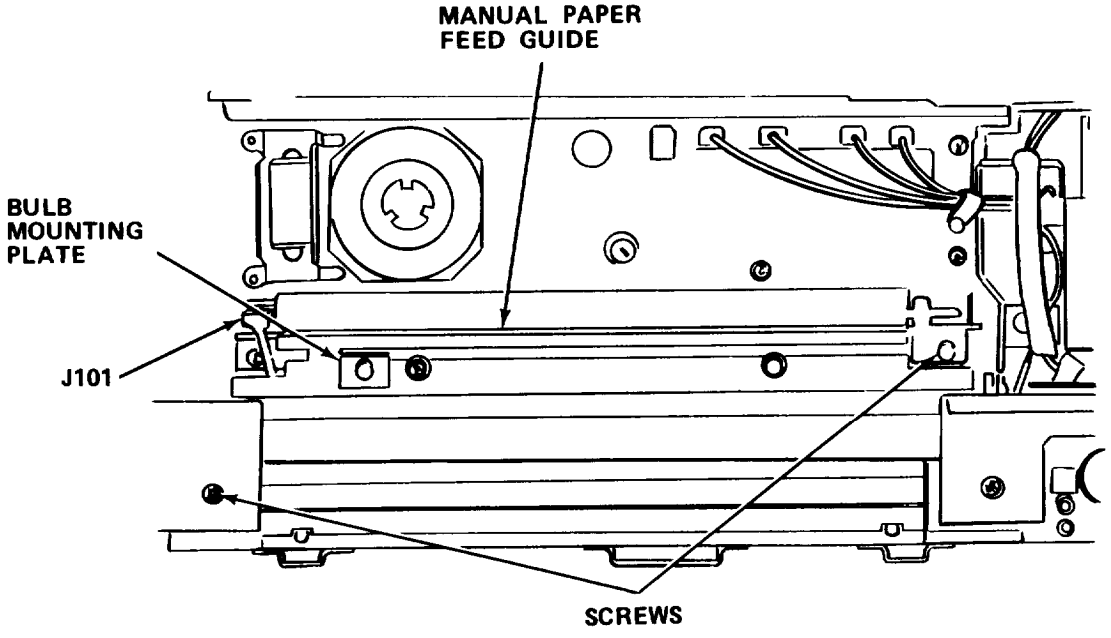
SUPPLIES: 24 V 90 mA Bulb

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

b. Unplug power cord.



c. Remove upper right panel.

d. Unplug connector J101.

e. Remove two fastening screws.

f. Open front door, then remove manual paper feed guide (upper and lower guide plates).

g. Remove bulb mounting plate.

h. Remove defective bulb.

i. Install new bulb.

j. Reinstall bulb mounting plate.

k. Reinstall paper feed guide (upper and lower guide plates) and secure with fastening screws.

l. Reconnect J101.

m. Reinstall upper right panel.

n. Close front door.

o. Plug in power cord.

p. Turn power switch to 1 (ON).

3-20.7 Replace ac Driver PC Board.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Cross Tip Screwdriver (3 in.)
Flat Tip Screwdriver (4 in.)

SUPPLIES: ac Driver PC Board

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

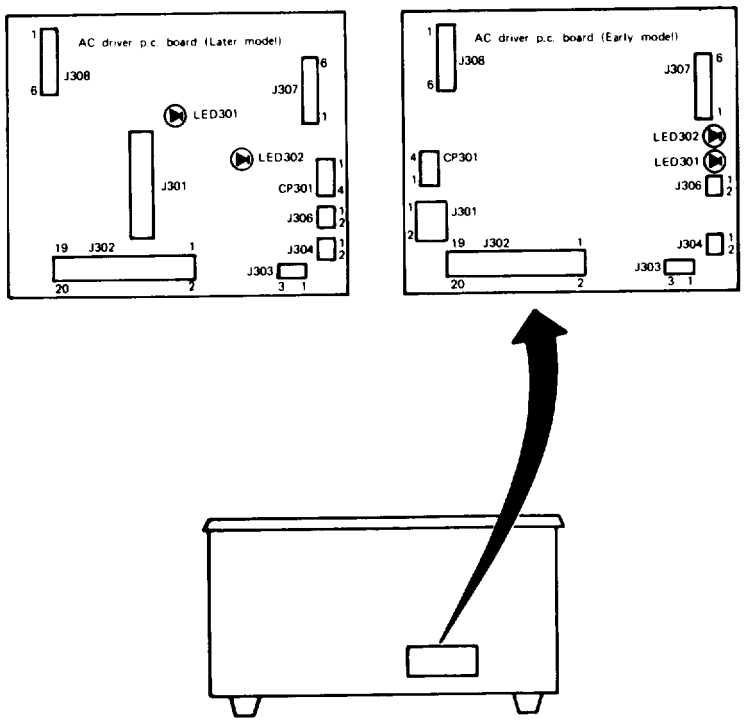
a. Turn power switch to O (OFF).

b. Unplug power cord.

c. Remove upper and lower rear panels and PC board panel.

NOTE

ac driver is center PC board.



d. Disconnect J301, J302, J303, J304, J306, J307, and J308.

e. Remove defective ac driver board.

f. Install new ac driver board.

g. Reconnect J301, J302, J303, J304, J306, J307, and J308.

h. Reinstall PC board panel and upper and lower rear panels.

i. Plug in power cord.

j. Turn power switch to 1 (ON).

3-20.8 Replace Power Switch.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver (3 in.)
Jeweler's Screwdriver Set

SUPPLIES: Power Switch

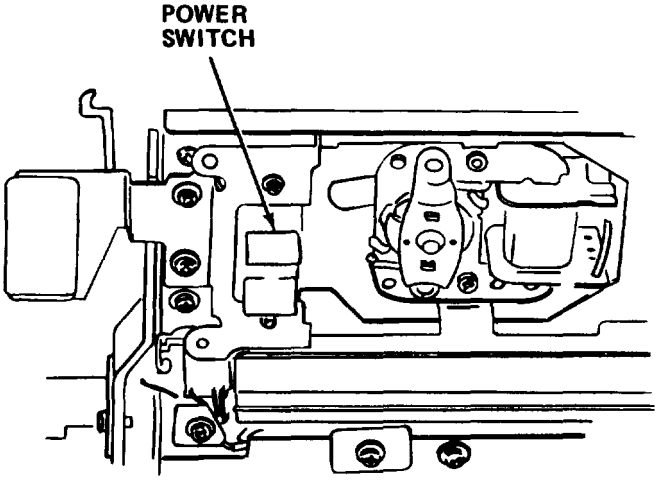
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

b. Unplug power cord.

c. Remove upper right panel.



d. Remove switch mounting hardware, and slowly withdraw power switch clear of bracket.

e. Tag and remove wires connected to power switch and discard switch.

f. Attach wires to new power switch.

g. Insert new power switch into bracket, remove tags, and attach mounting hardware.

h. Reinstall upper right panel.

i. Plug in power cord.

j. Turn power switch to 1 (ON).

3-20.9 Repl ace Main Motor.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver (3 in.)
Flat Tip Screwdriver (4 in.)
Needle Nose Pliers
1/4 in. Drive Socket Set

SUPPLIES: Main Motor

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

b. Unplug power cord.

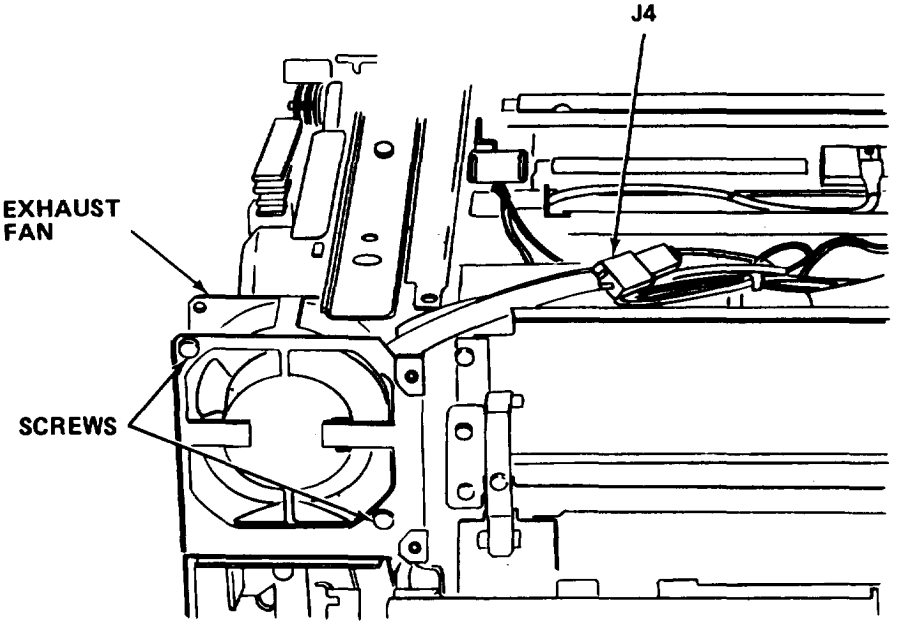
c. Open front door.

d. Remove paper tray.

e. Remove upper rear panel and upper left panel.

f. Slide platen to right. Remove top left panel.

g. Grasp latch (on left side of copier) and raise upper assembly to the full open position.

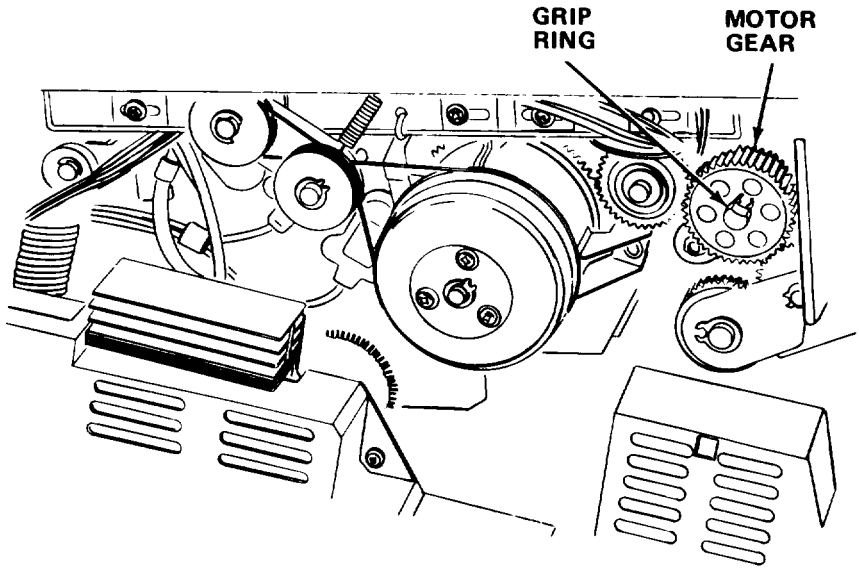


NOTE

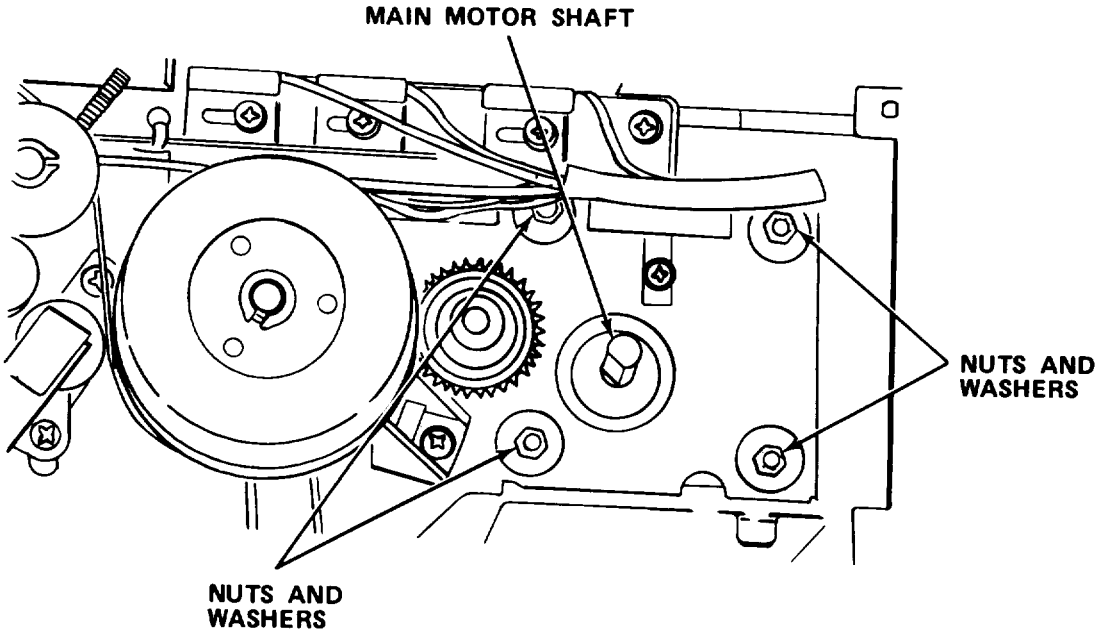
Same screws and nuts hold expanded mesh screen.

h. Remove fan mounting screws; then remove exhaust fan.

i. Unplug connector J4.



j. Release motor gear by removing grip ring, then pull off gear.



k. Remove nuts, metal washers, and rubber washers holding motor.

l. Remove screws on blower assembly. Move assembly toward motor and remove cable clamp.

m. Disconnect wires from starting capacitor, tag terminals, and unplug motor wires.

n. Remove main motor.

o. Install new main motor.

p. Reconnect main motor wiring.

q. Reinstall cable clamp, reposition blower assembly, and reinstall mounting screws.

r. Secure main motor by reinstalling nuts, metal washers, and rubber washers.

s. Reinstall motor gear and secure by installing grip ring.

t. Reinstall mesh screen and exhaust fan.

u. Reconnect plug J4.

v. Lower and latch upper assembly.

w. Reinstall upper rear panel, upper left panel, and top left panel.

x. Return platen to home position.

y* Plug in power cord.

z. Turn power switch to 1 (ON).

3-20.10 Replace dc Controller PC Board.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver (6 in.)

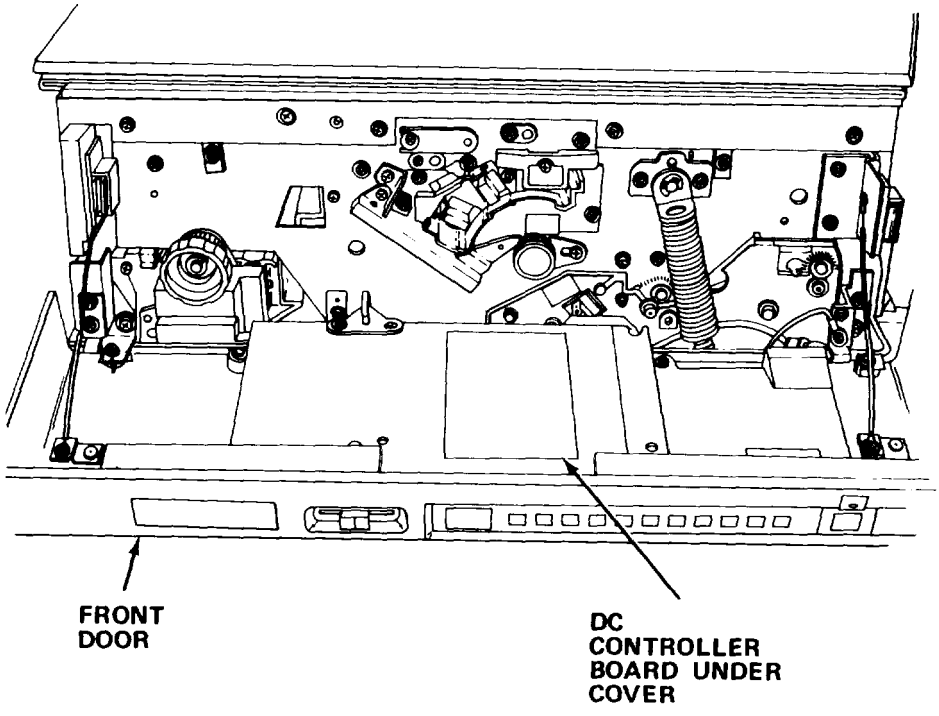
SUPPLIES: dc Controller PC Board

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

b. Unplug power cord.



c. Open front door.

d. Remove dc controller cover.

e. Tag and disconnect all cables.

f. Remove dc controller board.

g" Install new dc controller board.

h. Reinstall cables.

i. Reinstall dc controller cover.

j. Close front door.

k. Plug in power cord.

1. Turn power switch to 1 (ON).

3-20.11 **Replace High Voltage Cable(s).**

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver (6 in.)
Offset Cross Tip Screwdriver

SUPPLIES: High Voltage Cable(s)

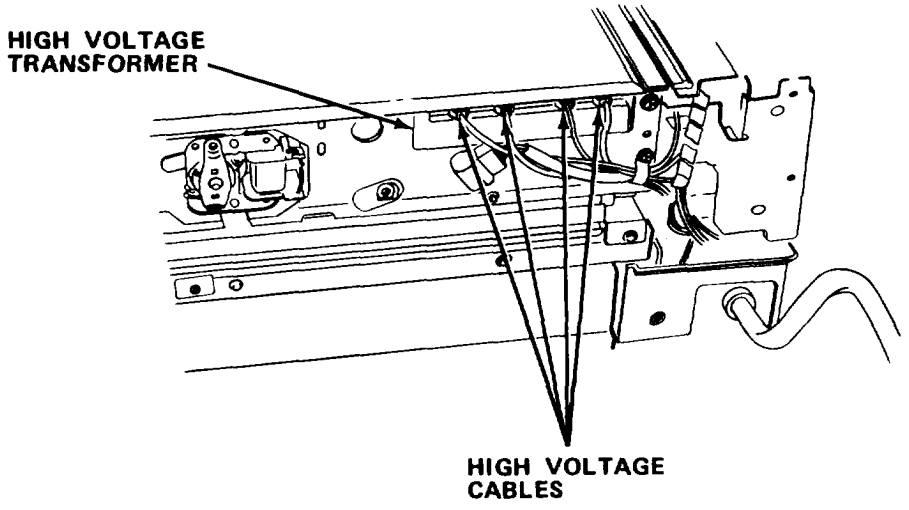
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

b. Unplug power cord.

c. Slide platen to left.

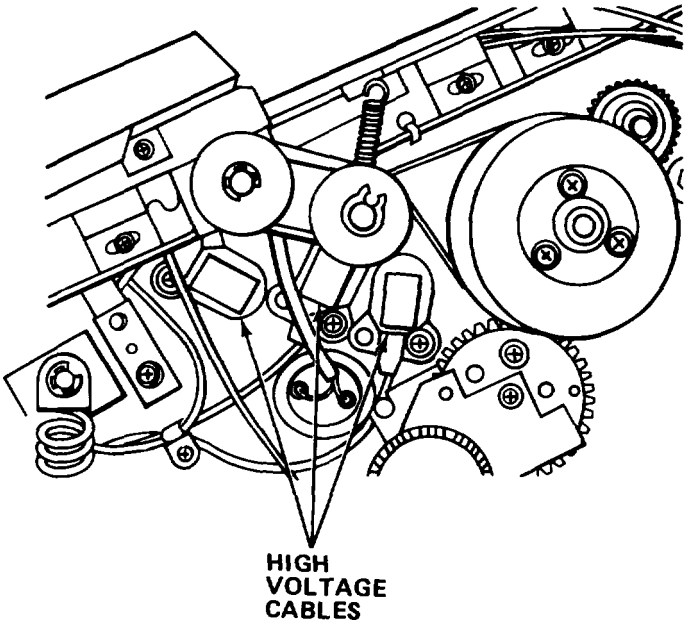


d. Remove top right cover, right side panel, rear panels and PC board panel.

e. Disconnect high voltage cable(s) from high voltage transformer.

f. Remove mounting screws from PC board assembly and tilt assembly away from copier.

g. Remove cable clamps from right and rear of machine.



h. Disconnect high voltage cable(s) from corona assembly.

i. Install new cable(s) on high voltage and corona assembly.

j. Reinstall cable clamps.

k. Reinstall mounting screws on PC board assembly.

l. Reinstall top right panel and right side panel, rear panels and PC board panel.

m. Return platen to home position.

n. Plug in power cord.

o. Turn power switch to 1 (ON).

3-20.12 Replace Paper Feed Clutch Spring.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Cross Tip Screwdriver
Grip Ring Pliers
Offset Cross Tip Screwdriver
Hex Head Key Wrench Set

SUPPLIES: Clutch Spring
General Purpose Oil (Item 14, Appendix E)

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

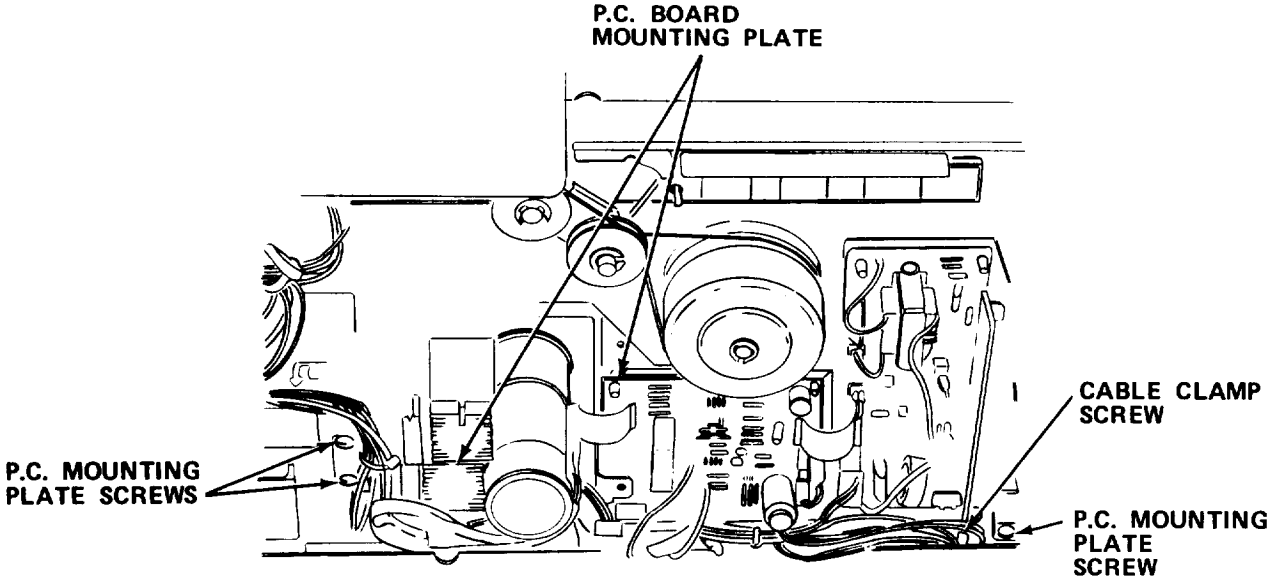
b. Unplug power cord.

c. Remove cassette.

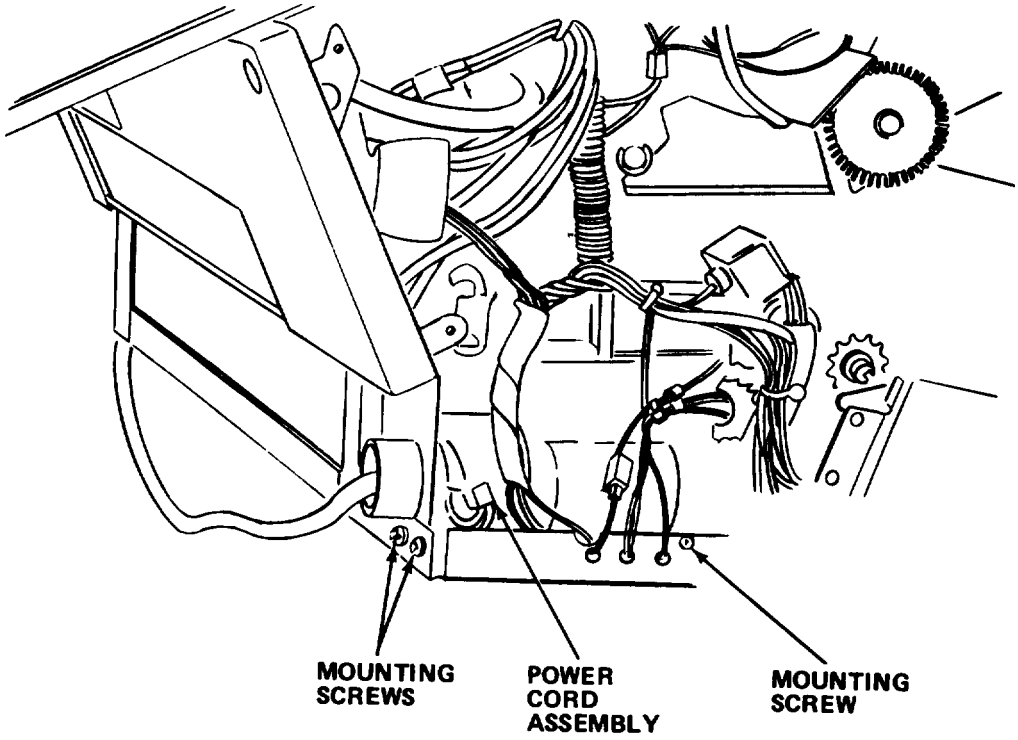
d. Slide platen to left.

e. Remove right top panel, upper rear panel, lower rear panel, and pc board panel.

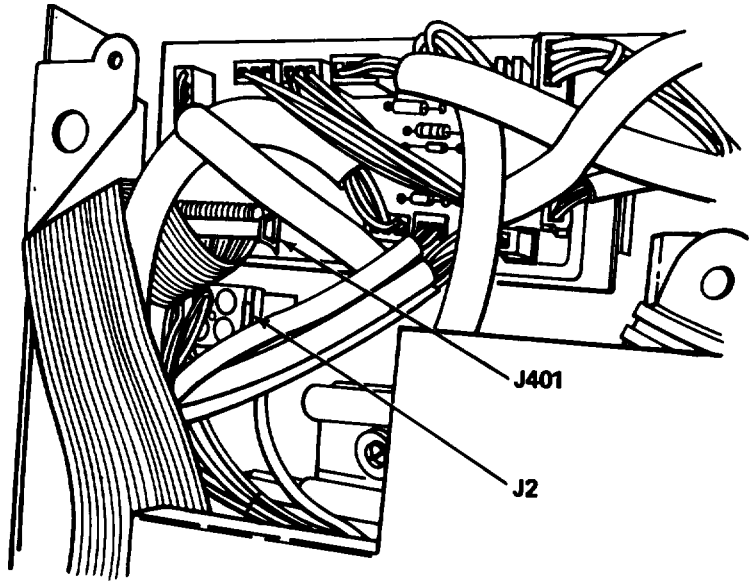
f. Open upper assembly to full open position.



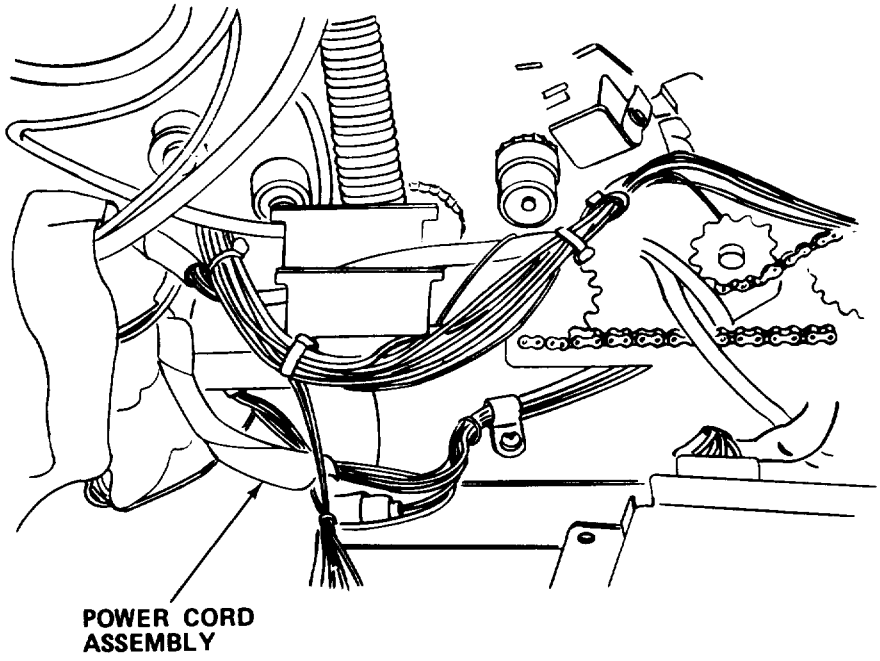
g. Remove pc mounting plate screws and cable clamp screw. Lay pc mounting plate on its side.



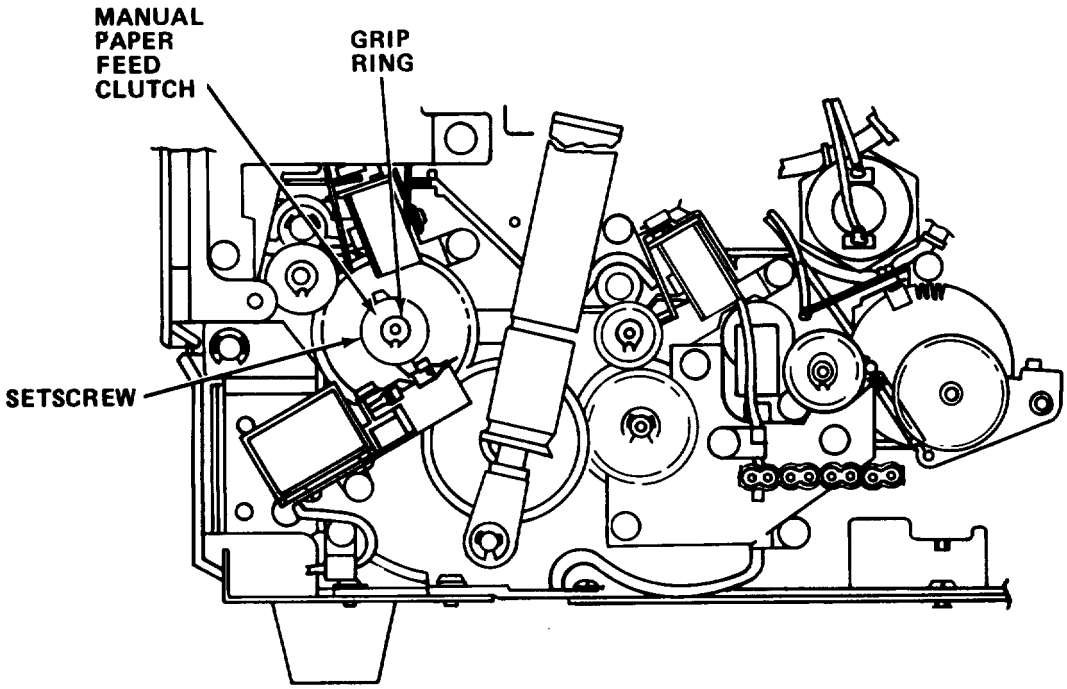
h. Remove mounting screws for power cord assembly and cable clamp.



i. Unplug connectors J401 and J2.



j. Pull down power cord assembly.



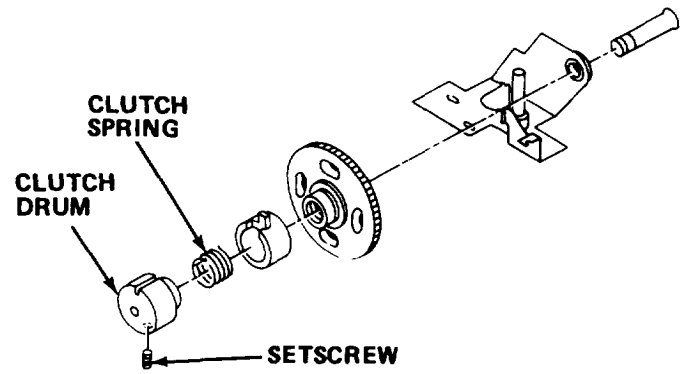
k. Remove grip ring from clutch sleeve.

1 Loosen setscrew on clutch drum.

NOTE

When removing clutch spring, turn gear to the right while removing spring.

m. Remove clutch drum.



n. Remove defective clutch spring.

o. Install new clutch spring and apply a drop or two of oil.

p. Reinstall clutch drum.

q. Tighten setscrew on clutch drum.

r. Reinstall grip ring.

s. Push up power cord assembly and reinstall cable clamp.

t. Reconnect J401 and J2.

u. Mount power cord assembly and cable clamp.

v. Reinstall mounting screws in pc board panel.

w. Reinstall right top panel, upper rear panel, and lower rear panel.

x. Close upper assembly.

y. Plug in power cord.

3-20.13 Replace Manual Paper Feed Clutch Spring.

MOS: 35E, Special Electronic Devices Repairer

TOOLS : Cross Tip Screwdriver
Grip Ring Pliers
Offset Cross Tip Screwdriver
Hex Head Key Wrench Set

SUPPLIES: Clutch Spring
General Purpose Oil (Item 14, Appendix E)

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

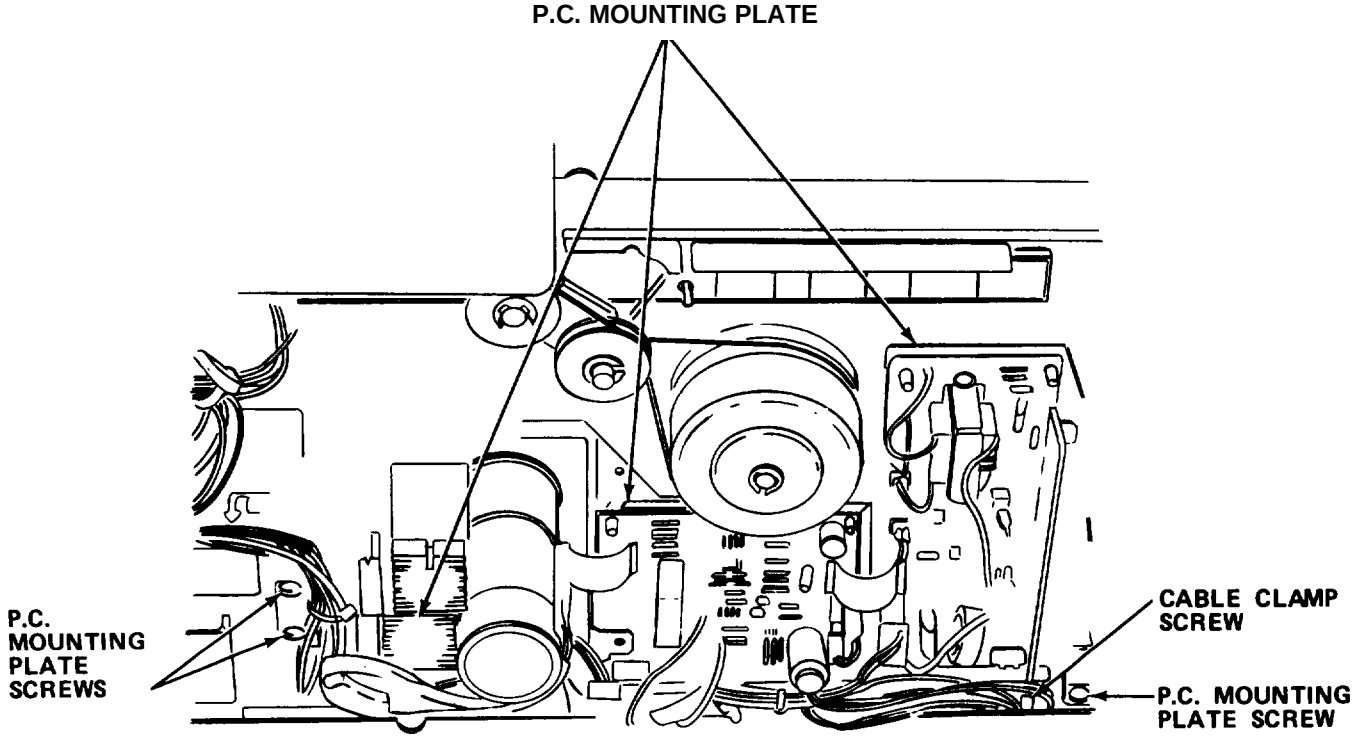
b. Unplug power cord.

c. Remove cassette.

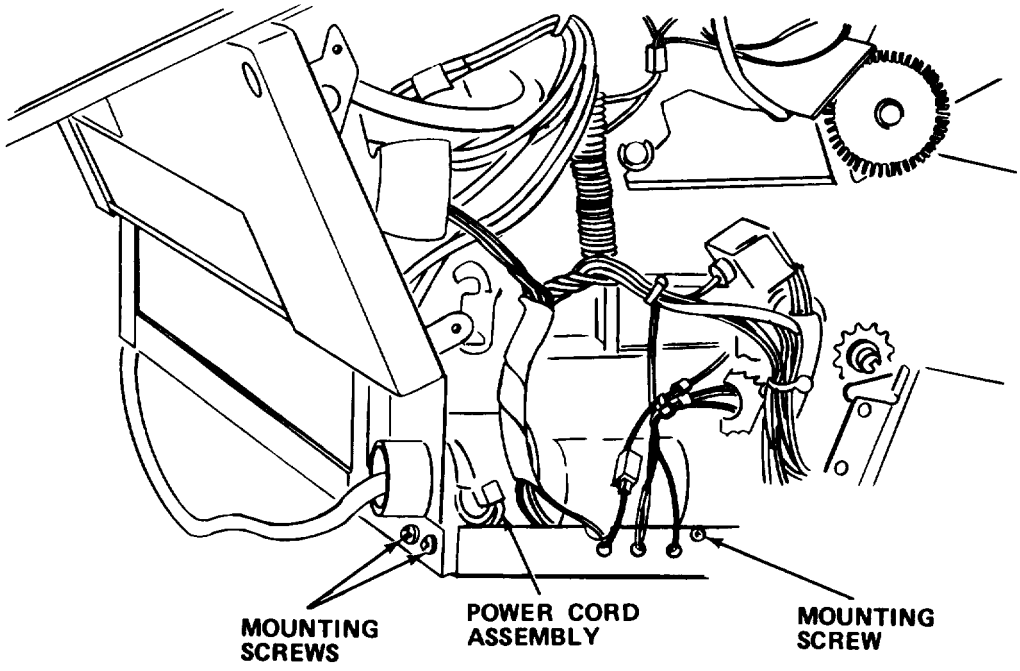
d. Slide platen to left.

e. Remove right top panel, upper rear panel, lower rear panel, and pc board panel.

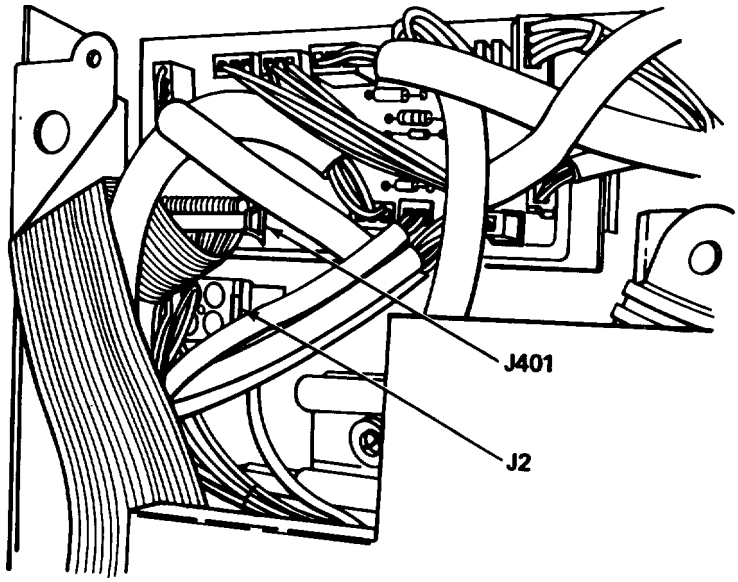
f. Open upper assembly to full open position.



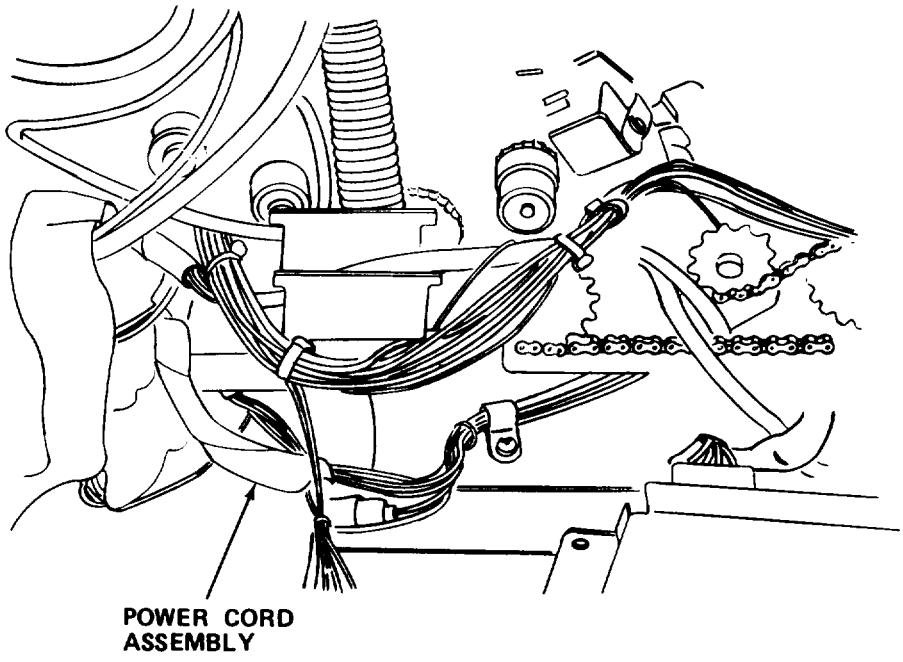
g. Remove pc mounting plate screws and cable clamp screw. Lay pc mounting plate on its side.



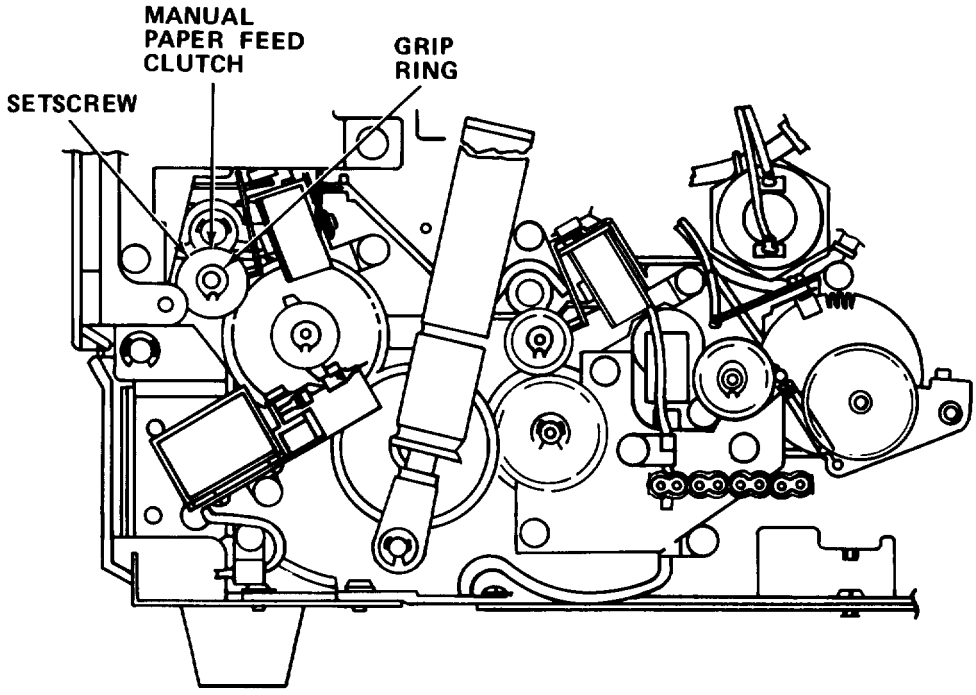
h. Remove mounting screws for power cord assembly and cable clamp.



i. Unplug connectors J401 and J2.



j. Pull down power cord assembly.



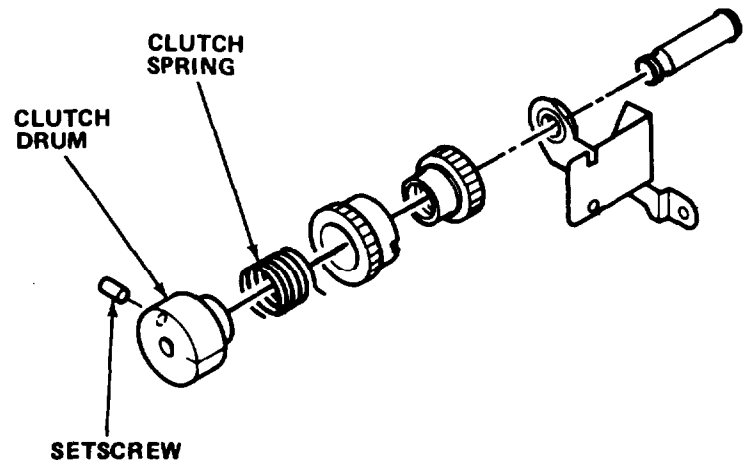
k. Remove grip ring from clutch sleeve.

1. Loosen setscrew of clutch drum.

NOTE

When removing clutch spring, turn gear to the right while removing spring.

m. Remove clutch drum.



n. Remove defective clutch spring.

o. Install new clutch spring and apply one or two drops of oil.

p. Reinstall clutch drum.

q. Tighten setscrew on clutch drum.

r. Reinstall grip ring.

s. Push up power cord assembly and reinstall cable clamp.

t. Reconnect J401 and J2.

u* Mount power cord assembly and cable clamp.

v. Reinstall mounting screws in pc board panel.

w. Reinstall upper right panel, upper rear panel, and lower rear panel.

x. Close upper assembly.

y. Plug in power cord.

3-20.14 Replace Registration Clutch Spring.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Cross Tip Screwdriver
Grip Ring Pliers
Offset Cross Tip Screwdriver
Hex Head Key Wrench Set

SUPPLIES: Clutch Spring
General Purpose Oil (Item 14, Appendix E)

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

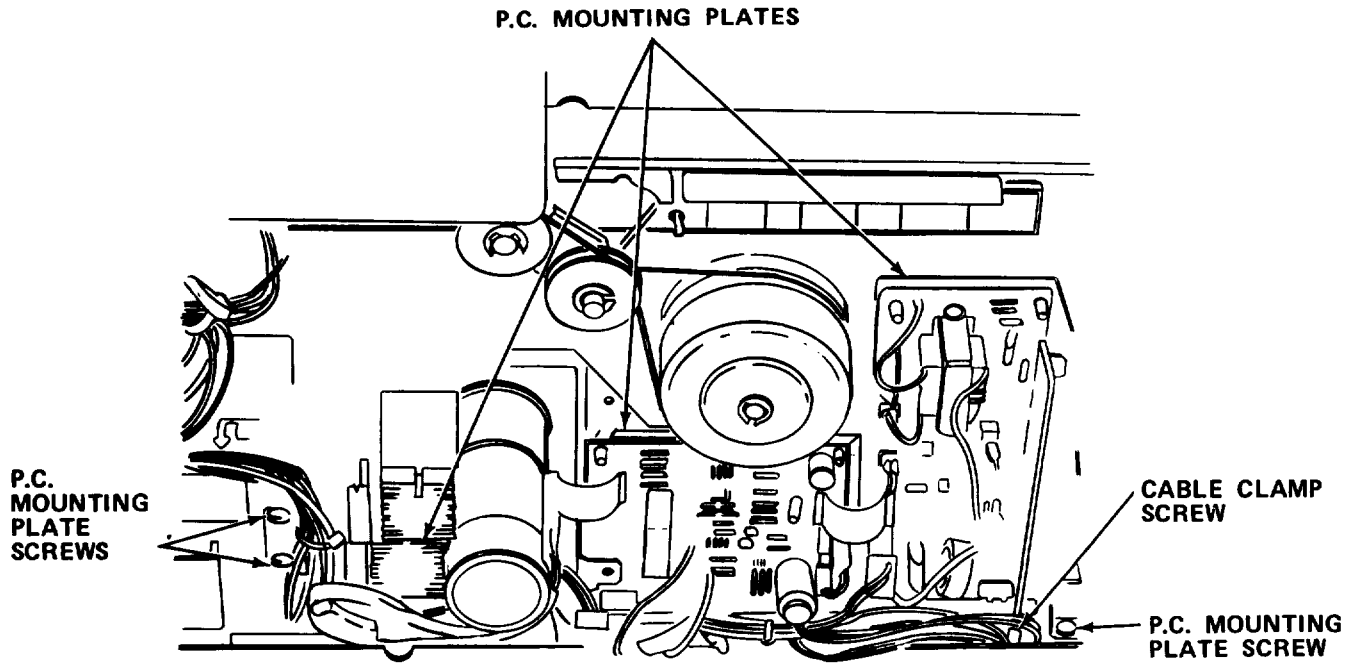
b. Unplug power cord.

c. Remove cassette.

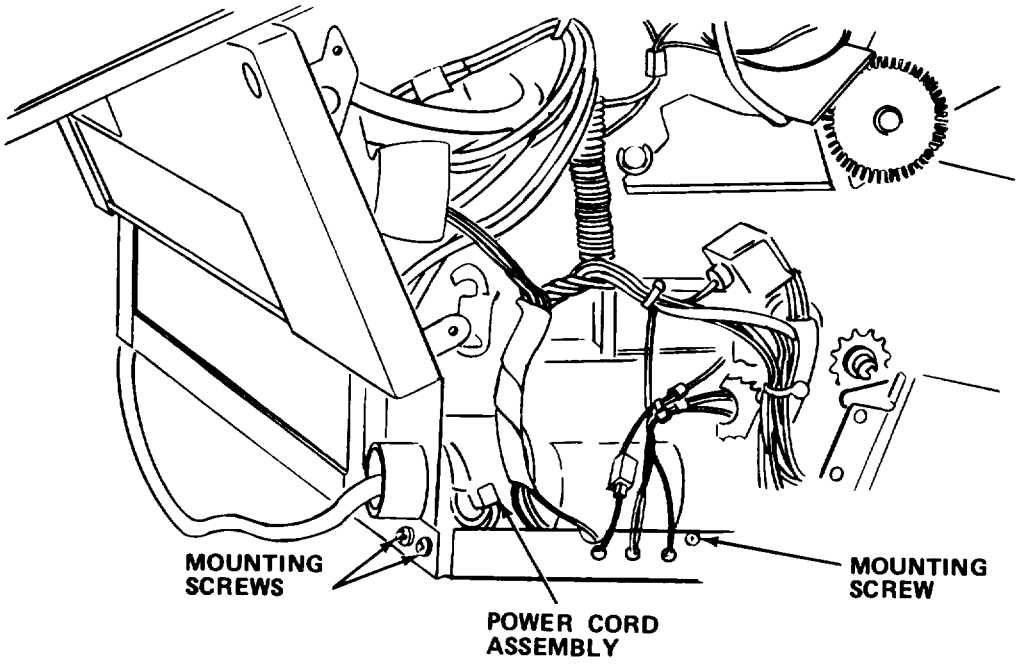
d. Slide platen to right.

e. Remove upper right panel, upper rear panel, lower rear panel, and pc board panel.

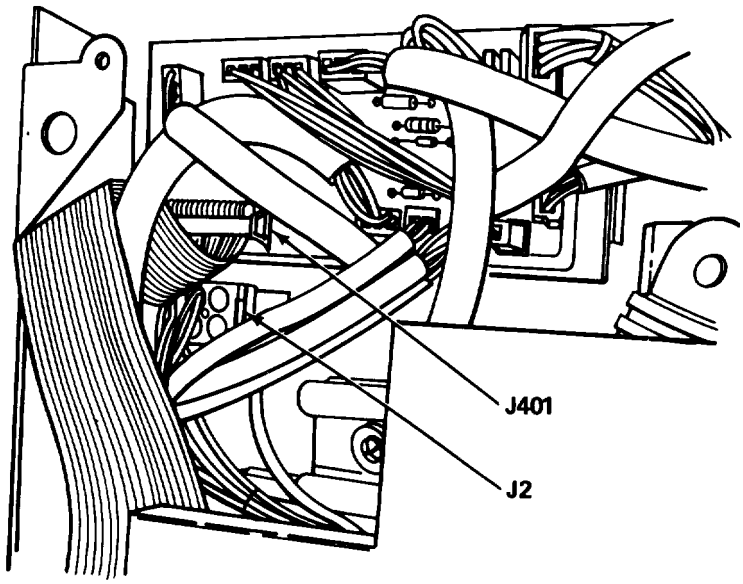
f. Open upper assembly to full open position.



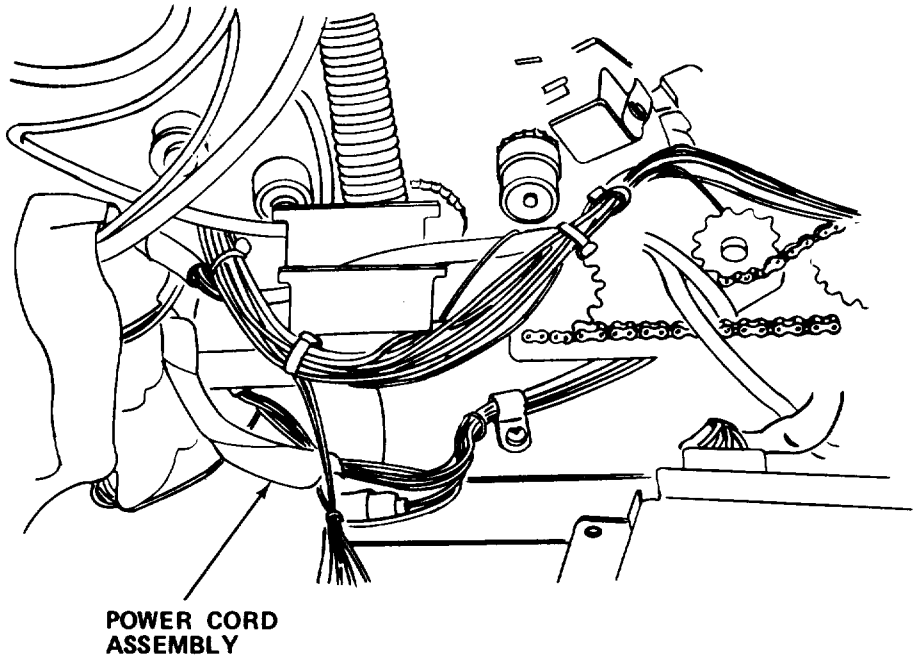
g. Remove pc mounting plate screws and cable clamp screw. Lay pc mounting plate on its side.



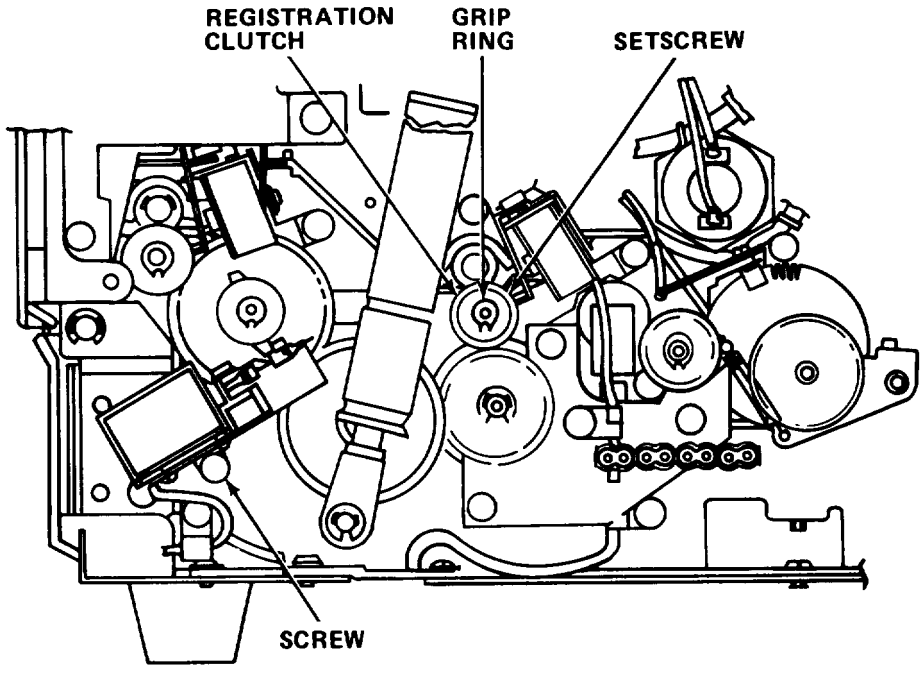
h. Remove mounting screws for power cord assembly and cable clamp.



i. Unplug connectors J401 and J2.



j. Pull down power cord assembly.



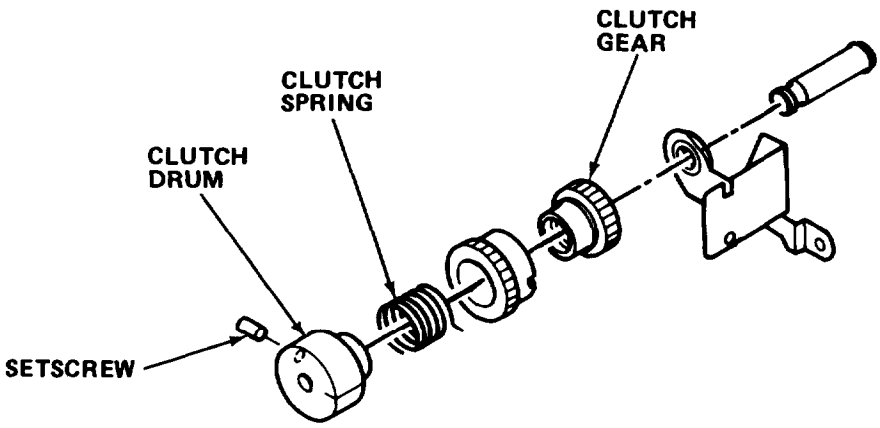
k. Remove grip ring from clutch sleeve.

1. Loosen setscrew of clutch drum.

NOTE

When removing clutch spring, turn gear to the right while removing spring.

m. Remove clutch drum.



n. Remove defective clutch spring.

o. Install new clutch spring and apply one or two drops of oil.

p" Reinstall clutch drum.

q. Tighten setscrew on clutch drum.

r. Reinstall grip ring.

s. Push up power cord assembly and reinstall cable clamp.

t. Reconnect J401 and J2.

u. Mount power cord assembly and cable clamp.

v. Reinstall mounting screws in pc board panel.

w. Reinstall upper right **panel, upper rear panel, and lower rear** panel.

x. Close upper assembly.

y. Plug in power cord.

3-20.15 Replace Jam Reset Microswitch.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver

SUPPLIES: Microswitch

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Place power switch to 0 (OFF).

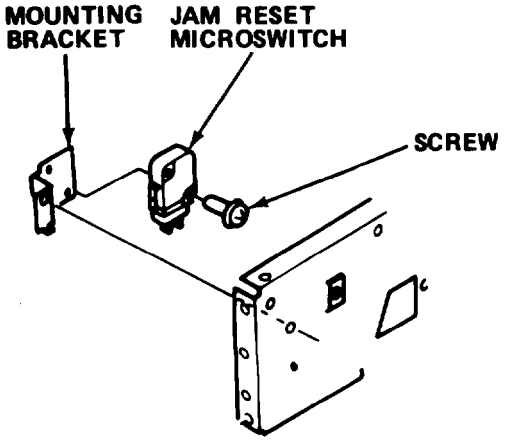
b. Unplug power cord.

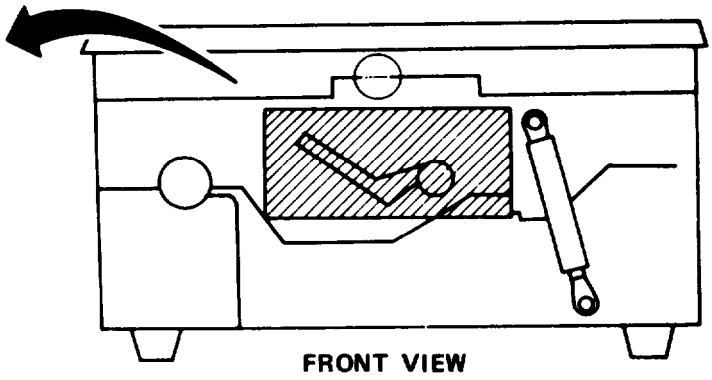
c. Open front door.

d. Remove upper left panel.

e. Remove upper and lower rear panels.

f. Remove PC board panel.





g. Unplug microswitch connector from ac driver board.

h. Remove microswitch from mounting bracket.

i. Install new microswitch on mounting bracket.

j. Connect new microswitch to ac driver board.

k. Reinstall PC board panel.

l. Reinstall upper and lower rear panels.

m. Reinstall upper left panel.

n. Close front door.

o. Plug in power cord.

3-20.16 Replace Connector PC Board.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver

SUPPLIES: Connector PC Board

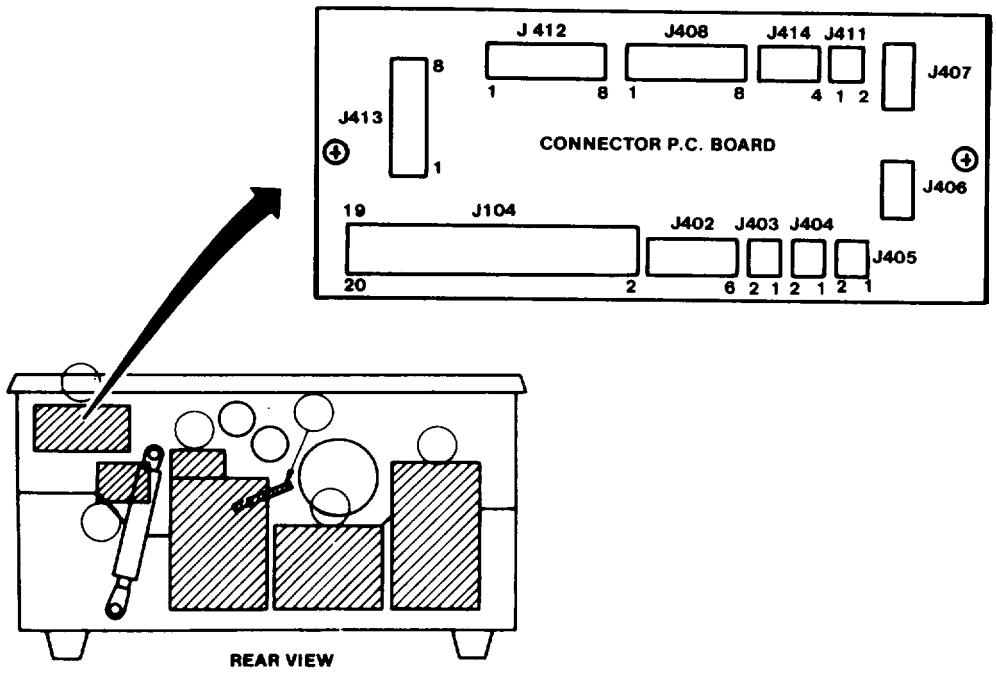
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Place power switch to O (OFF).

b. Unplug power cord.

c. Remove upper and lower rear panels.



d. Tag and disconnect all plugs on connector PC board.

e. Remove connector PC board screws.

f. Remove connector PC board.

g. Install new connector PC board and secure with screws.

h. Reconnect plugs to connector PC board and remove tags.

i. Reinstall upper and lower rear panels.

j. Plug in power cord.

k. Turn power switch to 1 (ON).

3-20.17 Adjust Stroke of Blank Exposure Shutter.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver
1/8 in. x 2-1/2 in. Flat Tip Screwdriver
1/4 in. x 4 in. Flat Tip Screwdriver
7 mm Combination Wrench
Machinist's Rule

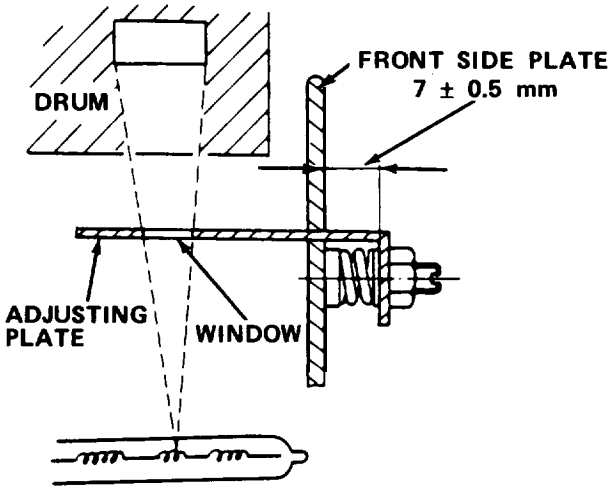
SUPPLIES: Rubber Matting

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury could result.

a. Turn power switch to O (OFF).

b. Open front door.



c. Loosen bolt and measure distance from front side plate to adjusting plate bracket.

d. Adjust bolt to obtain clearance of 7±0.5mm (0.28 in. ±0.02 in.).

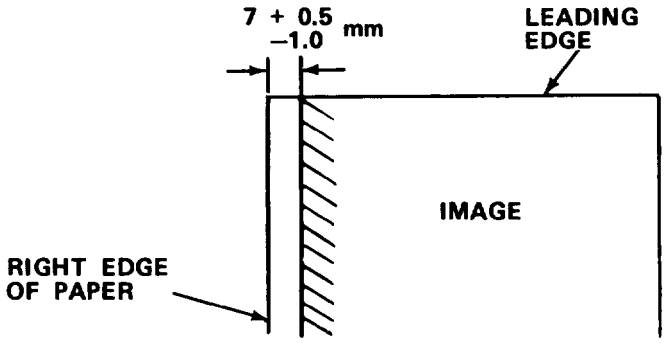
e. Close front door and turn power switch to 1 (ON).

f. Load cassette.

g* Place NA test sheet on platen.

h. When WAIT/STANDBY indicator stops flashing, make copy counter read 10.

i. Press COPY START key.



j. Measured width of clear area should be 6 to 7.5 mm (0.23 in. to 0.29 in.).

k. Readjust as necessary.

1. Turn power switch to 0 (OFF).

3-20.18 Replace Reed Switch

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver (8 in.)
Machinist's Rule
Multimeter

SUPPLIES: Reed Switch
Contact Socket
Jumper Wire

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

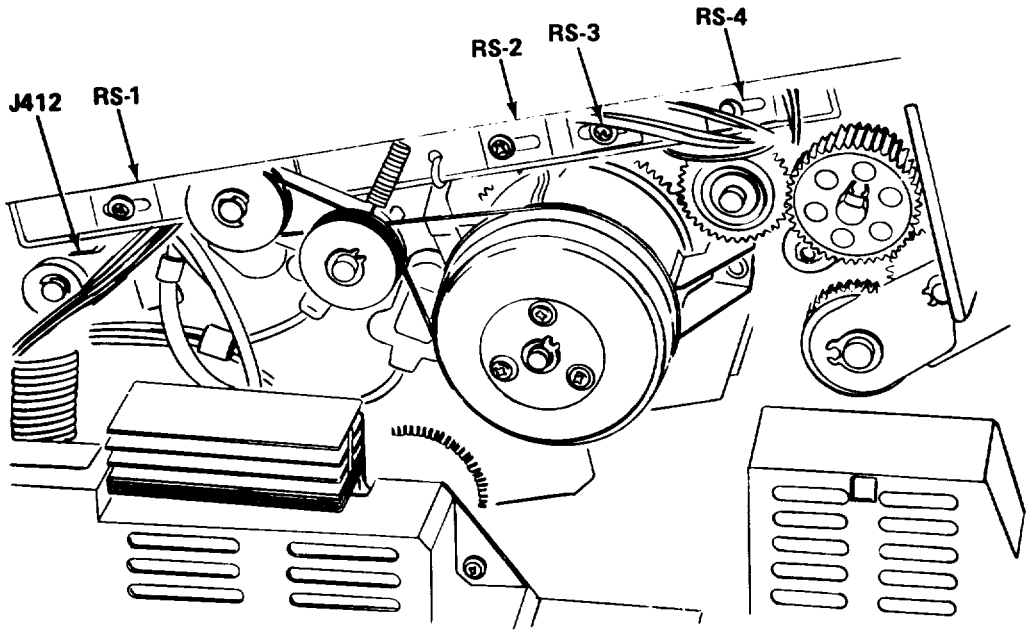
a. Turn power switch to O (OFF).

b. Unplug power cord.

c. Slide platen to right.

d. Raise upper assembly to full open position.

e. Remove upper rear panel.



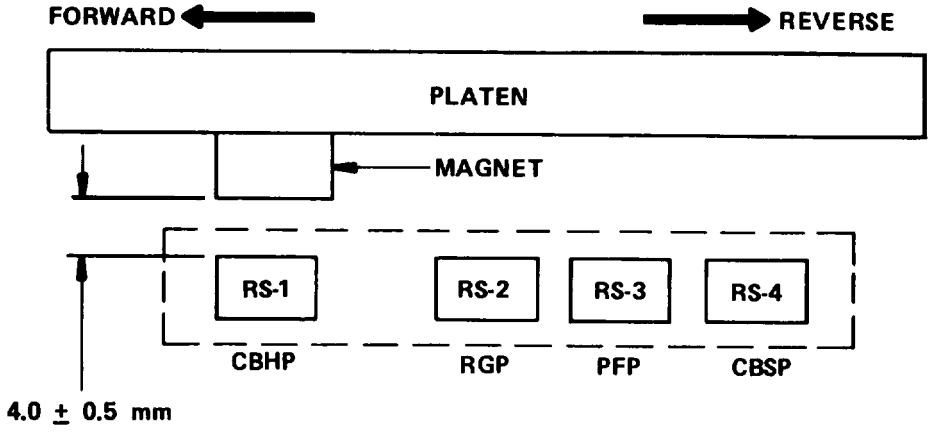
f. Disconnect reed switch(es) at connector J412.

g. Remove mounting screw for each reed switch and discard reed switch.

h. Install each reed switch so that its mounting screw is in center of slot.

i. Set multimeter to its lowest resistance scale.

j. Connect meter leads and RS1 leads to J411, pins 1 and 2.



k. Measure distance from top of RS1 to bottom of magnet. **Distance** should be 4.0±0.5tmn (0.16 in. ±0.02 in.). Adjust **as necessary.**

P.C. board	Reed switch	Check-point	Magnet	
			With	Without
Connector p.c. board	RS1 (CBHP)	J412 1 2	∞Ω (OFF)	0Ω (ON)
	RS2 (RGP)	J412 3 4	∞Ω	0Ω
	RS3 (PFP)	J412 5 6	∞Ω	0Ω
	RS4 (CBSP)	J412 7 8	∞Ω	0Ω
AC driver p.c. board	RS5 (PDPI)	J304 2 1 (− +)	0Ω (ON)	∞Ω (OFF)

l. Check that platen is to left as viewed from rear.

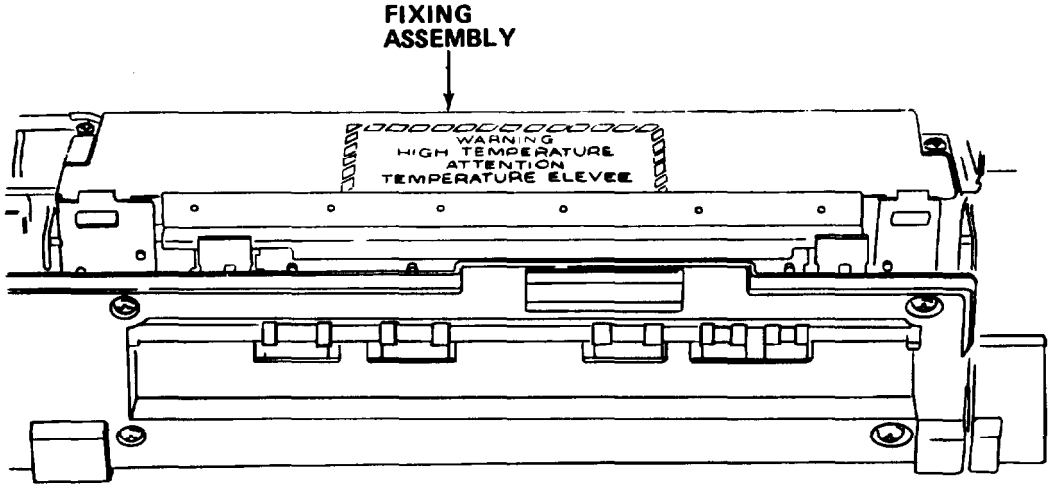
m. Multimeter should indicate 0 ohms.

n. Move platen to home position. Multimeter should indicate infinity.

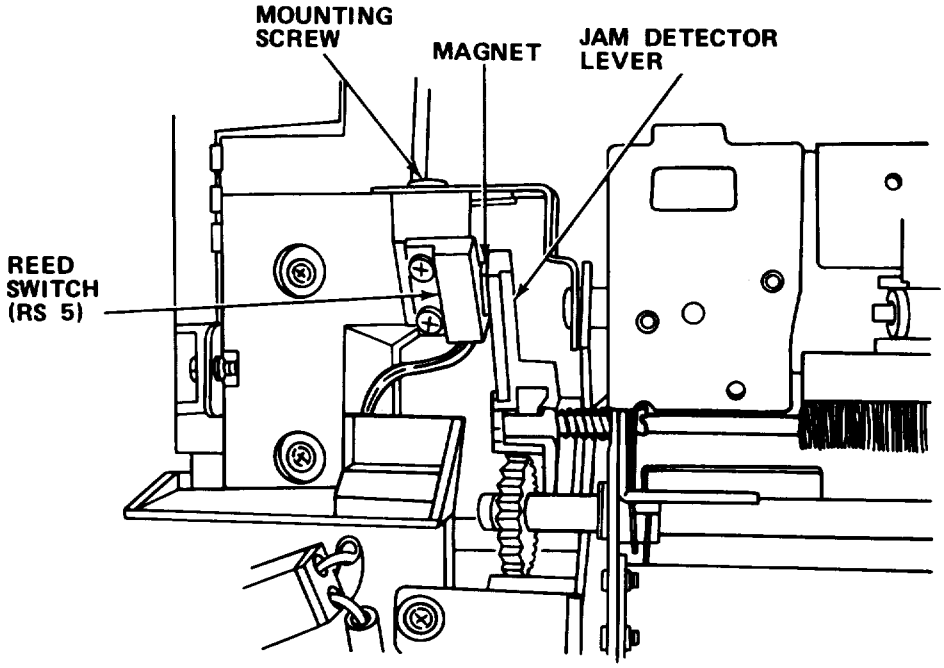
o. Remove test leads.

p* Repeat steps i thru p for RS2 thru RS4. Check points and meter indications as listed in above figure.

q. Remove lower rear panel.



r. Disconnect J6 and J304 located at rear of fixing assembly.



s. Remove reed switch RS5 mounting screw and remove reed switch.

t. Install new reed switch and secure with reed switch mounting screw.

u. Set multimeter to lowest resistance range.

v. Connect meter leads to reed switch's two pins using clips and jumper wire.

w. Move delivering assembly and jam detection lever shaft toward front of copier to eliminate end play.

x. Loosen mounting screw of reed switch mounting plate and move reed switch away from magnet. (Multimeter reading will change from 0 to infinity.)

y. Slowly move reed switch closer to magnet, and temporarily tighten mounting screw so that reed switch is 0.5 mm (0.02 in.) closer to magnet than when reading changes from infinity to O.

z. Adjust position of reed switch so that multimeter reading changes from 0 to infinity when jam detection roller is raised 2.5 mm (0.10 in.) and from infinity to O when jam detection roller is returned to original position.

aa. Tighten mounting screw,

ab. Remove multimeter leads and clips.

ac. Reconnect J6 and J304.

ad. **Reinstal 1 upper and 1 ower rear panels.**

ae. Lower and latch upper assembly.

af. Return platen to home position.

ag. Plug in power cord.

ah. Turn power switch to 1 (ON).

3-20.19 Replace High Voltage Transformer.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver

SUPPLIES: High Voltage Transformer

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

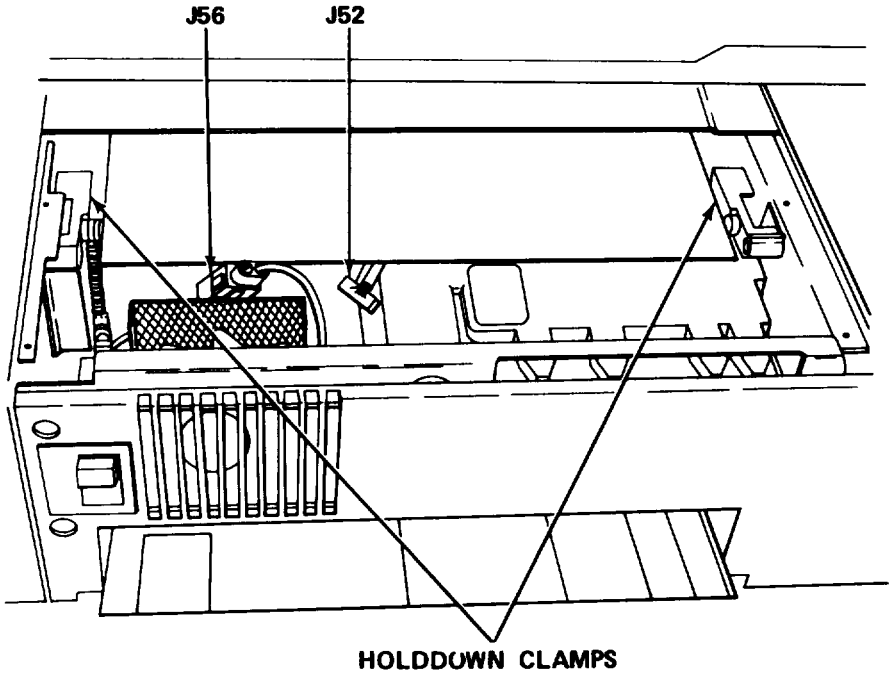
a. Turn power switch to O (OFF).

b. Unplug power cord.

c. Slide platen to the left.

d. Remove right top panel.

e. Remove upper right panel.

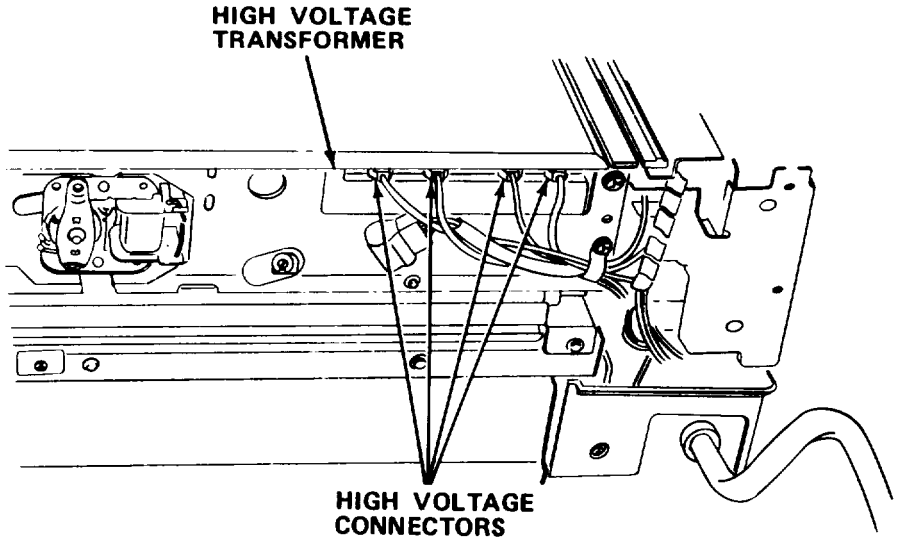


f. Unplug connectors J52 and J56.

g. Raise holddown clamps.

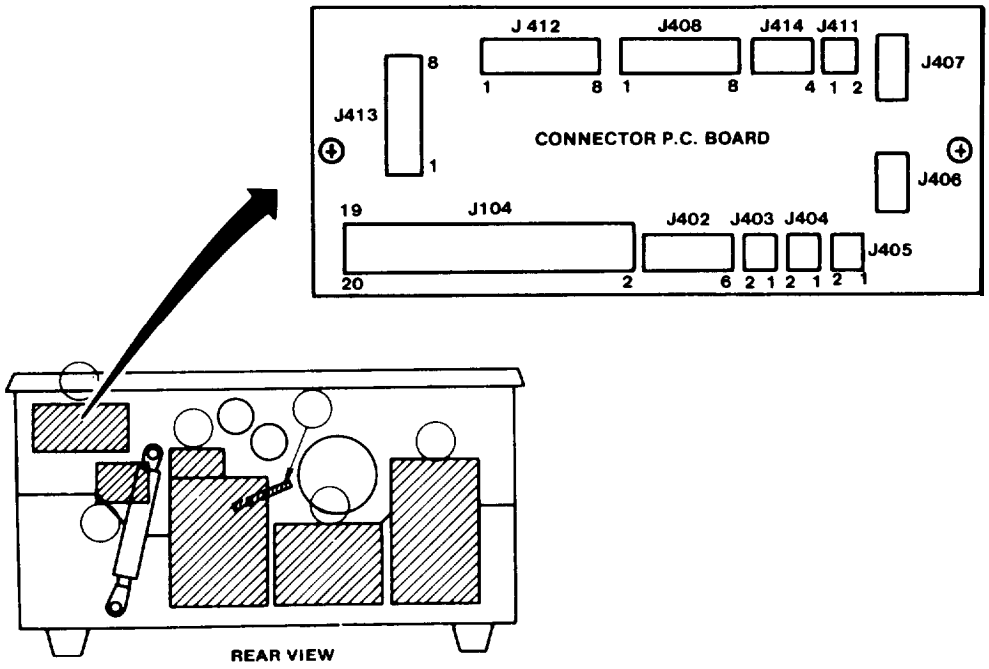
h. Slowly lift developer assembly and remove it.

i. Place assembly on flat surface covered with paper to keep foreign matter from being attracted to developing cylinder.



j. Remove high voltage connectors.

k. Remove upper rear panel.



l. Disconnect plug from J413 on connector PC board assembly.

CAUTION

With developing assembly removed, the drum surface is exposed. Use extreme care so as not to damage drum surface.

m. Remove screws holding transformer and remove transformer.

n. Install new transformer and reconnect plug J41 on PC board.

o. Reconnect high voltage connectors.

p" Reinstall developing assembly.

q. Connect connectors J52 and J56.

r. Lower holddown clamps.

s. Reinstall top right, upper rear, and upper right panels.

t. Return platen to home position.

u. Plug in power cord.

3-20.20 Replace Lamp Regul ator PC Board.

MOS: 35E, Special Electronic Devices Repairer

TOOLS : No. 2 Cross Tip Screwdriver (4 in.)

SUPPLIES: Lamp Regulator PC Board

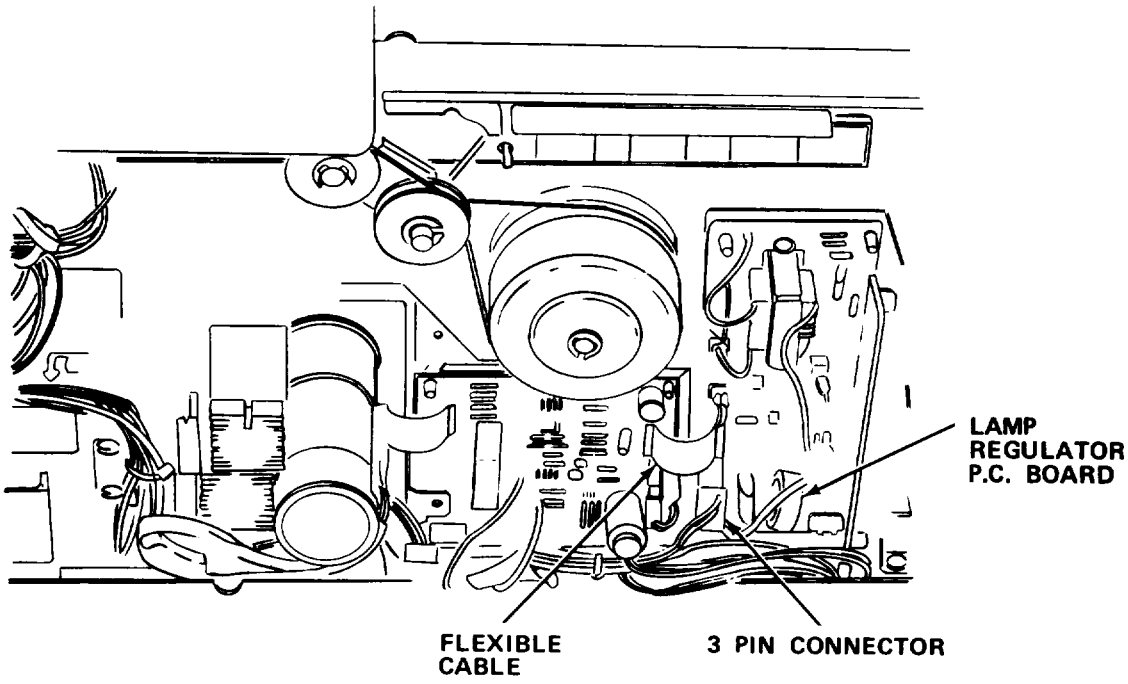
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

b. Unplug power cord.

c. Remove upper and lower rear panels and PC board panel.



d. Remove flexible cable and 3 pin connector.

e. Remove lamp regulator PC board.

f. Install new lamp regulator PC board.

g. Reinstall flexible cable and 3 pin connector.

h. Reinstall PC board panel and upper and lower rear panels.

i. Plug in power cord.

j. Turn **power switch to 1** (ON).

3-20.21 Replace Scanning Halogen Lamp.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver (3 in.)
Needle Nose Pliers

SUPPLIES: Halogen Lamp

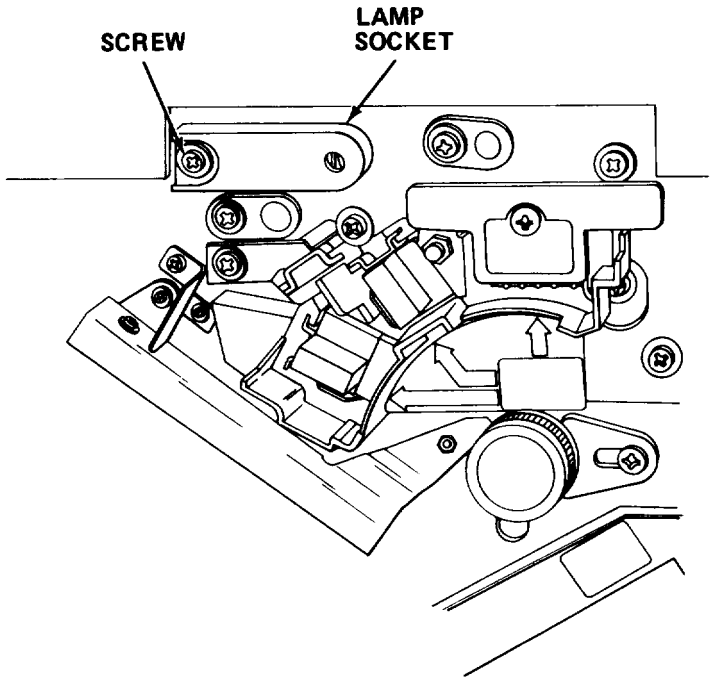
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

b. Unplug power cord.

c. Open front door.



WARNING

Do not try to pull halogen lamp out when it is hot. Serious injury could occur.

d. Remove screw holding lamp socket.

e. Remove lamp socket.

f. Pull lamp from socket and discard lamp.

CAUTION

Use clean paper to handle new halogen lamp. If lamp is contaminated by fingerprints or other marks, use dry cloth to wipe it clean. Use alcohol to remove stains. Skin oils will ruin lamp.

g. Install new lamp in socket.

h. Reinstall socket and tighten screw holding socket.

i. Close front door.

j. Plug in power cord.

k. Turn power switch to 1 (ON).

3-20.22 Replace Ozone Filter.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver (3 in.)

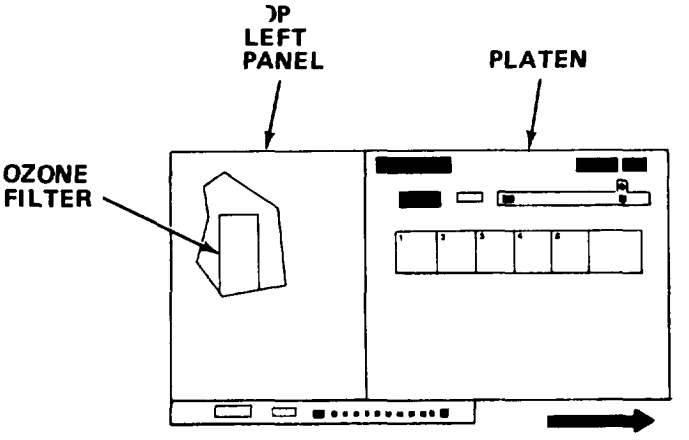
SUPPLIES: Ozone Filter

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

b. Unplug power cord.



c. Slide platen to right and remove top left panel.

d. Remove ozone filter.

e. Install new ozone filter.

f. Reinstall top left panel.

g. Return platen to home position.

h. Plug in power cord.

i. Turn power switch to 1 (ON).

3-20.23 Replace Developing Assembly Bulb.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver (4 in.)

SUPPLIES: Copy Paper
Bulb
Single-Component Developer

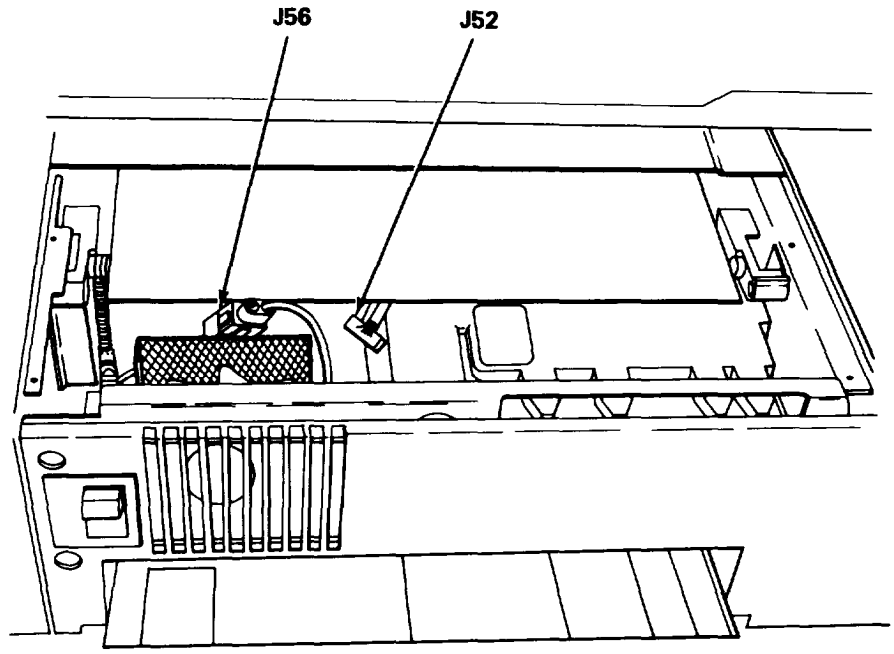
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

b. Unplug power cord.

c. Slide platen to left.



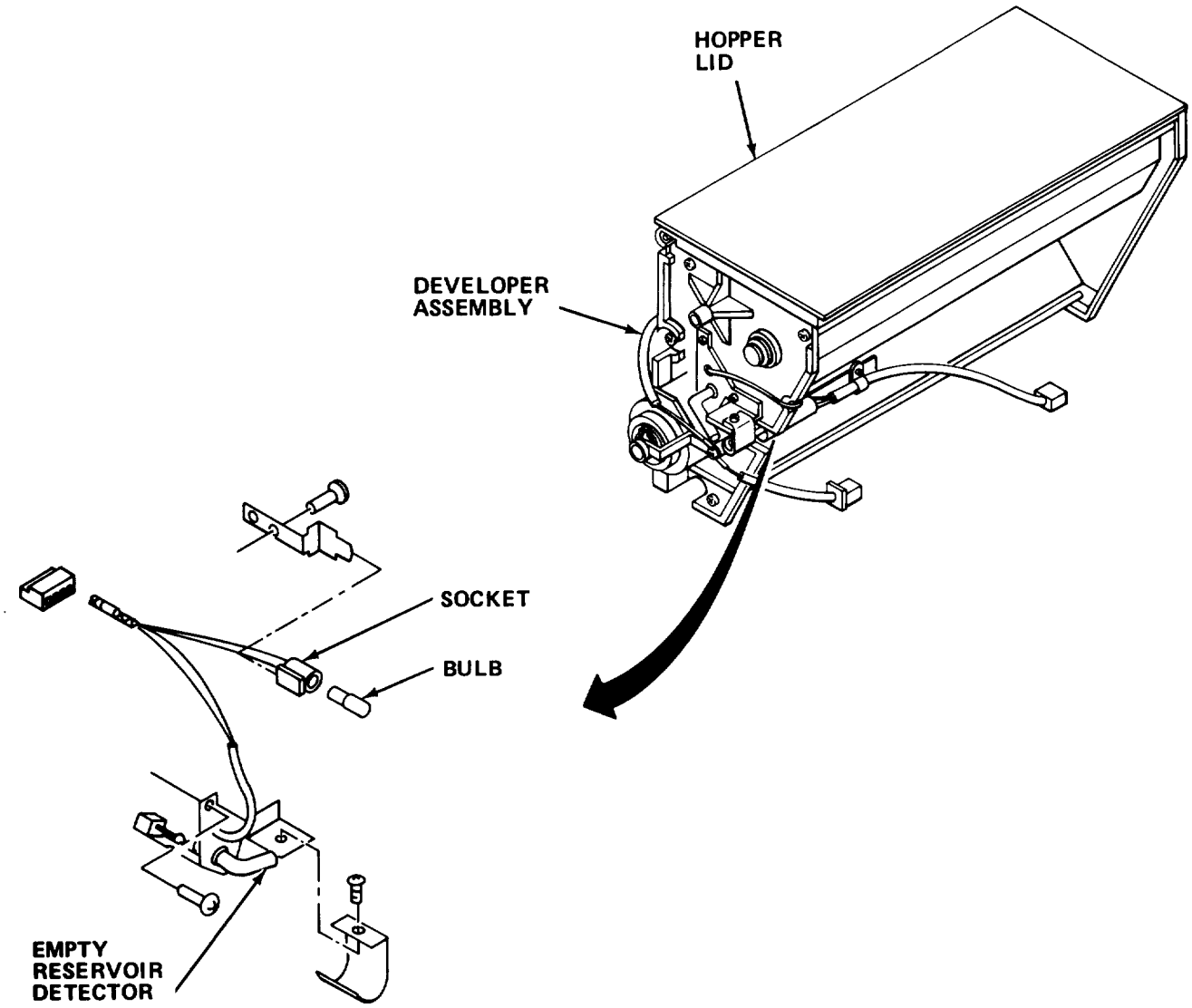
d. Remove top right cover.

e. Raise holddown clamps.

f. Unplug connectors.

g. Slowly lift developing assembly and remove it.

h. Place assembly on desk covered with paper to keep foreign matter from being attracted to developing cylinder.



i. Remove developing assembly bulb.

j. Install new developing assembly bulb.

NOTE

- Portion of side plate at front of developing assembly should be engaged in groove in part of developing assembly support.

. Prevent hopper lid from touching platen.

k. Slowly lower developing assembly onto its support while pushing rear side plate.

l. Reconnect plugs.

m. Reinstall top right panel.

n. Return platen to home position.

o. Plug in power cord.

p. Turn power switch to 1 (ON).

3-20.24 Repl ace Developing Assembly Detector.

MOS : 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver (4 in.)

SUPPLIES: Copy Paper
Empty Reservoir Detector
Single-Component Developer

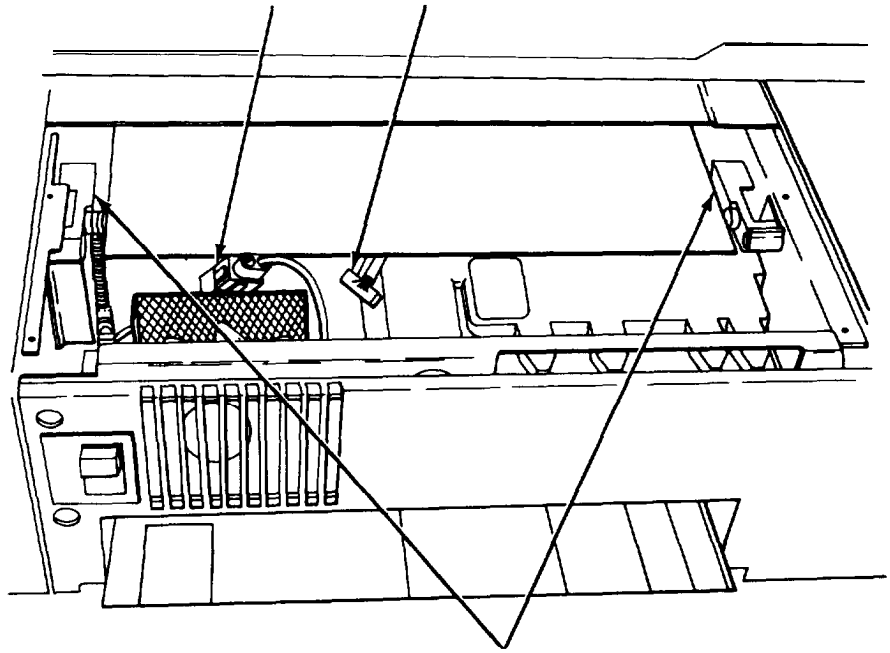
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

b. Unplug power cord.

c. Slide platen to left.



HOLDDOWN CLAMPS

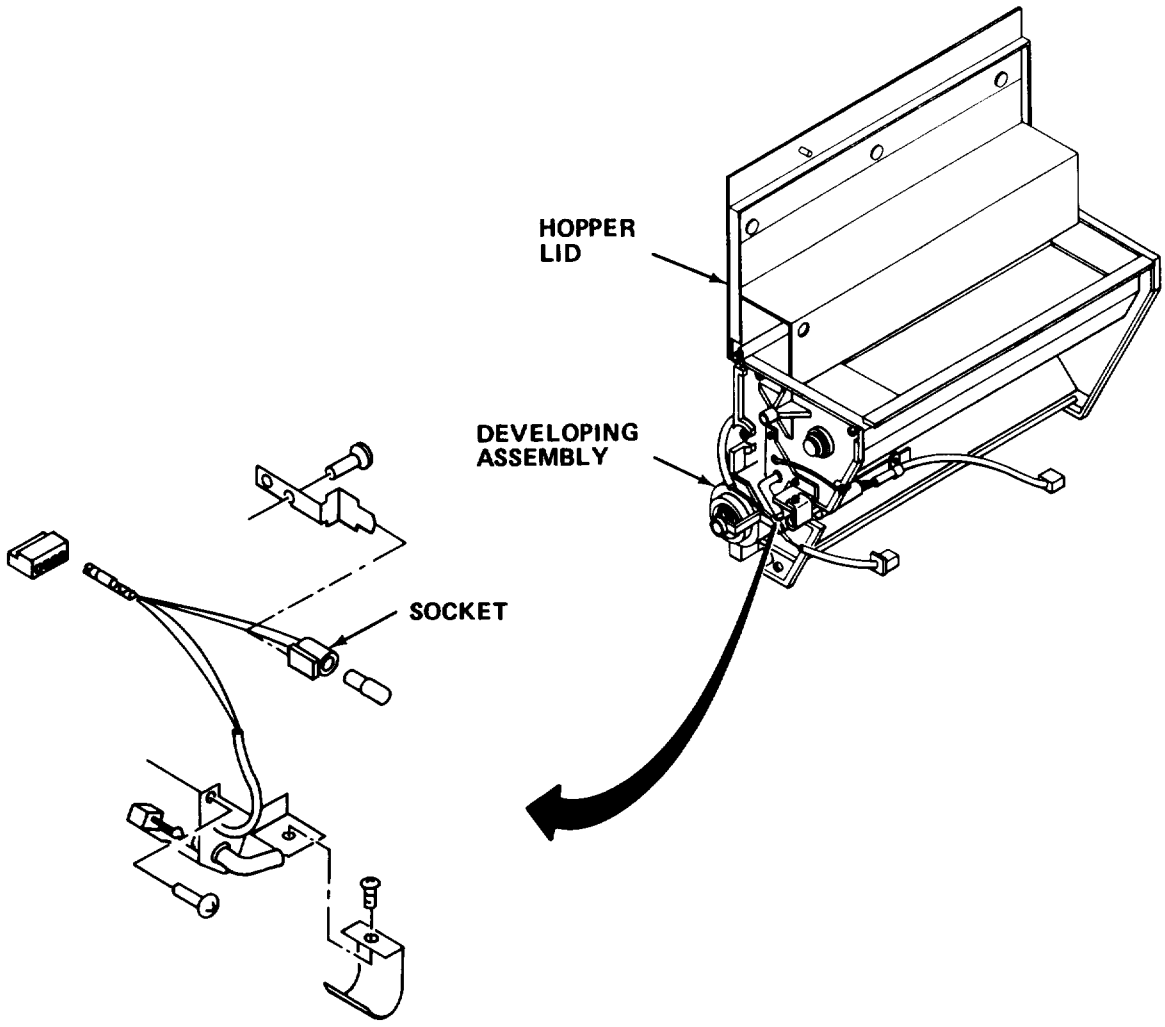
d. Remove top right panel.

e. **Raise holddown clamps.**

f. Unplug connectors.

g. Slowly lift developing assembly up and remove it.

h. Place assembly on desk covered by paper to keep foreign matter from being attracted to developing cylinder.



i. Turn developing assembly over and empty contents of hopper into plastic bag and discard.

j. Remove sensor assembly and remove empty reservoir detector.

k. Install new empty reservoir detector and reinstall sensor assembly.

NOTE

Prevent hopper lid from touching platen. Do not push assembly to front.

1. Slowly lower developing assembly onto its support while pushing rear side plate.

m. Reconnect connectors.

n. Reinstall top right panel.

o. Refill hopper with new developer in accordance with operating instructions (paragraph 3-6.2.1).

p" Return platen to home position.

q. **Plug in power cord.**

r. Turn power switch to 1 (ON).

3-20.25 Replace Keypad.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver (6 in.)
Grip Ring Pliers

SUPPLIES: Keypad

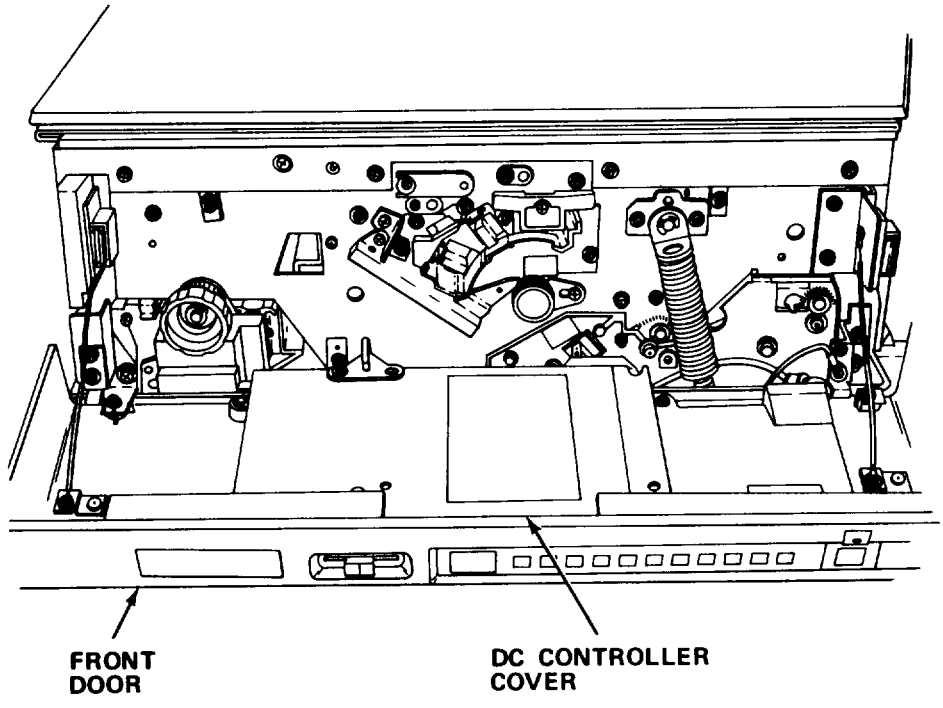
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

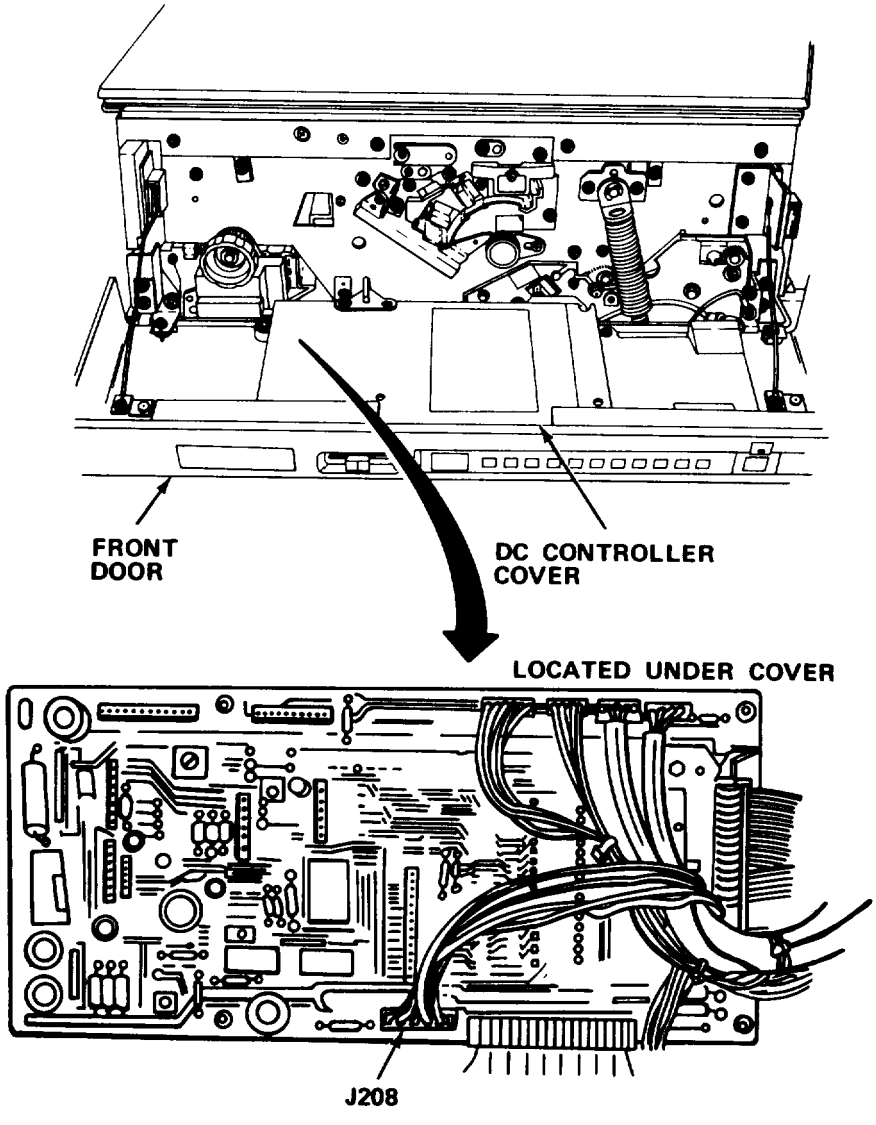
b. Unplug power cord.

c. Remove knob from exposure control lever.



d. Open front door.

e. Remove dc controller cover.



f. **Unplug connector J208 on dc controller board.**

g. **Remove grip rings from display PC board.**

h. Remove fastening screws and keypad.

i. Install new keypad and fastening screws.

j. Reinstall grip rings on controller board.

k. Reconnect connector J208 on dc controller board.

1. Reinstall dc controller cover.

m. Close front door.

n. Reinstall knob on exposure control lever.

o. Plug in power cord.

p. Turn power switch to 1 (ON).

3-20.26 Replace Display PC Board

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver (6 in.)
Grip Ring Pliers

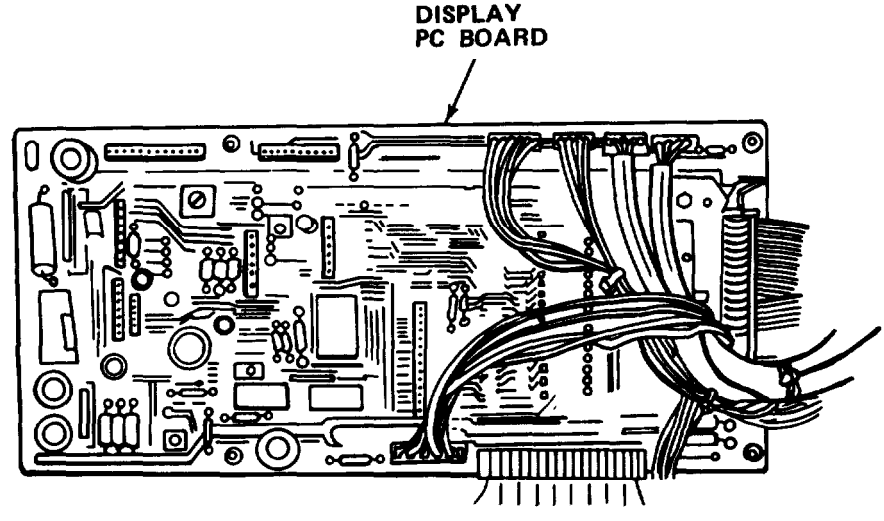
SUPPLIES: Display PC Board

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

b. Unplug power cord.



c. Open front door.

d. Remove dc controller cover.

e. Remove grip rings holding display PC board.

f. Remove ground wire terminal.

g. Remove display PC board.

h. Install new display PC board.

i. Attach ground wire terminal.

j. Reinstall grip rings.

k. Reinstall dc controller cover.

m. Close front door.

n. Plug in power cord.

o. Turn power switch to 1 (ON).

3-20.27 Replace Counter,

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Cross Tip Screwdriver (3 in.)
Offset Cross Tip Screwdriver
Diagonal Cutters

SUPPLIES: Counter
Hire Nuts

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

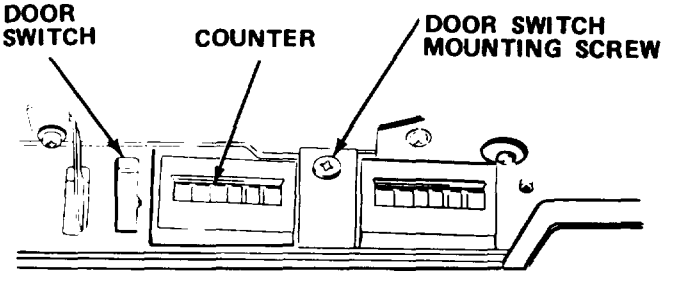
b. Unplug power cord.

c. Slide platen to right.

d. Raise upper assembly to full open position.

e. Remove lower front panel.

f. Remove door switch cover.



g. Remove counter and door switch assembly mounting screws.

h. Remove counter mounting screws.

i. Tag and disconnect counter electrical wiring and remove counter.

j. Install new counter, attach mounting screws, and connect electrical wiring.

k. Install counter and door switch assembly mounting screws.

1. Reinstall door switch cover.

m. Reinstall lower front panel.

n. Lower and latch upper assembly.

o. Plug in power cord.

p. Turn power switch to 1 (ON).

3-20.28 Clean Developing Assembly Guide Roller, Spacer Roller, and Empty Reservoir Detector.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver

SUPPLIES: Lens Cleaning Tissue (Item 30, Appendix E)

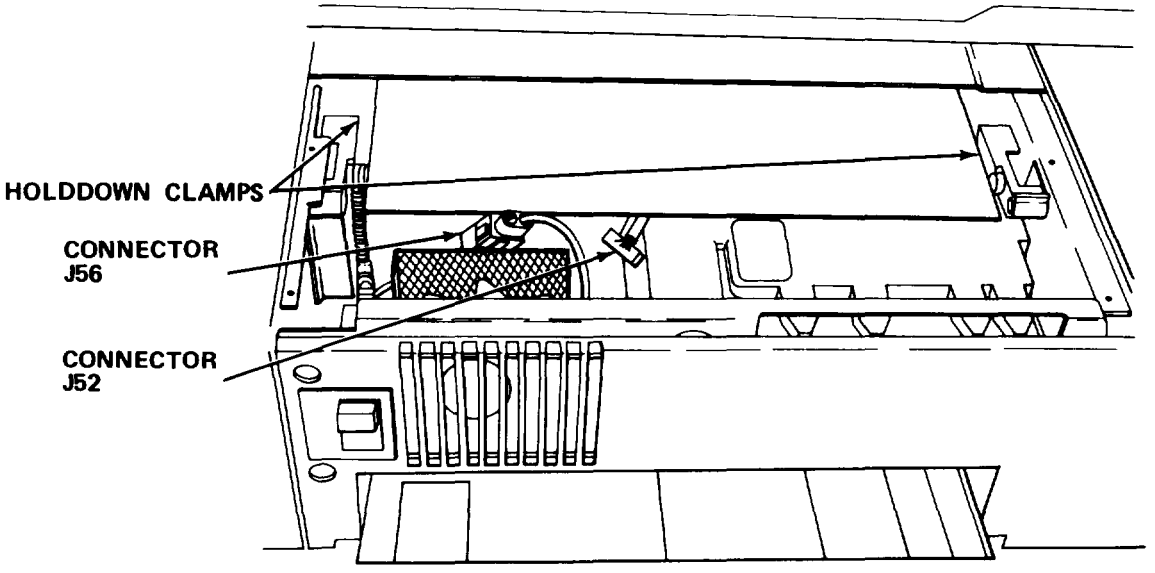
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

b. Unplug power cord.

c. Slide platen to left.



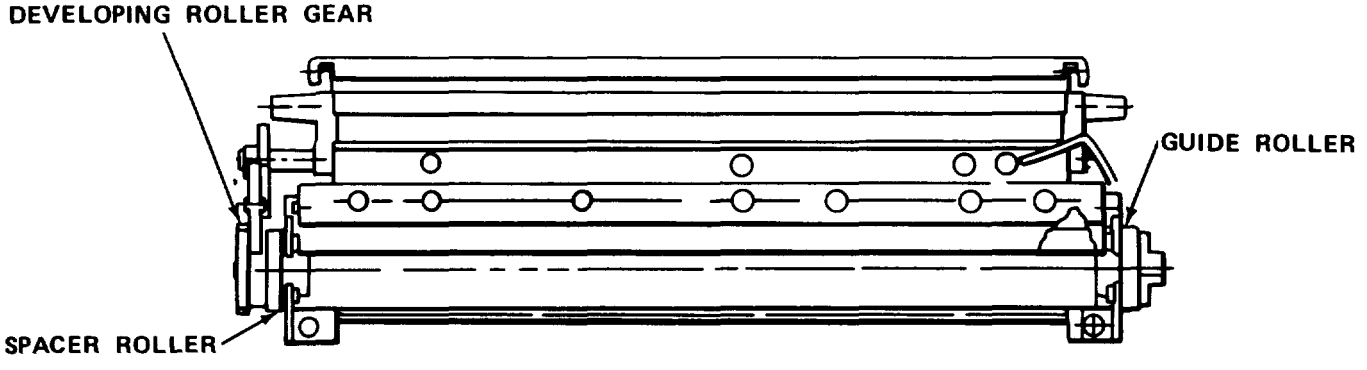
d. Remove top right panel.

e. Raise holddown clamps.

f. Unplug connectors.

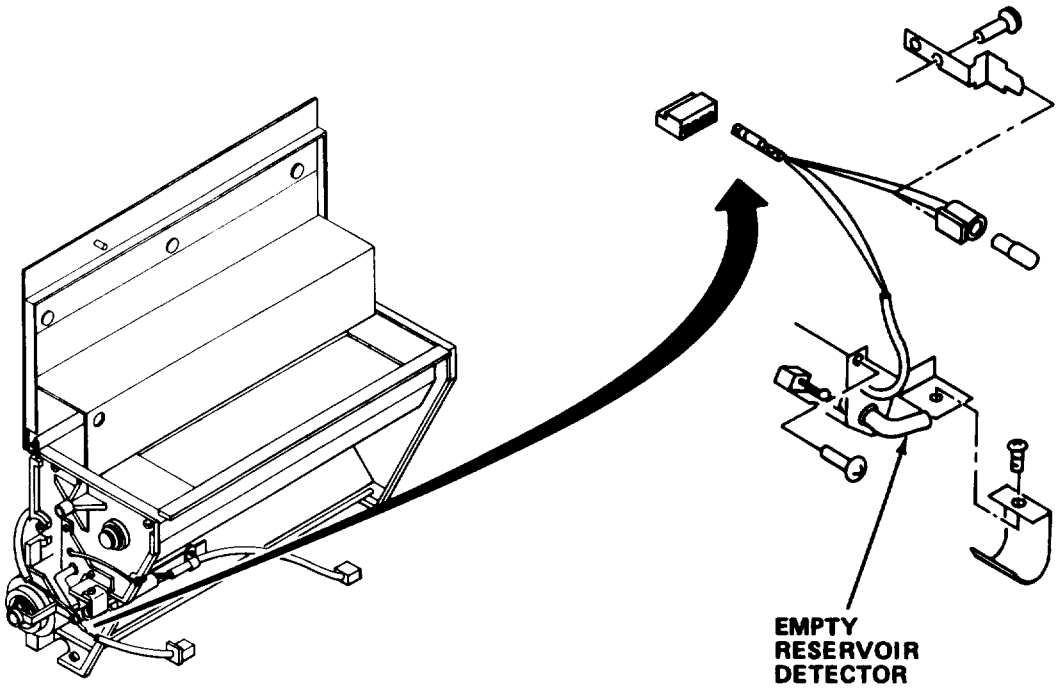
g. Slowly lift developer assembly up and remove it.

h. Place assembly on desk covered with paper to keep foreign matter from being attracted to developing cylinder.



i. Use lens cleaning tissue to clean guide roller.

j. Use lens cleaning tissue to clean developing roller gear and spacer roller.



k. Using a clean moist cloth, remove residue from empty reservoir detector.

NOTE

. Portion of side plate at front of developing assembly should be engaged in groove in part of developing assembly support.

● Prevent hopper lid from touching platen.

1. Slowly lower developing assembly onto its support while pushing toward rear side plate.

m. Reconnect connectors.

n. Reinstall top right panel.

0. Return platen to home position.

p* Plug in **power cord.**

q. Turn power switch to 1 (ON).

3-20.29 Adjust Clearance Between Developing Cylinder and Blade.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Machinist's Rule
Feeler Gage (0.2mm and 0.04 mm thickness)
No. 2 Cross Tip Screwdriver

SUPPLIES: Copy Paper
Single-Component Developer
Lens Cleaning Tissue (Item 30, Appendix E)

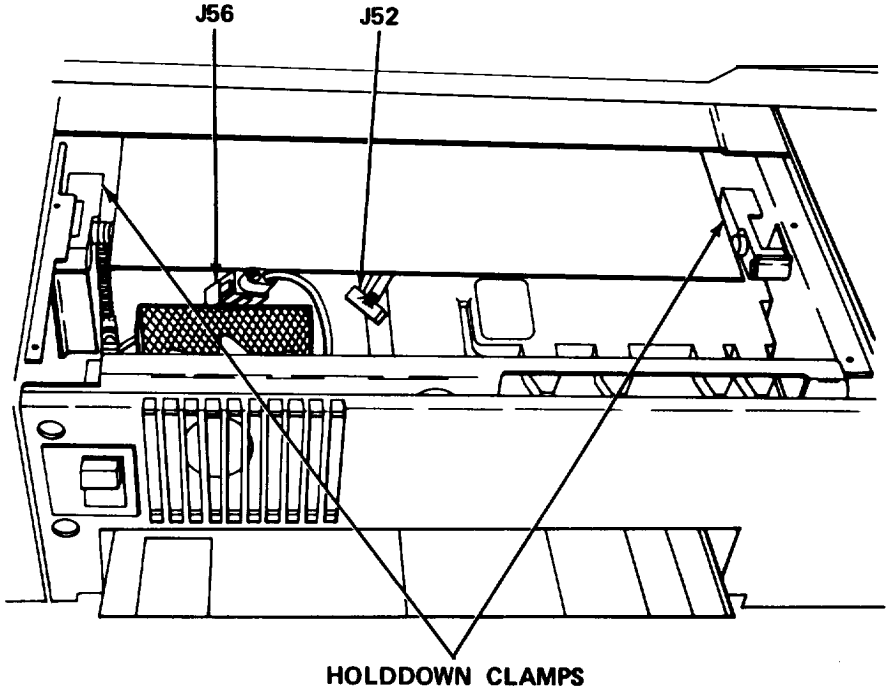
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Place power switch to O (OFF).

b. Unplug power cord.

c. Slide platen to right.



d. Remove top right panel.

e. Raise holddown clamps.

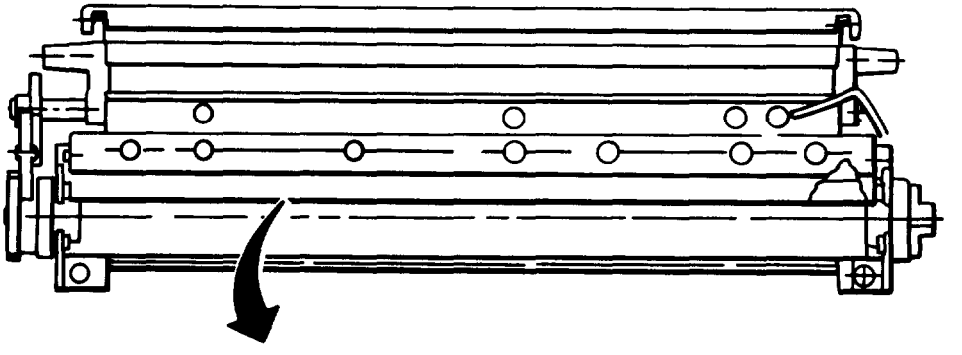
f. Unplug connectors.

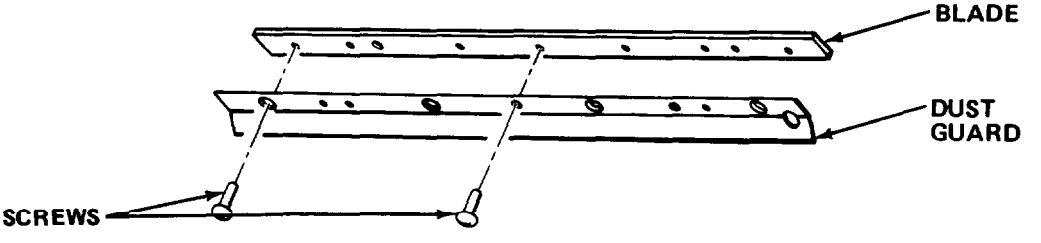
g" slowly lift developing assembly up and remove it.

h. Place assembly on desk covered with paper to keep foreign matter from being attracted to developing cylinder.

i. Open hopper lid and remove interior lid.

j. Turn developing assembly over and empty contents of hopper into plastic bag and discard.





k. Remove screws.

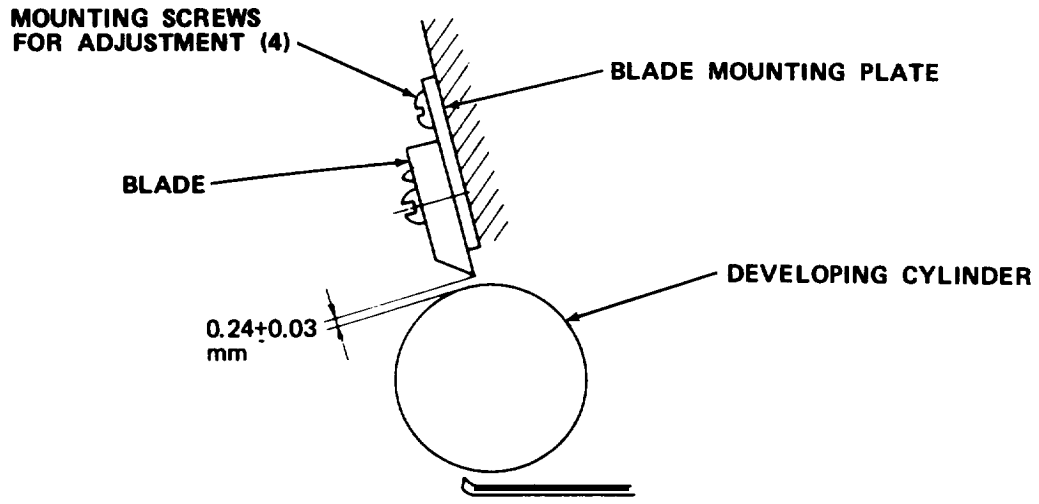
1. Remove dust guard and blade.

m. Use lens **cleaning tissue** to remove all residue from developing cylinder and blade.

n. Reinstall blade. Tighten screws.

CAUTION

Remove oil from feeler gages to avoid contaminating developing cylinder.



o. Loosen mounting screws on blade mounting plate.

p. Put the 0.2 mm and 0.04 mm gages together to make a 0.24 mm gage.

q. Insert the feeler gage between the blade and cylinder on one side, and snug up that mounting screw while holding the blade against the gage.

r. Repeat for the other side and snug up that mounting screw.

s. Recheck clearance and readjust as necessary.

t. Reinstall dust guard and tighten all screws.

NOTE

Portion of side plate at front of developing assembly should be engaged in groove in part of developing assembly support.

u. Slowly lower developing assembly onto its support while pushing rear side plate.

v* Reconnect connectors.

w. Reinstall top right panel.

x. Refill hopper with new developer in accordance with operating instructions (paragraph 3-6.2. 1).

y. Return platen to home position.

z. Plug in power cord.

3-20.30 Replace Developing Assembly Seals and Blade Scraper.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Cross Tip Screwdriver
Flat Tip Screwdriver
Grip Ring Pliers

SUPPLIES: Front Seal
Rear Seal
Single-Component Developer
Blade Scraper

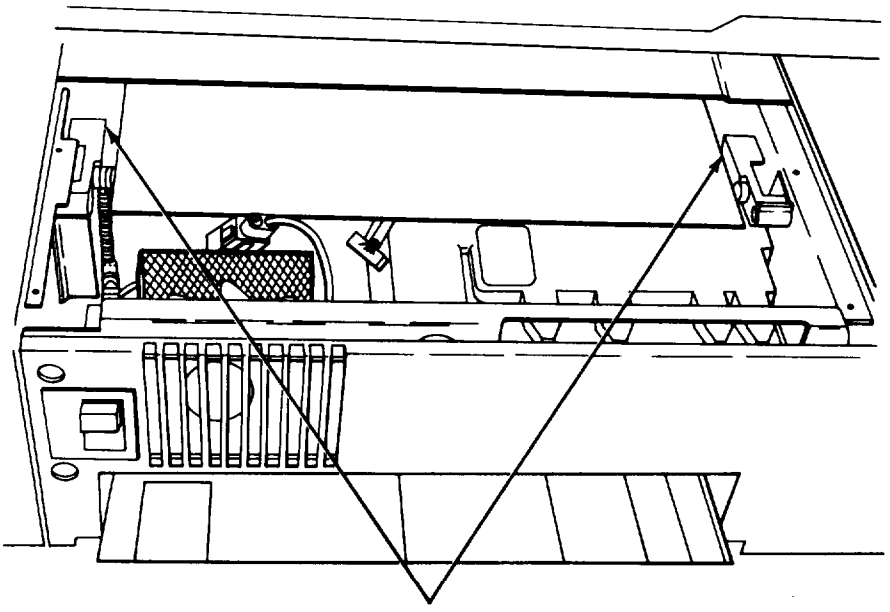
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Place power switch to O (OFF).

b. Unplug power cord.

c. Slide platen to left.



HOLDDOWN CLAMPS

d. Remove top right panel.

e. Raise holddown clamps.

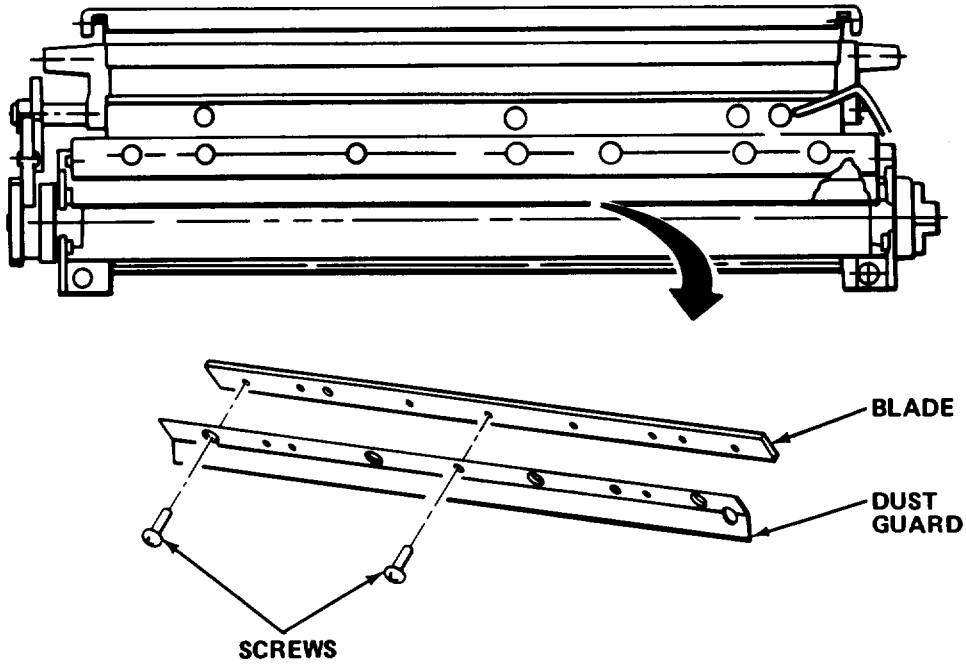
f. Unplug connectors.

9“ Slowly lift developer assembly up and remove it.

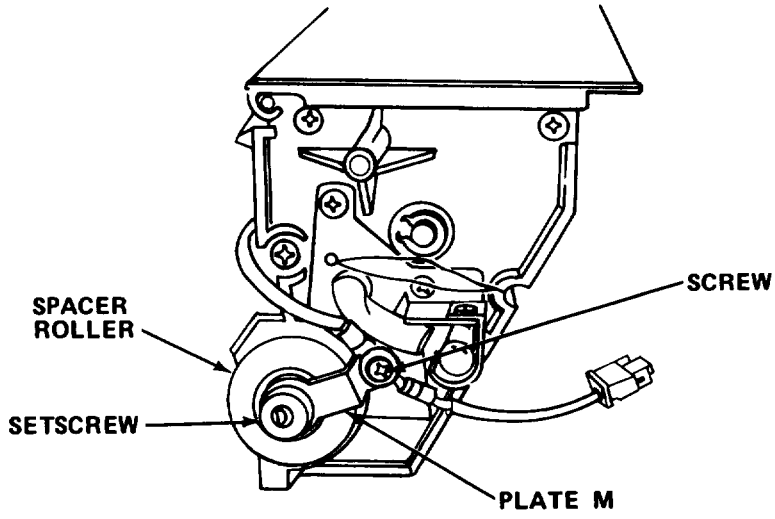
h. Place assembly on desk covered with paper to keep foreign matter from being attracted to developing cylinder.

i. Open hopper lid and remove interior lid.

j. Turn developing assembly over and empty contents of hopper into plastic bag and discard.

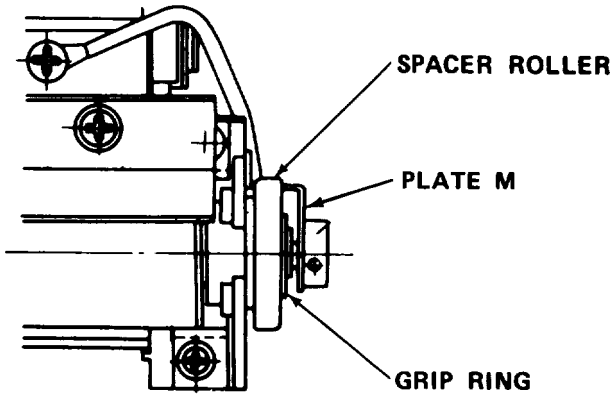


k. Remove screws, dust guard, and blade.

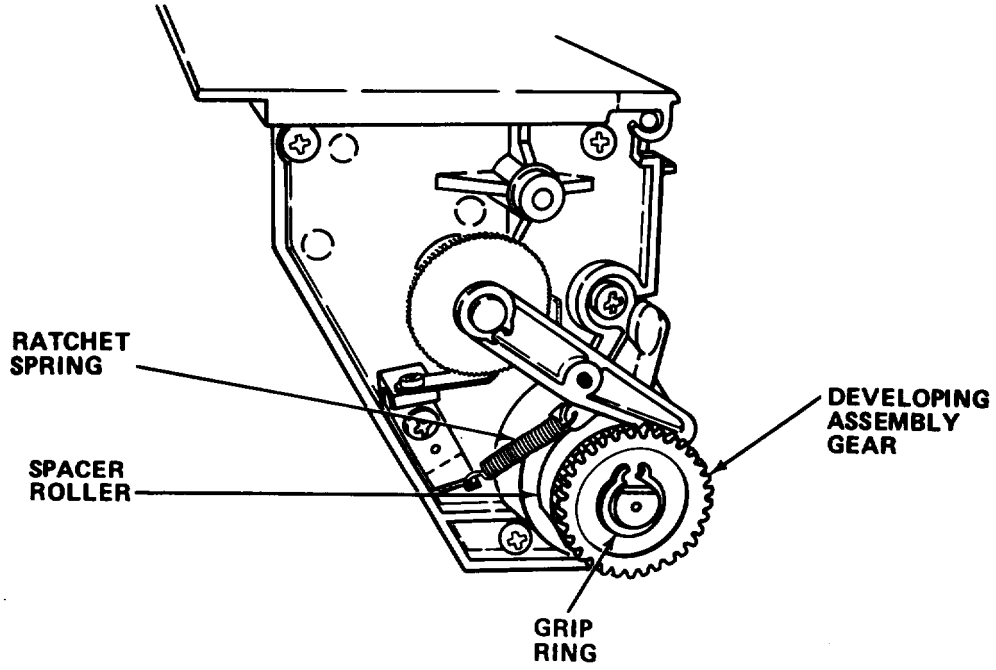


1. **Loosen setscrew; then** remove securing screw for bias cable terminals.

m. Remove plate M.



n. Remove grip ring and spacer roller.



o. Remove grip ring and remove developing assembly gear.

p. Remove ratchet spring and remove spacer roller.

NOTE

Matchmark bearings and housing prior to removal.

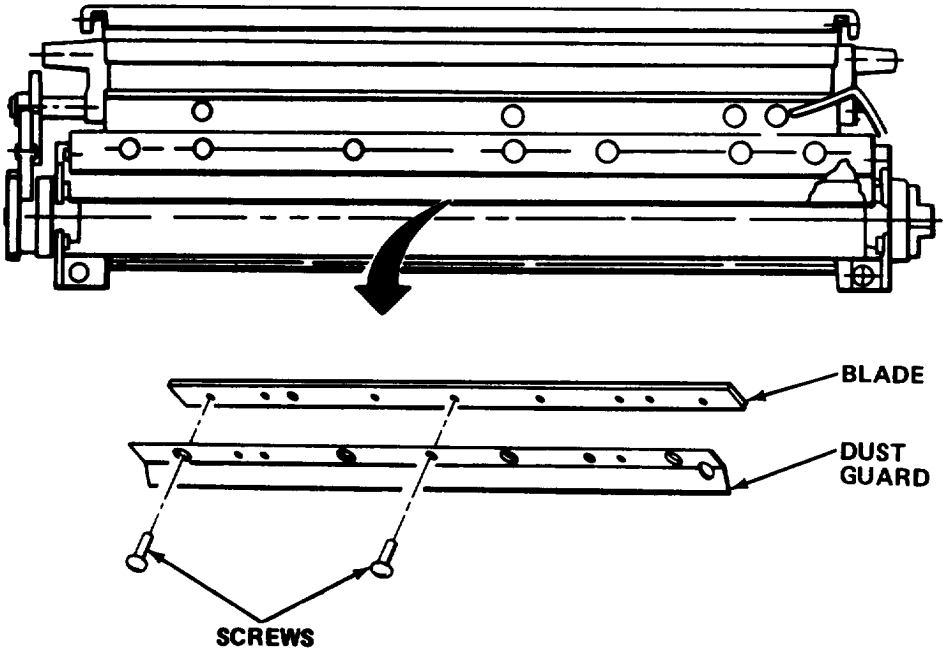
q. Remove bearings from each end of shaft.

CAUTION

Keep developing cylinder clear of fingerprints and oil to prevent contamination.

r. Remove developing cylinder.

s. Remove the bulb mounting bracket.



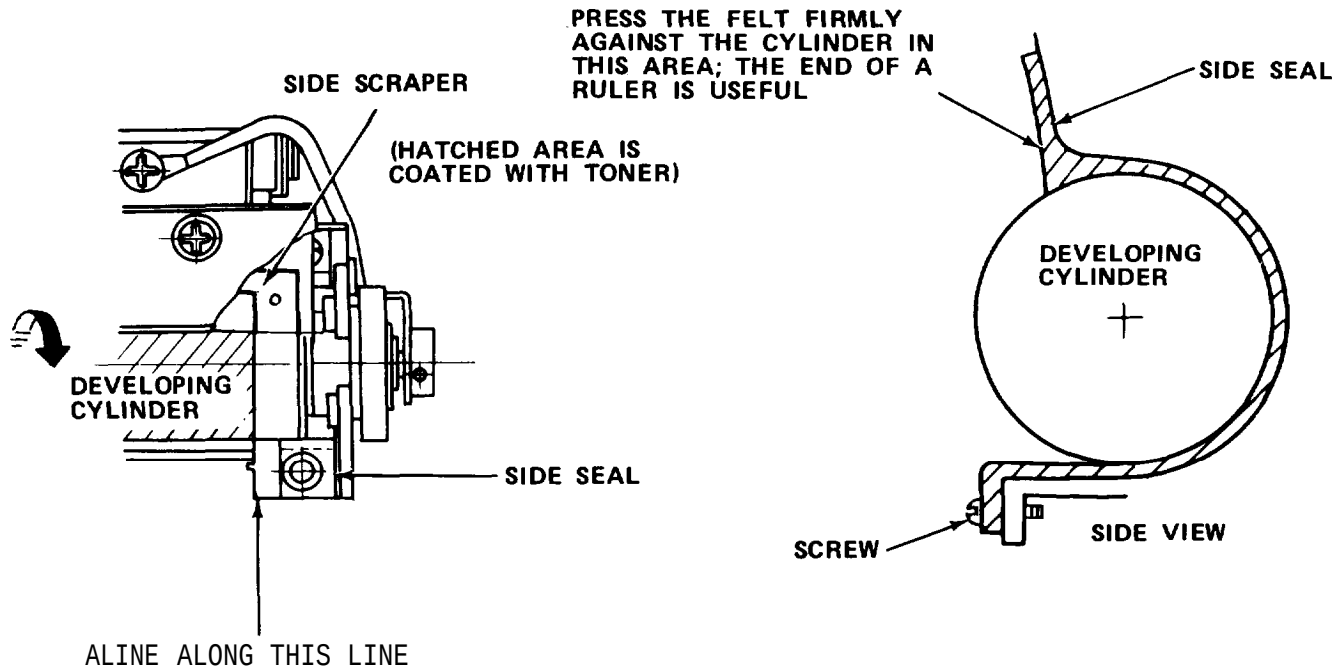
t. Remove screws holding scraper blade in place and remove scraper blade and holddown plate.

NOTE

Upper edges of the holes in scraper blade must be lined up with the bottom edge of the scraper holddown plate.

u. Install new scraper blade.

v. Reinstall bulb mounting bracket.

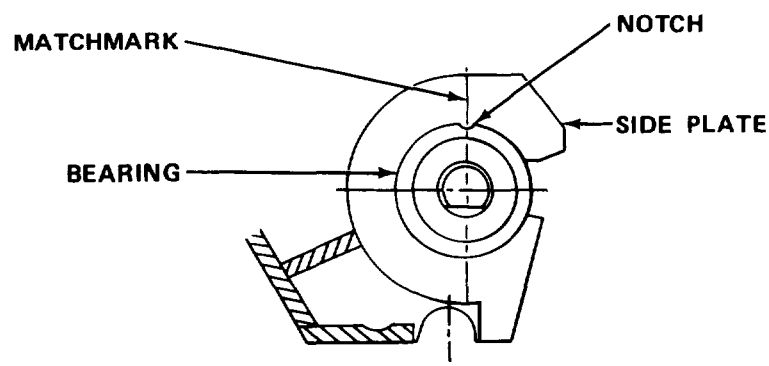


w. Remove screws and peel off defective seals. Clean off old adhesive.

x. Install the new seals so that their inner edges are at the same position as the edge of developer layer on the developing cylinder. Reinstall screws but do not tighten.

y. Clean and install developing cylinder.

z. Press firmly against seal while tightening mounting screw.

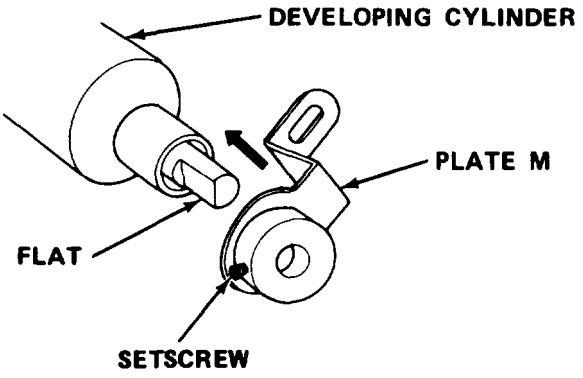


aa. Reinstall the bearings by lining up previous matchmarks.

ab. Reinstall rear spacer roller and gear with grip ring.

ac. Reinstall ratchet spring.

ad. Reinstall front spacer roller and secure with grip ring.



ae. Rotate developing cylinder shaft so that flat on the shaft is alined with the position of the setscrew on plate M. Install plate M and tighten setscrew.

af. Reinstall securing screw and bias cable.

ag. Reinstall blade and dust guard and secure with screws.

ah. Reinstall interior lid and hopper.

NOTE

- Portion of side plate at front of developing assembly should be engaged in groove in part of developing assembly support.
- Prevent hopper lid from touching platen.

ai. Refill hopper with two bags of new developer. Turn drive gear manually to the right to coat cylinder with new developer.

aj. Slowly lower developing assembly onto its support while pushing toward rear side plate.

ak. Reconnect plugs.

al. Lower holddown clamps.

am. Reinstall top right panel.

an. Return platen to home position.

ao. Plug in power cord.

3-20.31 Adjust Leading Edge Blank Space and Paper Loop.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver
Machinist's Rule

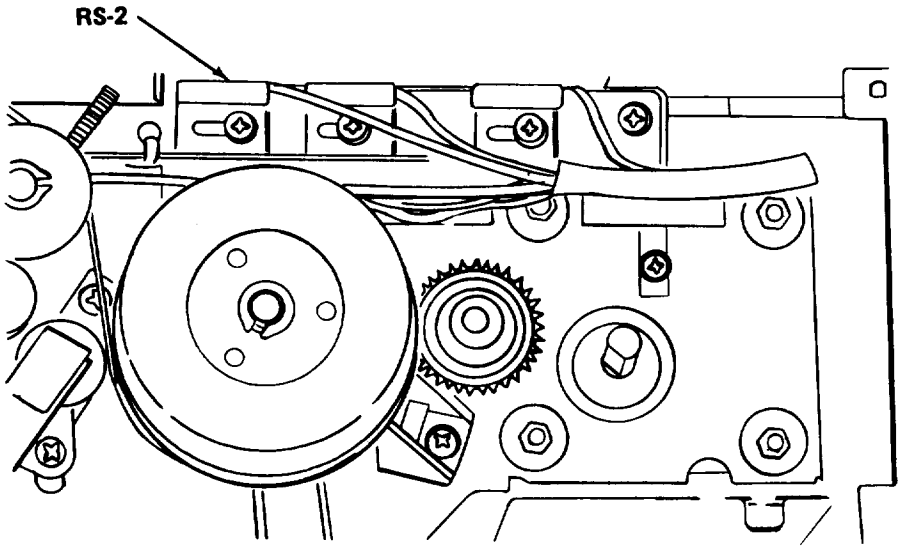
SUPPLIES: NA Test Sheet
Rubber Hatting
Jumper Wire

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury could result.

a. Turn power switch to 0 (OFF).

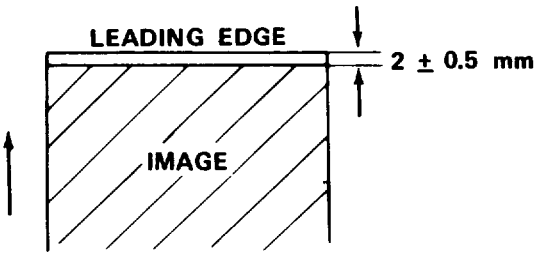
b. Remove upper rear panel of copier.



c. Loosen, but do not remove screw holding RS2 in place.

d. Place NA test sheet on platen.

e. Turn power switch to 1 (ON).



NOTE

Moving reed switch to right (as viewed from rear) increases leading edge blank space and moving to left decreases it.

f. Adjust position of reed switch so that width of leading edge blank space is 2 ± 0.5 mm (0.08 ± 0.02 in.) when copying test sheet, and tighten screw.

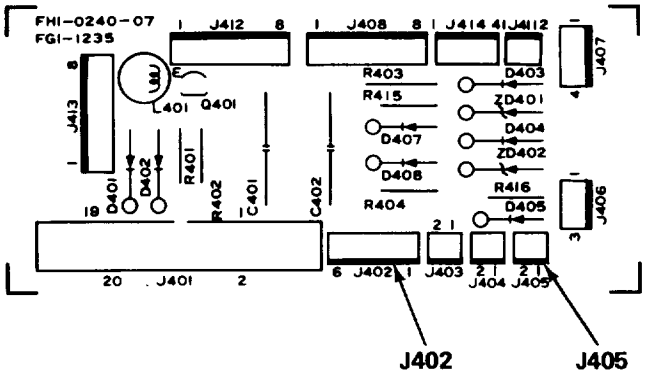
NOTE

Leading edge blank space may vary slightly when rear panel is mounted because of the magnetic field of the magnet that operates the reed switch.

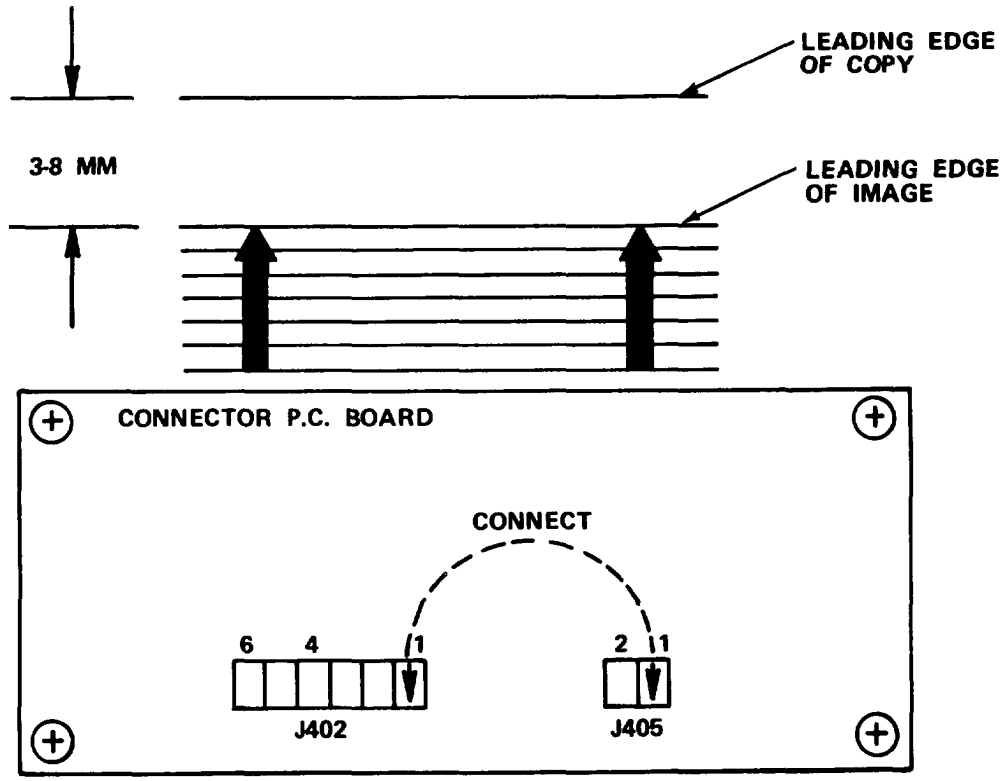
g. Reinstall upper rear panel.

h. Make 10 test copies and average measurements.

i. Turn power switch to O (OFF).



j. Remove upper rear panel, and locate J402 and J405.



k. Remove connectors; then connect jumper wire from J402-1 to J405-1.

l. Insert loaded cassette into copier.

m. Turn power switch to 1 (ON).

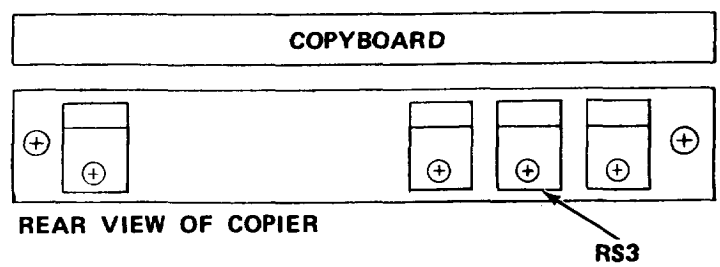
n. On keypad, select 10. Copy number display should read 10.

o. When WAIT/STANDBY indicator stops flashing, press COPY START key.

p. Measure leading edge of each copy and determine average.

NOTE

If average is between 3 and 8 mm (0.12 and 0.31 in.), no further action is required. If average is greater or less than specifications, proceed to step q.



NOTE

To increase leading edge, move RS3 to right as viewed from rear of copier. To decrease leading edge, move RS3 to left.

q. Loosen reed switch RS3 mounting screw. Adjust position of RS3 so that the leading edge of the image is 3 - 8 mm (0.12 in. to 0.31 in.) from leading edge of copy. Tighten screw.

r. Repeat steps n thru p until proper adjustment is obtained.

s. Turn power switch to O (OFF).

t. Remove jumper wire from J402-1 and J405-1 and reconnect connectors.

u. Reinstall upper rear panel and remove NA test sheet from platen.

3-20.32 Adjust Platen Drive Wire.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver
Spring Hook

SUPPLIES: Spring

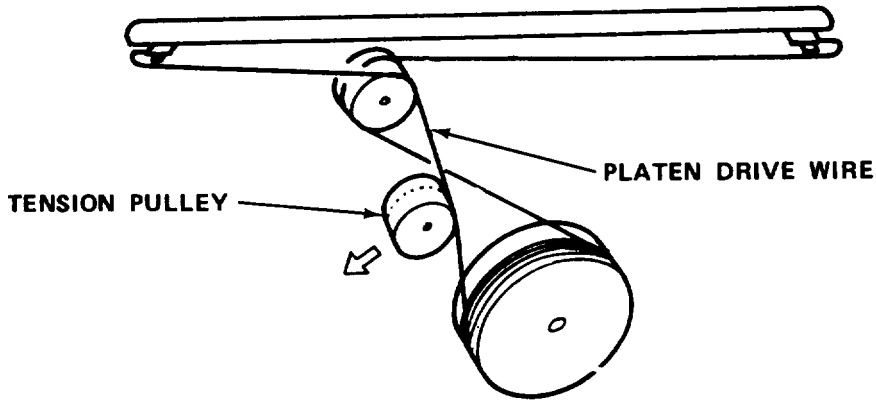
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

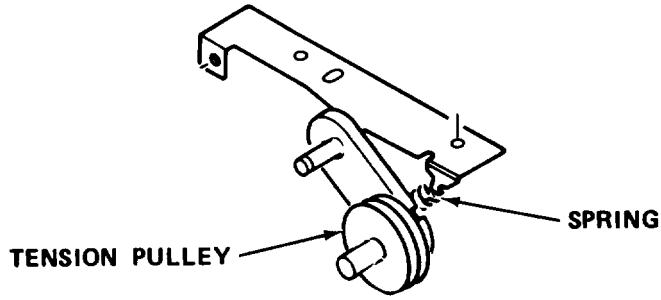
a. Turn power switch to O (OFF).

b. Unplug power cord.

c. Remove upper rear panel.



d. Push tension pulley in direction shown.



e. Remove spring from tension pulley.

NOTE

If there is slack in wire after replacing spring, replace platen drive wire (paragraph 3-20.34).

f. Install new spring in tension pulley.

g. Reinstall upper rear panel.

h. Plug in power cord.

3-20.33 Aline Platen Rail

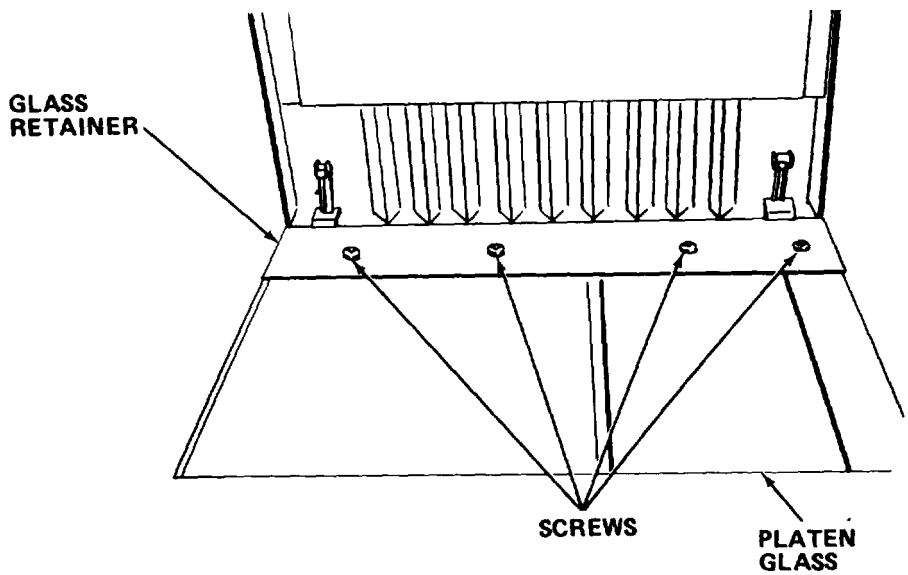
MOS: 35E, Special Electronic Devices Repairer

TOOLS : No. 2 Cross Tip Screwdriver
Feeler Gage

a. Turn power switch to O (OFF).

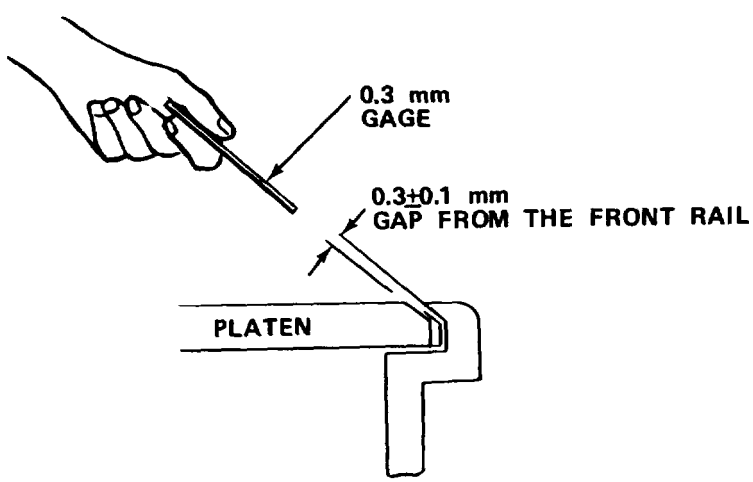
b. Unplug power cord.

c. Raise platen cover.



d. Loosen screws on retaining plate.

e. Aline ends of platen glass and glass retainer.



f. Insert 0.3 mm gage (or 3 sheets of copy paper) at each end between glass and front rail.

g. Pull glass and retainer forward against gage (paper).

h. Tighten retaining screws.

i. Remove gage (paper).

j. Lower platen cover.

k. Plug in power cord.

l. Turn power switch to 1 (ON).

3-20.34 Replace Platen Drive Wire.

MOS: 35E, Special Electronic Devices Repairer

TOOLS : No. 2 Cross Tip Screwdriver
Needle Nose Pliers
Spring Hook

SUPPLIES: Platen Drive Wire
Epoxy Resin (Item 21, Appendix E)

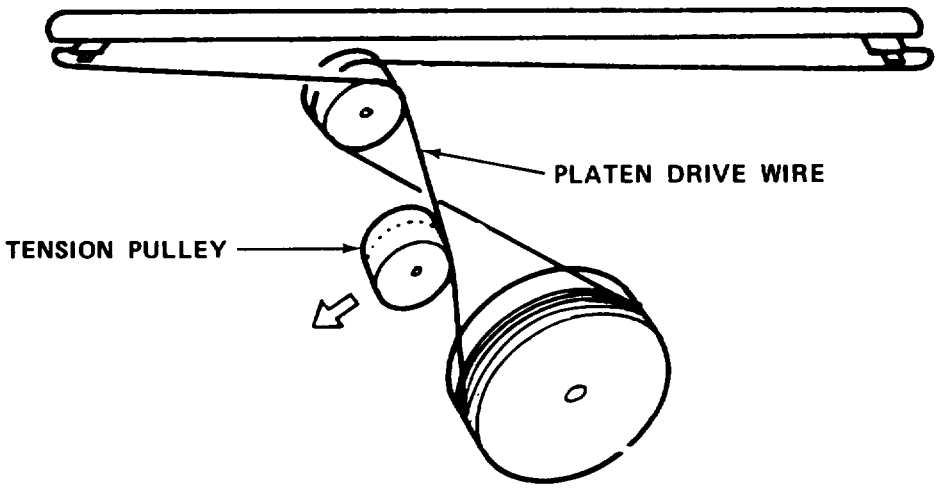
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

b. Unplug power cord.

c. Remove upper rear panel.



d. Push tension pulley in direction shown.

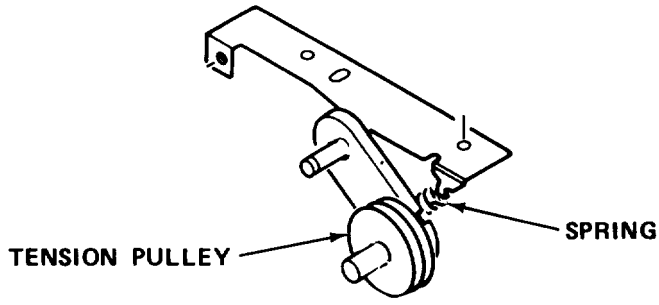
e. Remove platen drive wire from around clutch pulley.

NOTE

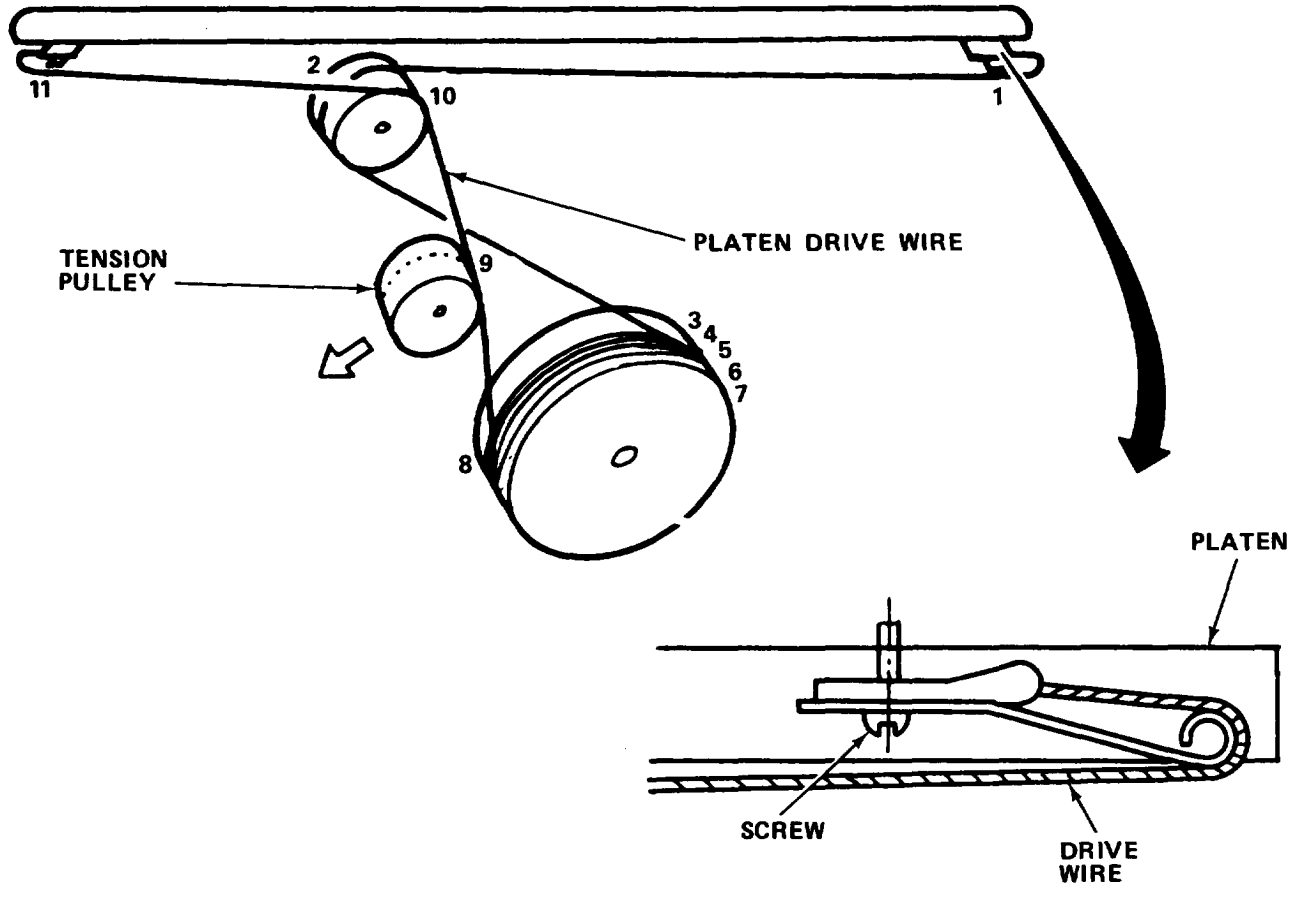
Use pliers to remove wire holder at position 1.

f. Remove wire securing screws at each end of platen.

g. Remove wire from pulleys and wire holder.



h. Remove spring from tension pulley.



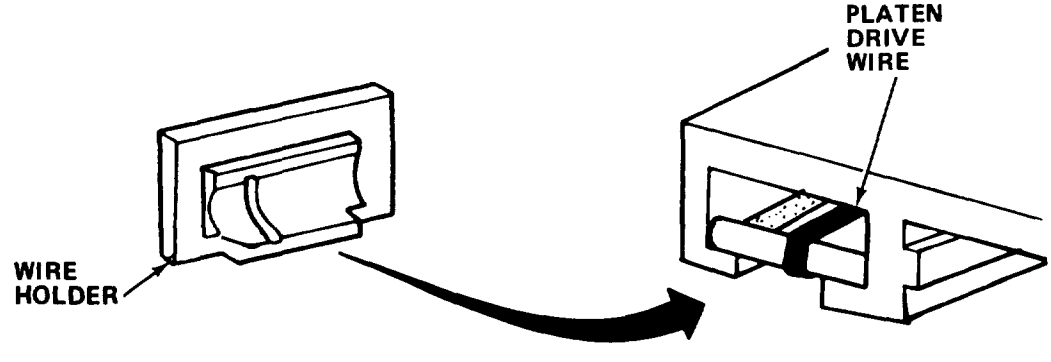
i. Clean wire holder and bent portion of new wire.

j. Secure one end of new platen drive wire to right end of platen (1).

k. At position 2, place wire into inner groove,

l. When passing wire from 2 to 3, do not pass wire around tension pulley. Pass it behind the tension pulley as illustrated.

m. Wind wire around clutch pulley about 4-1/2 turns.



n. Fit wire snugly into wire holder.

o. Reinstall spring in tension pulley.

p. Glue wire holder to platen with epoxy resin.

q. Reinstall upper rear panel.

r. Plug in power cord.

s. Turn power switch to 1 (ON).

3-20.35 Adjust Bottom Roller Pressure (Nip Width).

MOS: 35E, Special Electronic Devices Repairer

TOOLS: 8 mm Combination Wrench
Machinist's Rule

NOTE

This procedure should only be required when either top or bottom fixing roller is replaced or when poor fixing occurs.

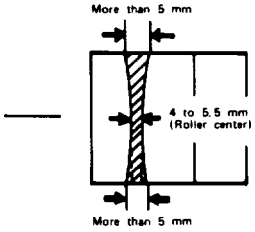
a. Raise copyboard to make an overall black copy.

b. When the leading edge of the copy paper appears at the discharge port, turn the power switch to O (OFF).

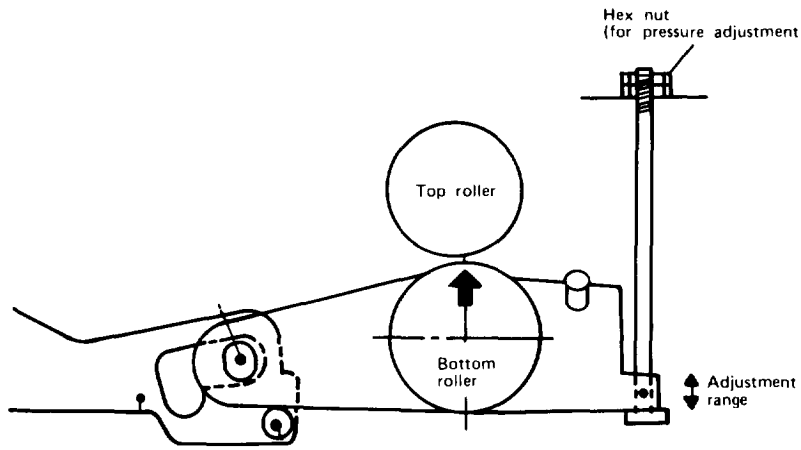
c. Unplug power cord.

d. Move platen to right and raise upper assembly to full open posi tion.

e. Turn the green knob of the fixing assembly to the left a short way, then stop . After a few seconds, remove paper completely by continui ng to turn the green knob left.



f. Measure the width of the glossy toner strip (Nip) width). Width should be 4 to 5.5 mm (0.16 to 0.22 in.) at the center of the paper, over 5 mm (0.20 in.) at both ends, and the difference between the two should be within 0.5 mm (0.02 in.).



FIXING ASSEMBLY

g. If nip width is out of specified limits, remove fixing assembly cover, adjust the hex nuts at the front and rear of the fixing assembly.

h. Reinstall fixing assembly cover.

i. Repeat steps a thru e.

j. Close and latch upper assembly.

k. Return platen to home position.

l. Plug in power cord.

m. Turn power switch to 1 (ON).

3-20.36 Replace Thermistor.

MOS: 35E, Special Electronic Devices Repairer

TOOLS : No. 2 Cross Tip Screwdriver

SUPPLIES: Thermistor

WARNING

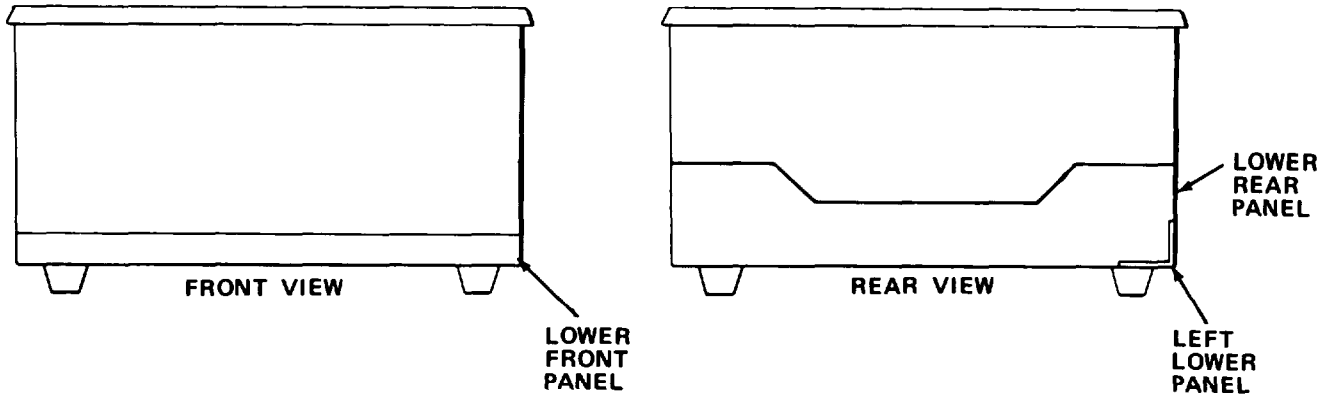
Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

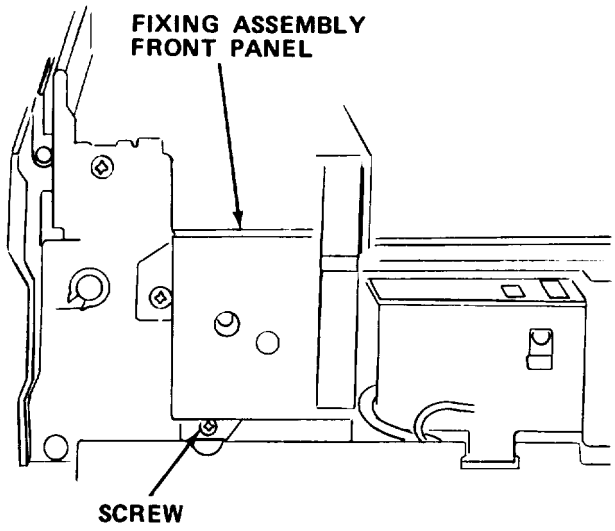
b. Unplug power cord.

c. Slide platen to right.

d. Raise upper assembly to full open position.

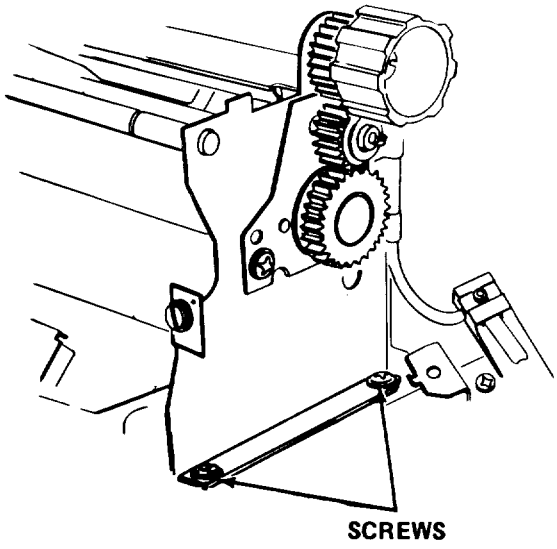


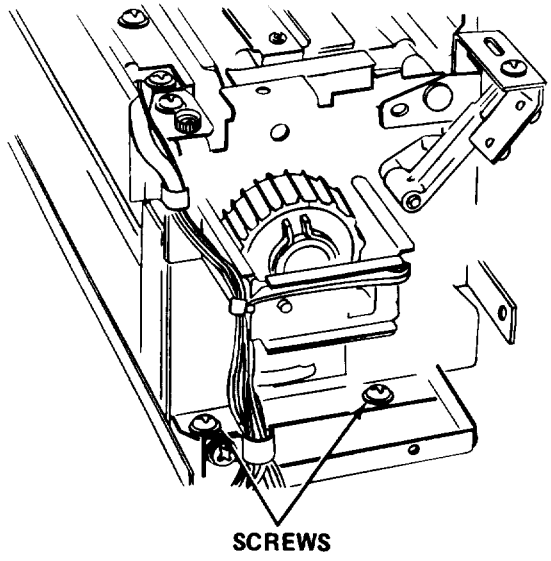
e. Remove lower front and lower rear panels, left lower panel, relay pane and paper tray.



f. Remove fixing assembly front panel.

g. Tag and disconnect all wiring connected to fixing assembly.

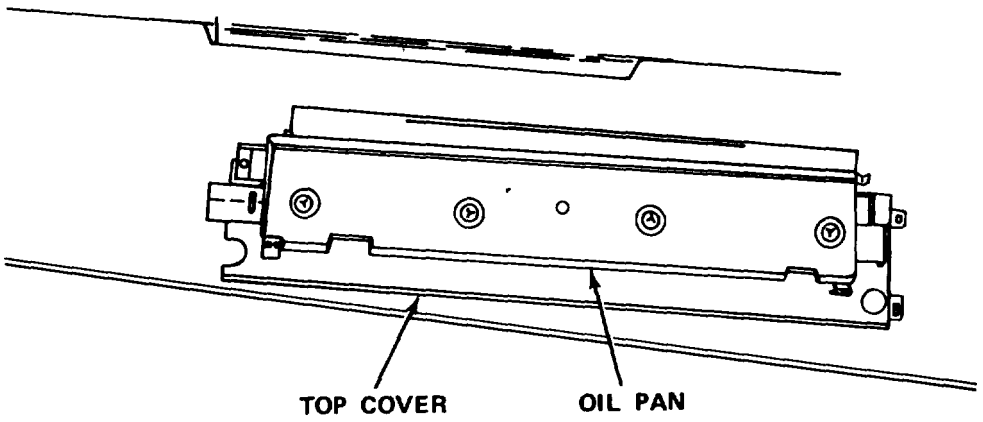




h. Remove fixing assembly mounting screws.

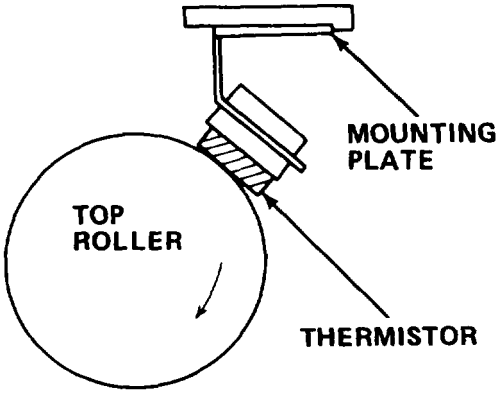
i. Remove assembly and place it on work surface.

j. Remove upper paper guide and top cover of fixing assembly.



k. Remove oil pan and place on inverted top cover of fixing assembly.

l. Remove thermistor mounting plate.



m. Remove defective thermistor.

n. Install new thermistor.

o. Reinstall thermistor mounting plate.

NOTE

Be sure thermistor contacts top roller surface uniformly.

p. Reinstall oil pan.

q. Reinstall high temperature insulating cover.

r. Reinstall fixing assembly in copier.

s. Reinstall fixing assembly mounting screws.

NOTE

When connecting wires, be sure they do not contact any gears, chain, or heater lamp.

t. Reconnect all wiring to fixing assembly and remove tags.

u. Reinstall fixing assembly front panel.

v. Reinstall lower left, lower front, lower rear relay panels and paper tray.

w. Lower and latch upper assembly.

x. Return platen to home position.

y. Plug in power cord.

z. Turn power switch to 1 (ON).

3-20.37 Replace Fixing Assembly Top and Bottom Rollers.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver
1/4 in. Drive Metric Socket Set
Flat Tip Screwdriver
Machinist's Rule
Grip Ring Pliers
Spring Hook

SUPPLIES: Rollers
Silicone Oil S-200 (Item 16, Appendix E)

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch to O (OFF).

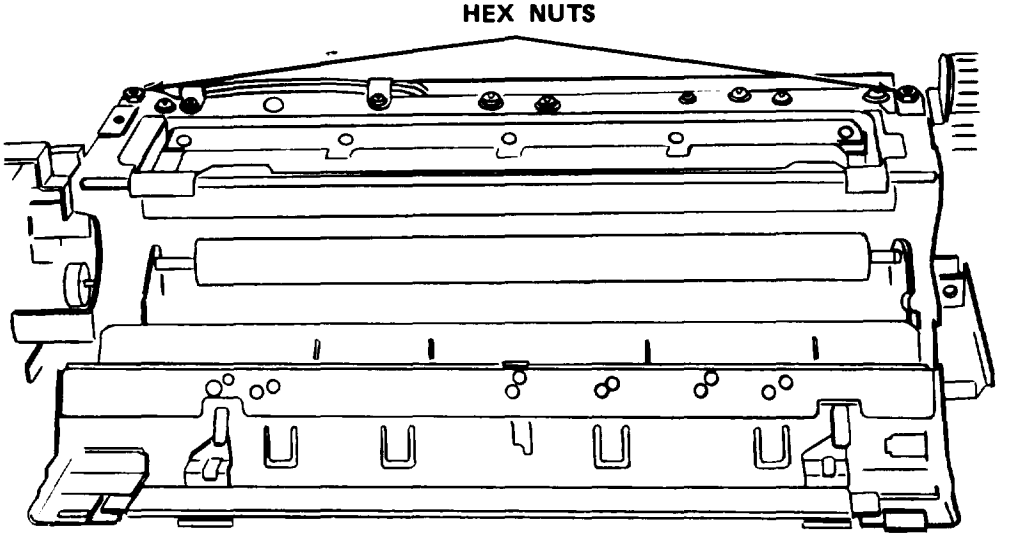
b. Unplug power cord.

c. Slide platen to right.

d. Raise upper assembly to full open position.

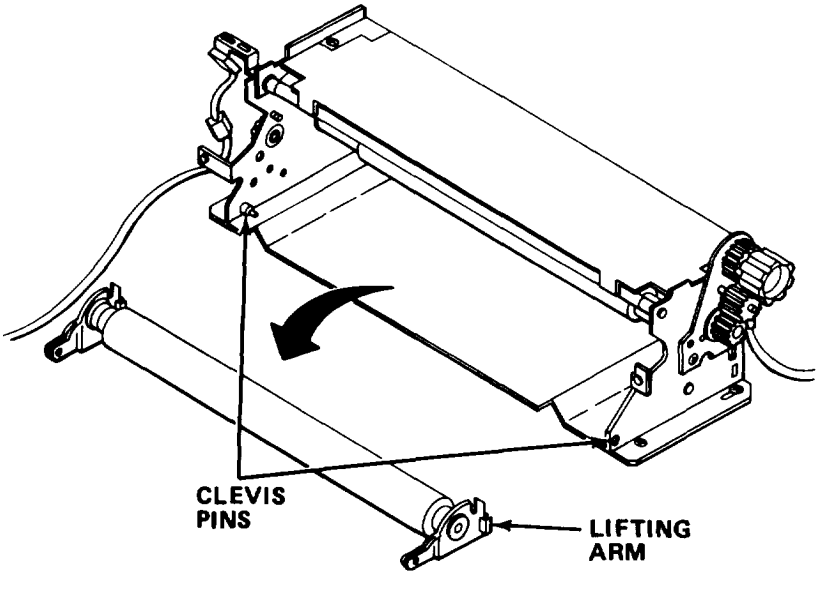
e. Perform steps e thru k of paragraph 3-20.36.

f. Open the paper discharge unit by pushing down the right and left latches.



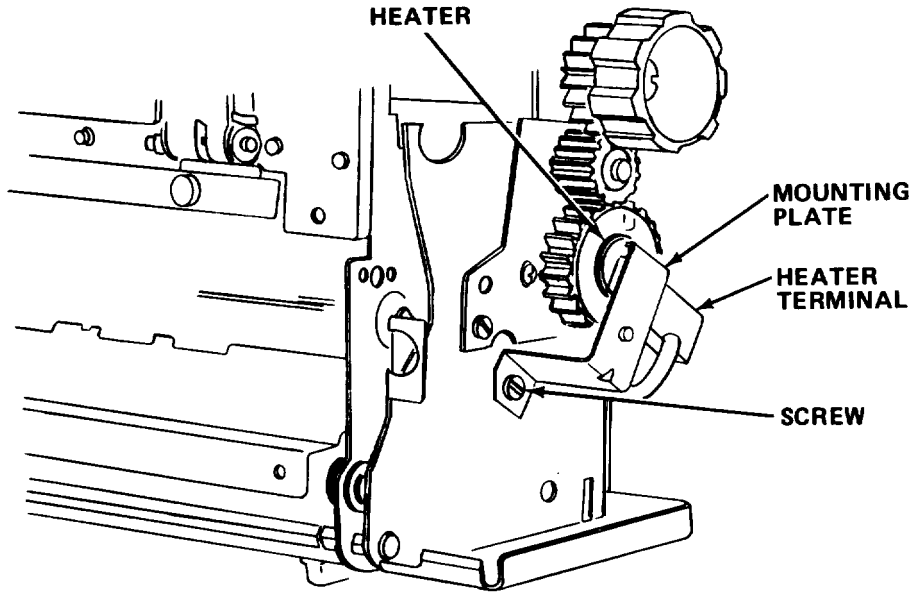
g. Remove top locknuts and loosen right and left pressure adjustment hex nuts.

h. Remove springs from lifting arms.



i. Press down on paper discharge unit until clevis pins can be removed from lifting arms.

j. Remove bottom roller.



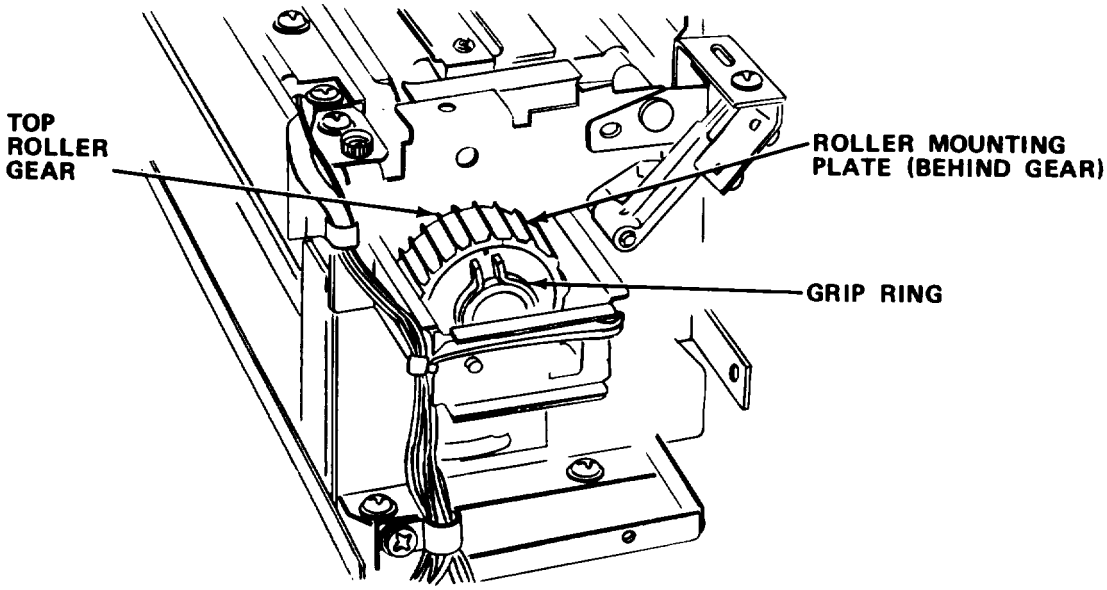
WARNING

Do not try to pull heater out when it is hot. Serious injury could occur.

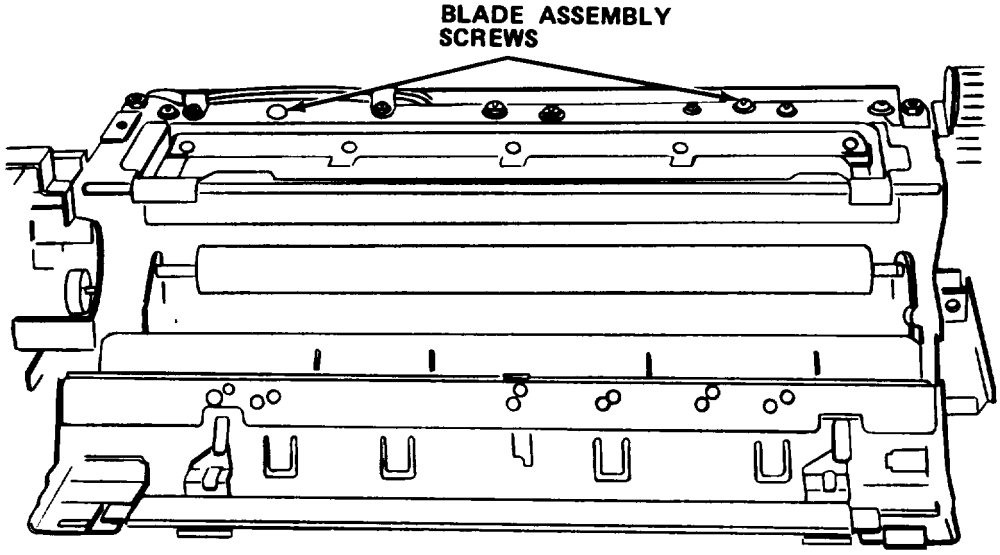
CAUTION

Use clean paper to handle heater. If heater is contaminated by fingerprints or other marks, use dry cloth to wipe it clean. Use alcohol to remove stains. Skin oils will damage heater.

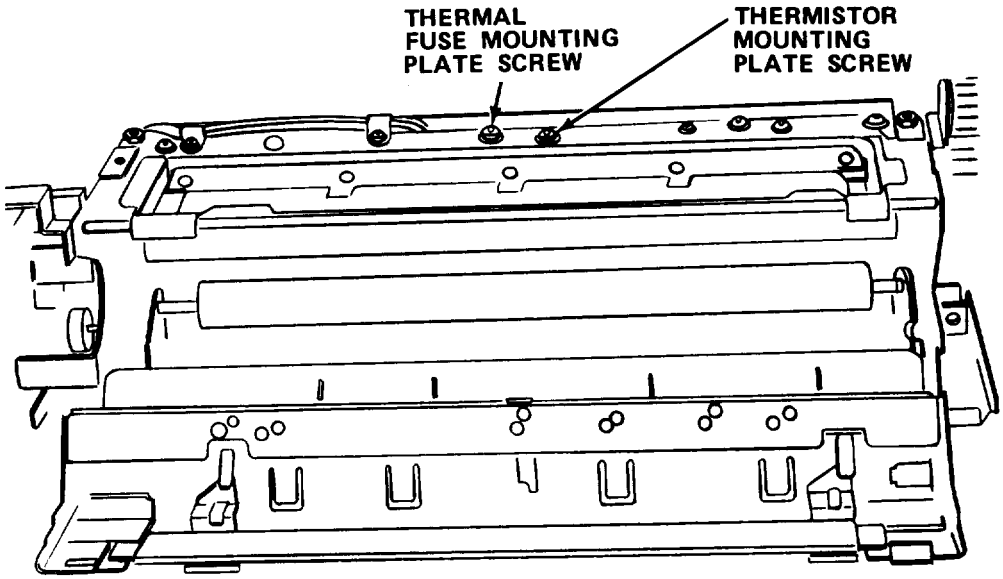
k. Remove heater terminal, mounting plate, and heater.



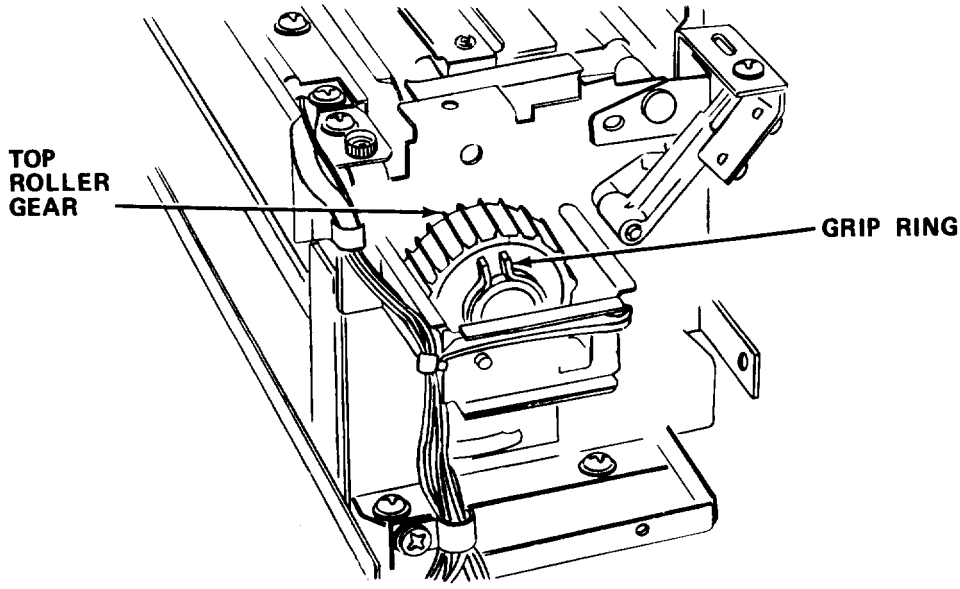
1. Remove grip ring from the top roller gear.



m. Loosen blade assembly screws and remove top roller cleaning blade assembly.



n. Remove upper paper guide; then remove thermal fuse, thermistor, and thermistor mounting plate.



0. Remove top roller gear and top roller mounting plate.

p. Remove top roller.

CAUTION

Wrap new roller with copy paper to prevent contaminating roller surface.

q. Carefully install new top roller into bushing at rear.

r. Reinstall top roller mounting plate, and top roller gear.

NOTE

Be sure thermistor surface contacts the top roller surface uniformly.

s. Reinstall thermistor mounting plate and thermistor.

NOTE

The thermal fuse must be mounted 4.5 ± 0.5 mm (0.18 ± 0.02 in.) from the top roller.

t. Reinstall thermal fuse and top roller cleaning blade assembly.

NOTE

Be sure top roller gear is not installed backward.

u. Reinstall top roller gear and secure with grip ring,

NOTE

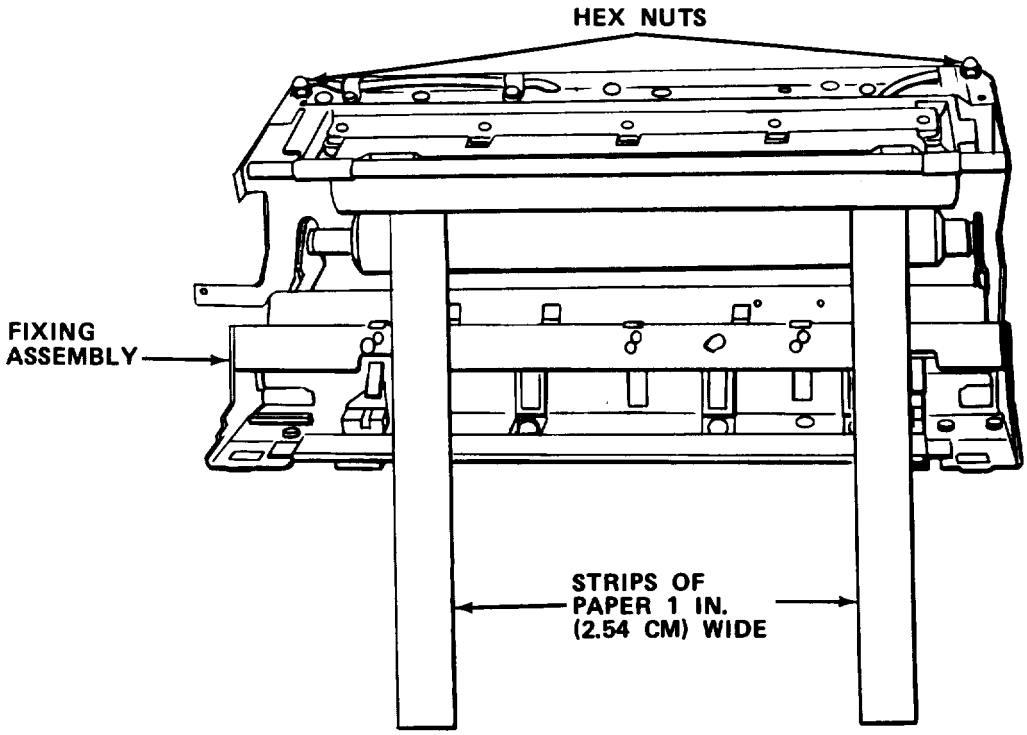
Clean dirt and fingerprints from heater to prolong heater life.

v. Reinstall heater, mounting plate, and heater terminal.

w. Remove bearings and lifting arms from old bottom roller.

x. Install bearing and lifting arms on new bottom roller.

y. Reinstall the bottom roller, clevis pins, and springs.



z. Adjust left and right hex nuts until strips of paper cannot be pulled through rollers without causing rollers to turn.

aa. Reinstall locknuts.

ab. Close paper discharge unit.

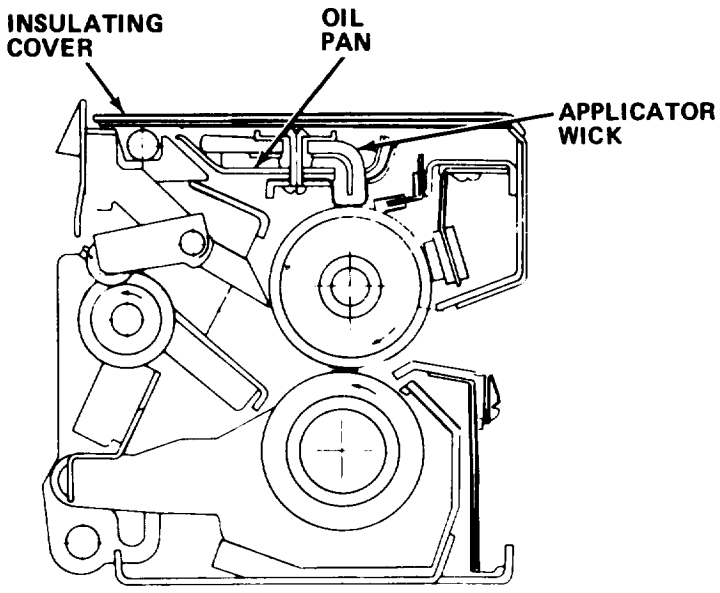
ac. Clean and reinstall paper guide.

ad. Reinstall fixing assembly in copier, and secure attaching screws.

ae. Reconnect all wiring to rear of fixing assembly and remove tags.

NOTE

After completion of this procedure, the nip width adjustment (paragraph 3-20.35) must be accomplished.



af. With end of screwdriver, press down on applicator wick. If very little oil is seen, pour silicone oil evenly over wick.

ag. Reinstall oil pan.

ah. Reinstall insulating cover.

ai. Reinstall front panel on fixing assembly.

aj. Reinstall PC board mounting plate and relay shield.

ak. Reinstall PC board mounting panel.

al. Reinstall lower front panel, upper rear panel, lower rear panel, and lower left panel.

am. Gently lower and latch upper assembly.

an. Return platen to home position.

ao. Plug in power cord.

ap. Turn power switch to 1 (ON).

3-20.38 Adjust Secondary Corona Voltage.

MOS: 35E, Special Electronic Devices Repairer

TOOLS : Flat Tip Screwdriver (4 in.)
Cross Tip Screwdriver (4 in.)

SUPPLIES: Copy Paper
Rubber Matting

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury could result.

a. Turn power switch to O (OFF).

b. Remove right side panel.

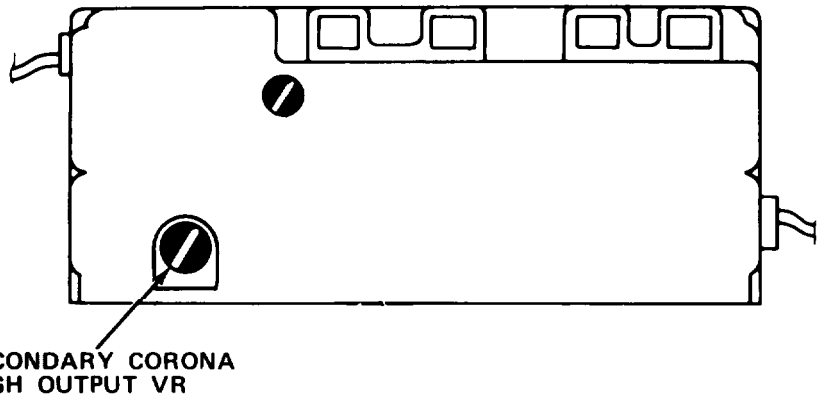
c. Insert cassette filled with paper.

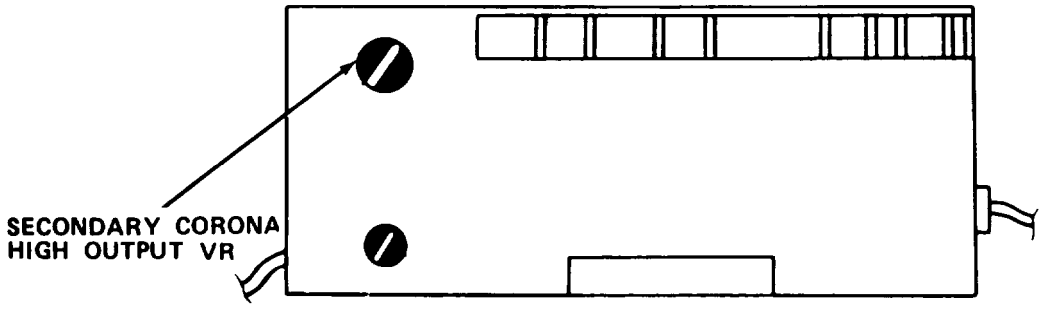
d. Turn power switch to 1 (ON).

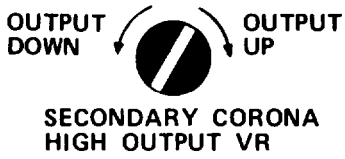
e. Set exposure control lever to 5.

f. Set copy number display via key strip to 5.

g. Press COPY START key when WAIT/STANDBY indicator stops flashing.







h. Check copies for fogging.

i. Adjust secondary corona output until no fogging occurs.

j. Turn power switch to O (OFF).

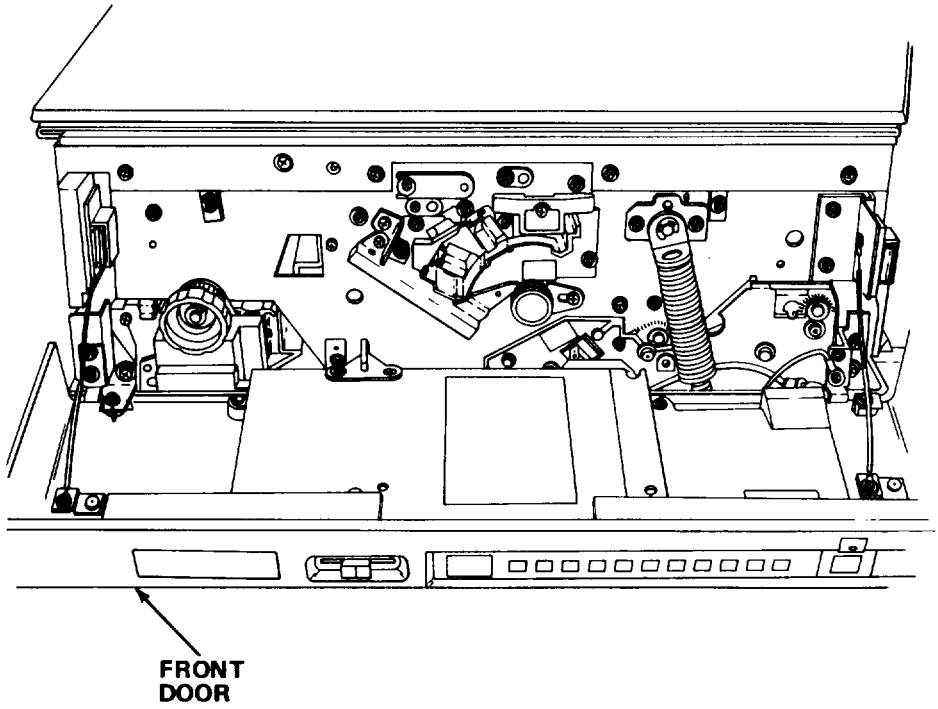
k. Reinstall right side cover.

3-20.39 Replace Secondary Corona.

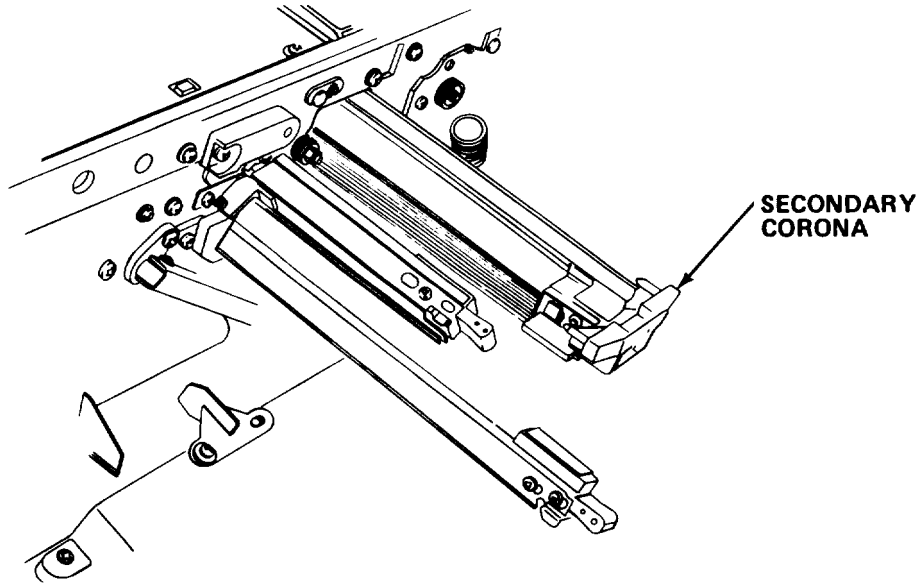
MOS: 35E, Special Electronic Devices Repairer

SUPPLIES: Cheesecloth (Item 7, Appendix E)
Secondary Corona

a. Turn power switch to O (OFF).



b. Open front door.



c. Pull out secondary corona and discard.

d. Inspect new secondary corona wire for kinks, bends, and peeled plating.

e. Wipe secondary corona frame and wire with dry cheesecloth.

f. Install new secondary corona.

g. Close front door.

h. Turn power switch to 1 (ON).

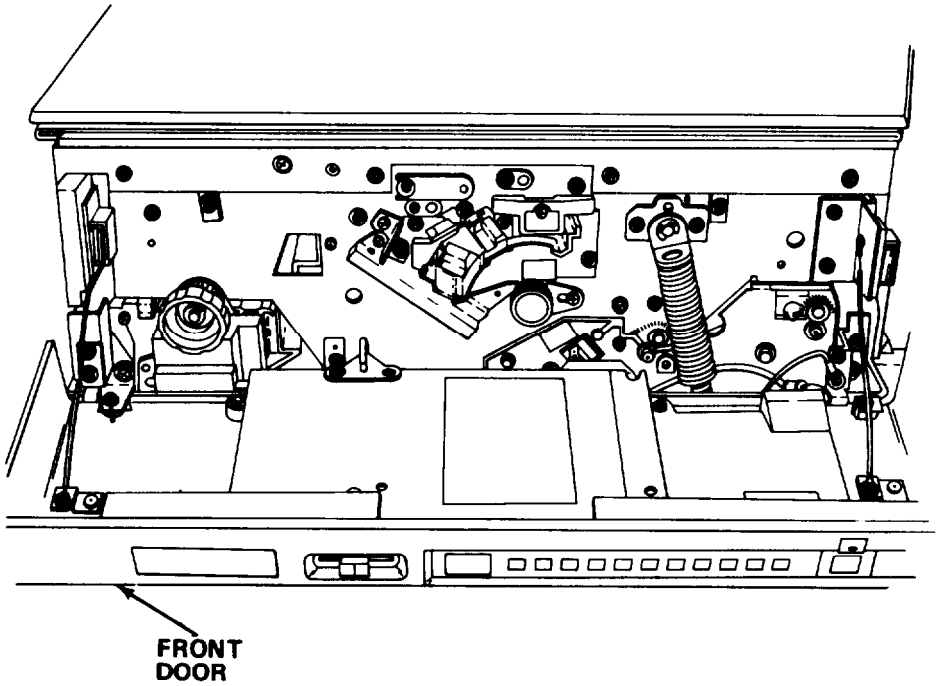
3-20.40 Adjust Height of Primary Corona Wire.

MOS: 35E, Special Electronic Devices Repairer

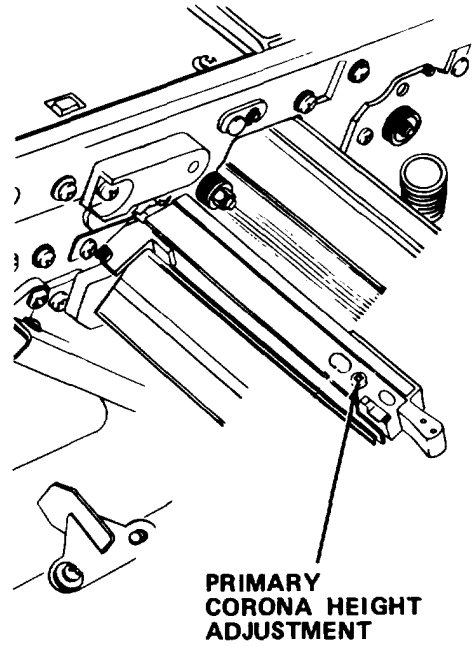
TOOLS: Machinist's Rule
No. 2 Cross Tip Screwdriver.

SUPPLIES: Cheesecloth (Item 7. Appendix E)
Denatured Alcohol (Item 4, Appendix E)

a. Turn power switch to O (OFF).



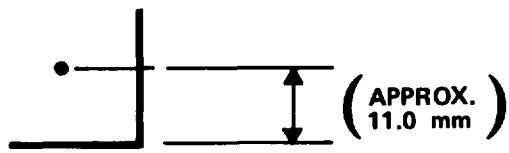
b. Open front door.



c. Pull out primary corona.

Table 3-6. PRIMARY CORONA HEIGHT

Standard Position	Tolerance	Applied Voltage
Raise/lower the wire (relative to the indication on the cable) as indicated on the aluminum foil bag of the new drum.	±2 mm	+6.3 kV



d. Adjust height of corona wire by turning screw located on back or side of corona. One complete turn adjusts height by 1 mm (0.04 in.).

e. Check that corona wire is free of kinks, bends, or peeled plating.

f. Wipe corona wire with cheesecloth moistened with alcohol.

g. Reinstall corona.

h. Close front door.

i. Turn power switch to 1 (ON).

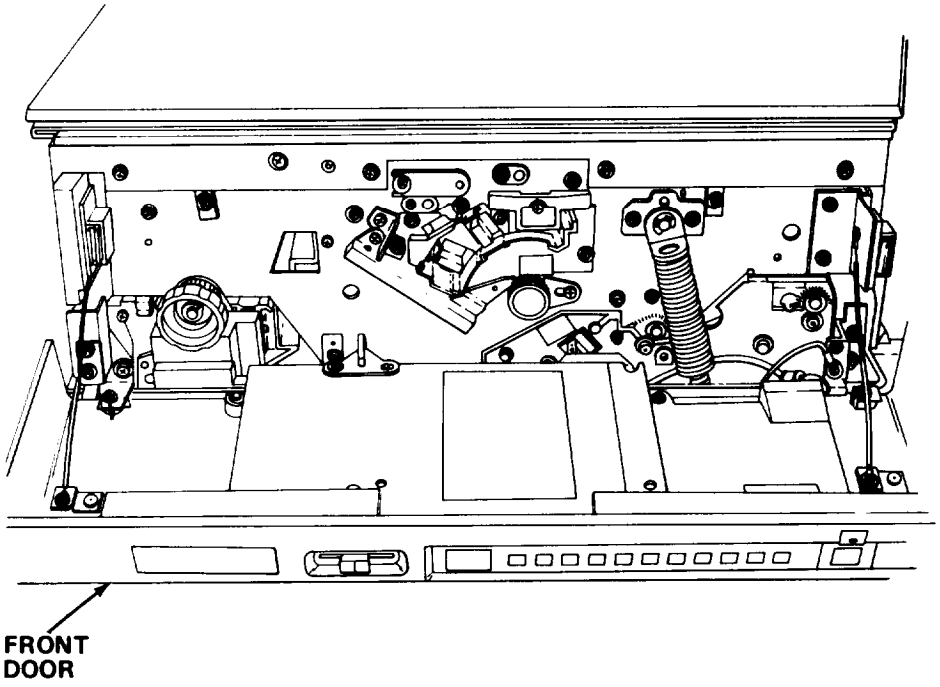
3-20.41 Replace Primary Corona.

MOS: 35E, Special Electronic Devices Repairer

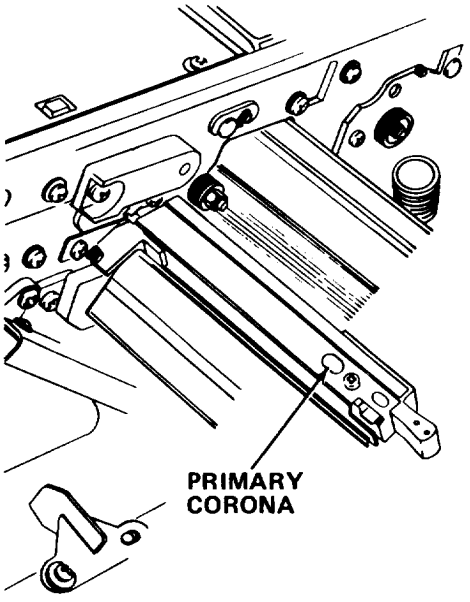
SUPPLIES: Cheesecloth (Item 7, Appendix E)
Primary Corona

a. Turn power switch to O (OFF).

b. Open front door.



c. Pull out primary corona and discard.



d. Check that new primary corona is free of kinks, bends, or peeled plating.

e. Wipe wire with cheesecloth.

f. Reinstall primary corona and adjust (paragraph 3-20.40).

g. Close front door.

h. Turn power switch to 1 (ON).

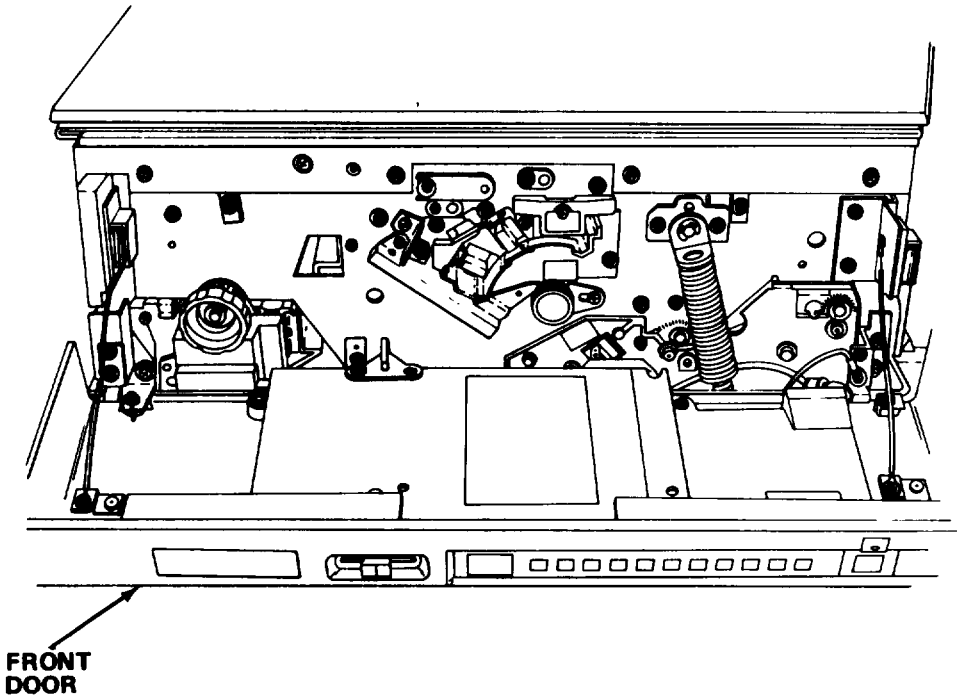
3-20.42 Adjust Prescan Corona Height.

MOS: 35E, Special Electronic Devices Repairer

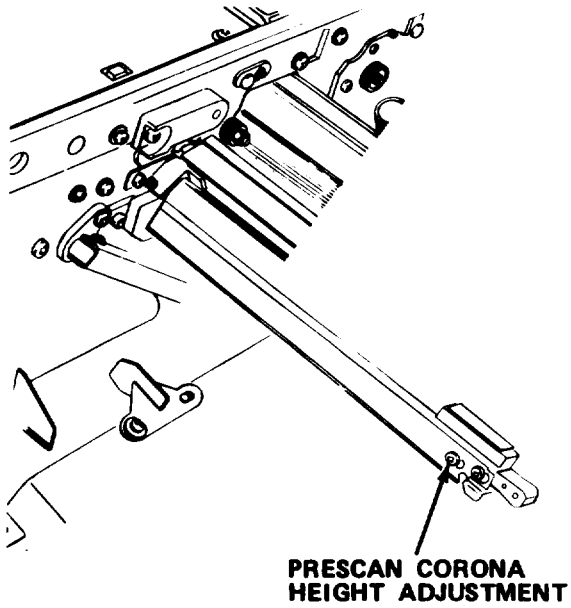
TOOLS: No. 2 Cross Tip Screwdriver
Machinist's Rule

SUPPLIES: Cheesecloth (Item 7, Appendix E)
Denatured Alcohol (Item 4, Appendix E)

a. Turn power switch to O (OFF).

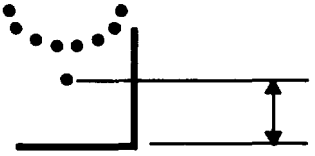


b. Open front door.



c. Remove prescan corona.

Table 3-7. PRESCAN CORONA HEIGHT

	Standard Position	Tolerance	Applied Voltage
	11.5 mm	±2 mm	-5.1 kV

NOTE

To adjust the height of the corona wire, turn screw located on the side of the corona.

d. Adjust height of corona.

e. Check that corona wire is free of kinks, bends, or peeled plating.

f. Clean corona with cheesecloth moistened with alcohol.

g. Reinstall corona assembly.

h. Close front door.

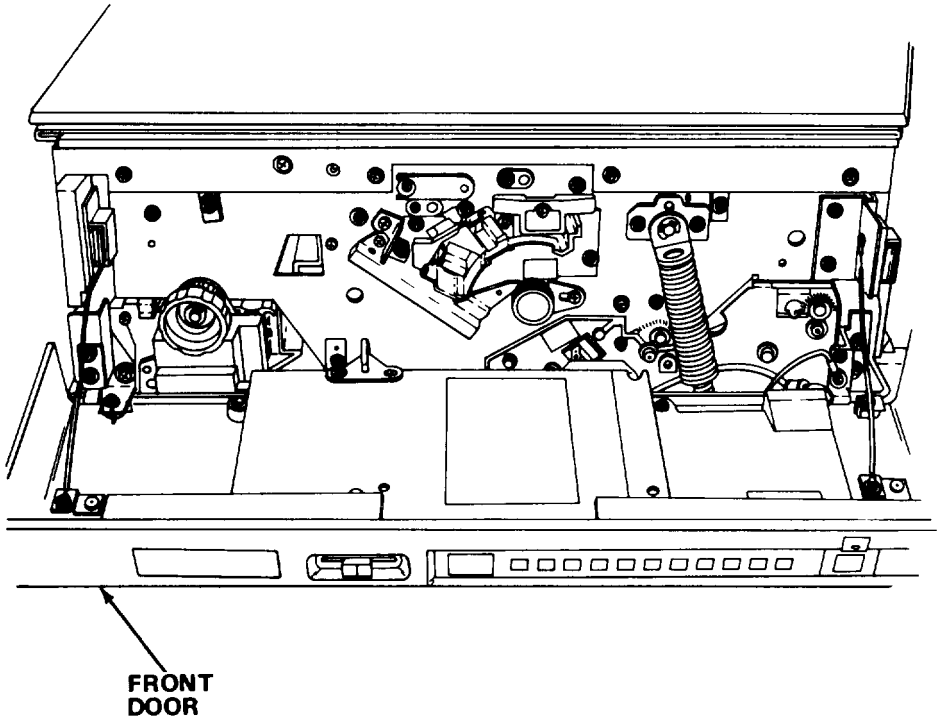
i. Turn power switch to 1 (ON).

3-20.43 Replace Prescan Corona.

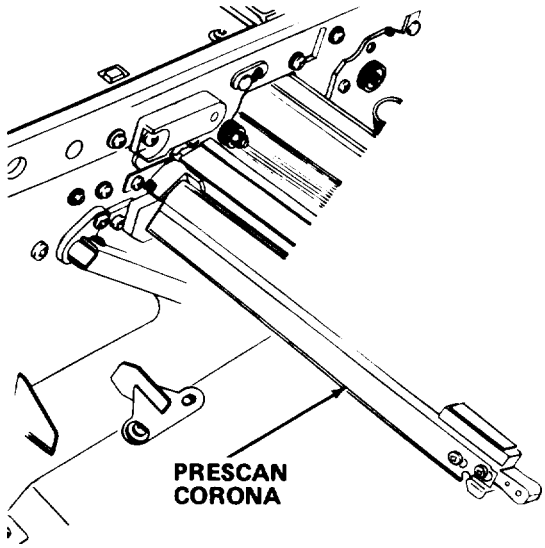
MOS: 35E, Special Electronic Devices Repairer

SUPPLIES: Cheesecloth (Item 7, Appendix E)
Prescan Corona

a. Turn power switch to O (OFF).



b. Open front door.



c. Remove prescan corona and discard.

d. Check that new prescan corona wire is free of kinks, bends, and peeled plating.

e. Wipe new prescan corona with cheesecloth.

f. Perform adjustment procedure (paragraph 3-20.42) if necessary.

g. Install new prescan corona.

h. Close front door.

i. Turn power switch to 1 (ON).

3-20.44 Adjust Transfer Corona Height.

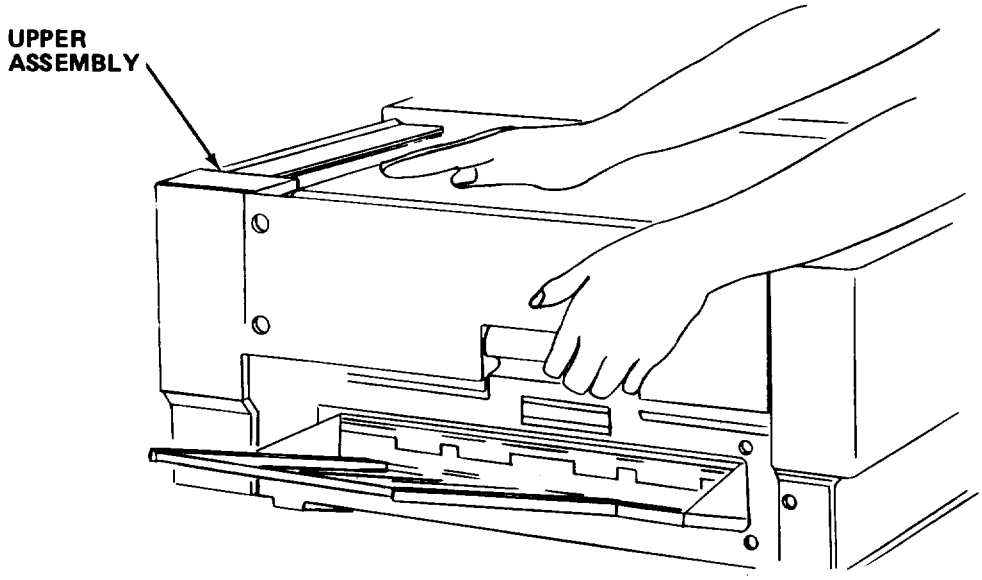
MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver
Machinist's Rule

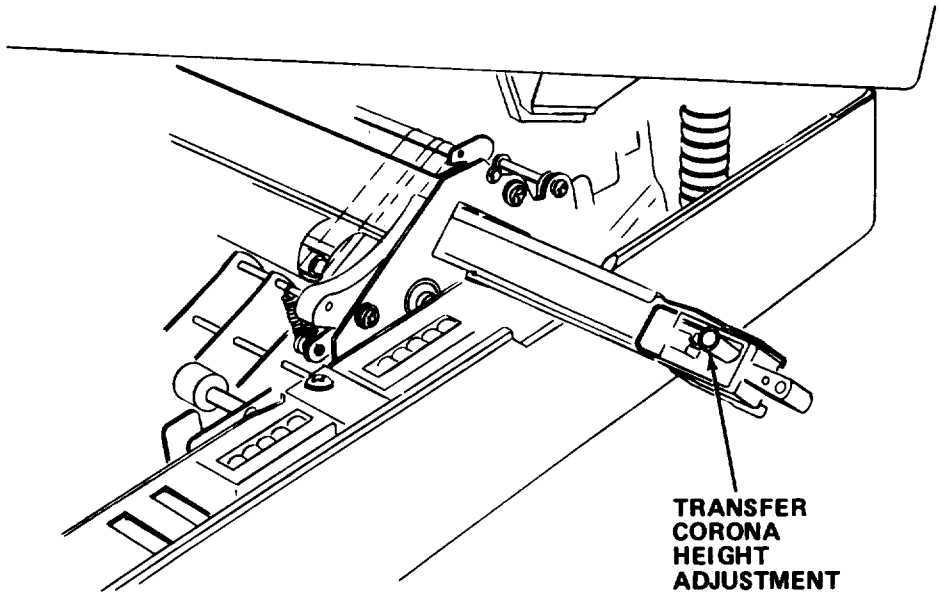
SUPPLIES: Cheesecloth (Item 7, Appendix E)

a. Turn power switch to O (OFF).

b. Slide platen to right.

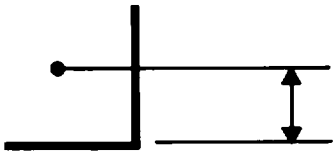


c. Raise upper assembly to full open position.



d. Remove transfer corona.

Table 3-8. TRANSFER CORONA HEIGHT

Standard Position	Tolerance	Applied Voltage
 9.5 mm	±2 mm	+6.3 kV

NOTE

To adjust corona wire height, turn screw located on the side of corona assembly.

e. Adjust corona wire height.

f. Inspect corona wire for kinks, bends, or peeling plating.

g. Clean corona wire with cheesecloth.

h. Reinstall transfer corona.

i. Lower upper assembly and press it down with both hands until it latches securely.

j. Return platen to home position.

k. Turn power switch to 1 (ON).

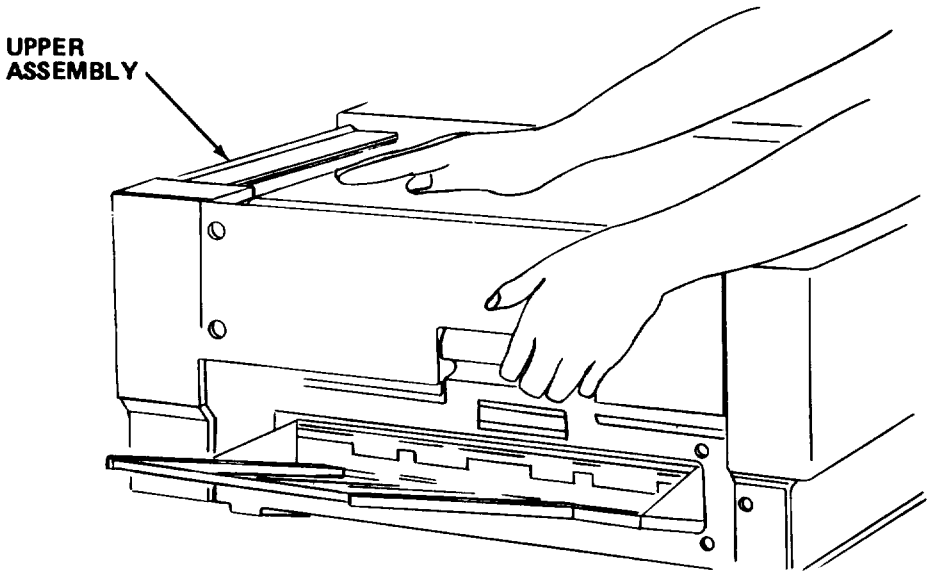
3-20.45 Replace Transfer Corona.

MOS: 35E, Special Electronic Devices Repairer

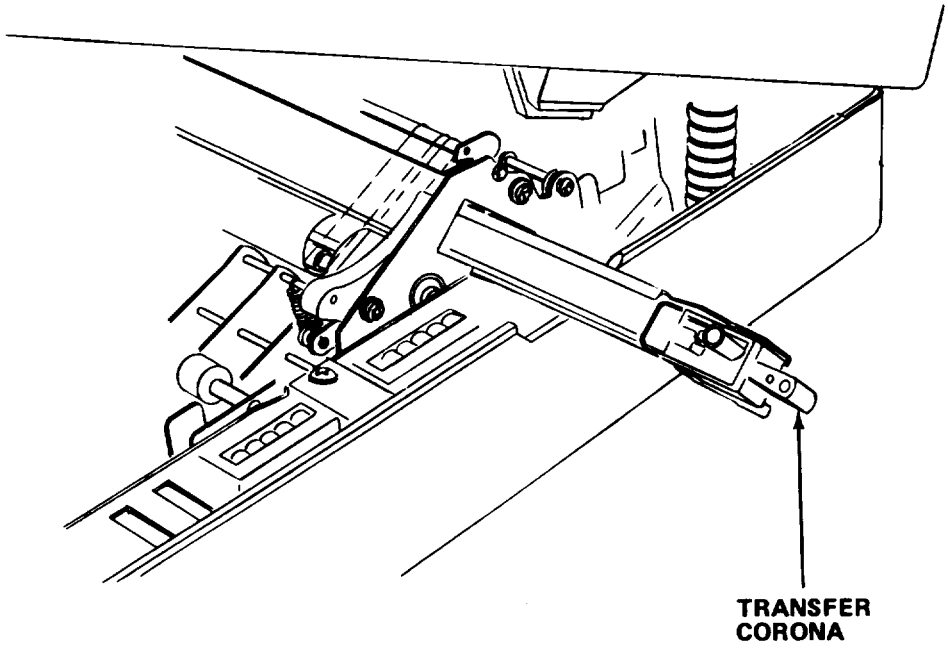
SUPPLIES: Transfer Corona
Cheesecloth (Item 7, Appendix E)

a. Turn power switch to O (OFF).

b. Slide platen to right.



c. Raise upper assembly to full open position.



d. Remove transfer corona and discard.

e. Inspect corona wire for kinks, bends, or peeling plating.

f. Clean corona wire with cheesecloth.

g. Perform adjustment procedure (paragraph 3-20.44) if necessary.

h. Install new transfer corona.

i. Lower upper assembly and press it down with both hands until it latches securely.

j. Return platen to home position.

k. Turn power switch to 1 (ON).

3-20.46 Replace Drum Heater Terminals

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Cross Tip Screwdriver (6 in.)
Slip Joint Pliers
Flat Tip Screwdriver (3 in.)

SUPPLIES: Heater Fuse
Heater Terminals

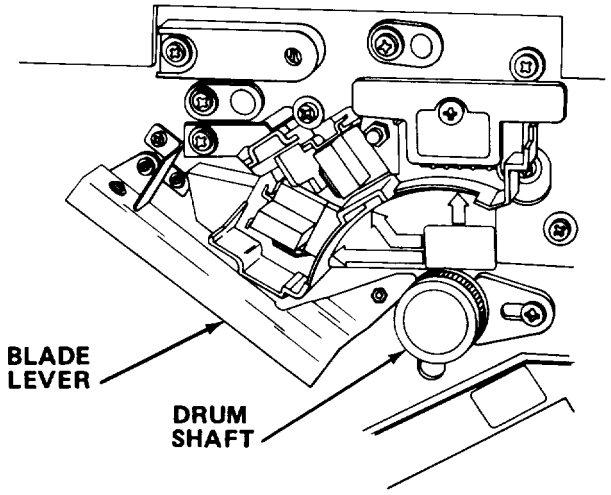
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

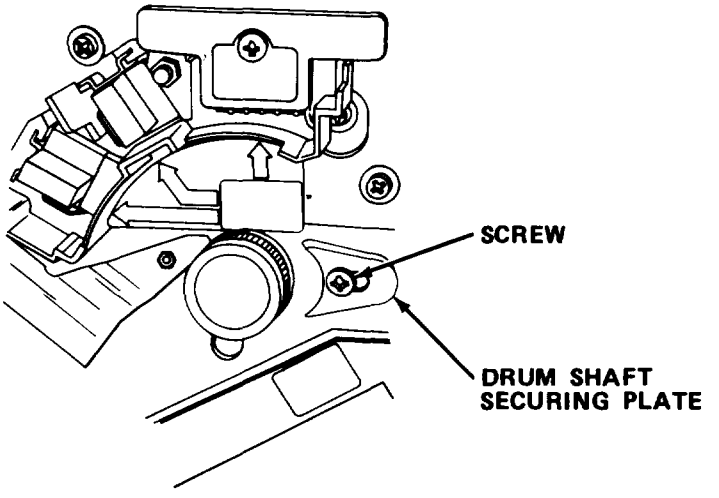
a. Turn power switch to O (OFF).

b. Unplug power cord.

c. Open front door.



d. Lift lever that holds blade of developing unit in place, out of groove in drum shaft. Pull lever outward, clear of end of drum shaft, and lower it to its rest position. Check that stud engages in hole.



e. Loosen, but do not remove, screw of drum shaft securing plate, and slide plate to right, free of groove in shaft.

WARNING

Drum may be hot and can cause personal injury.

CAUTION

. To prevent damage, use cloth or paper to hold drum while removing it.

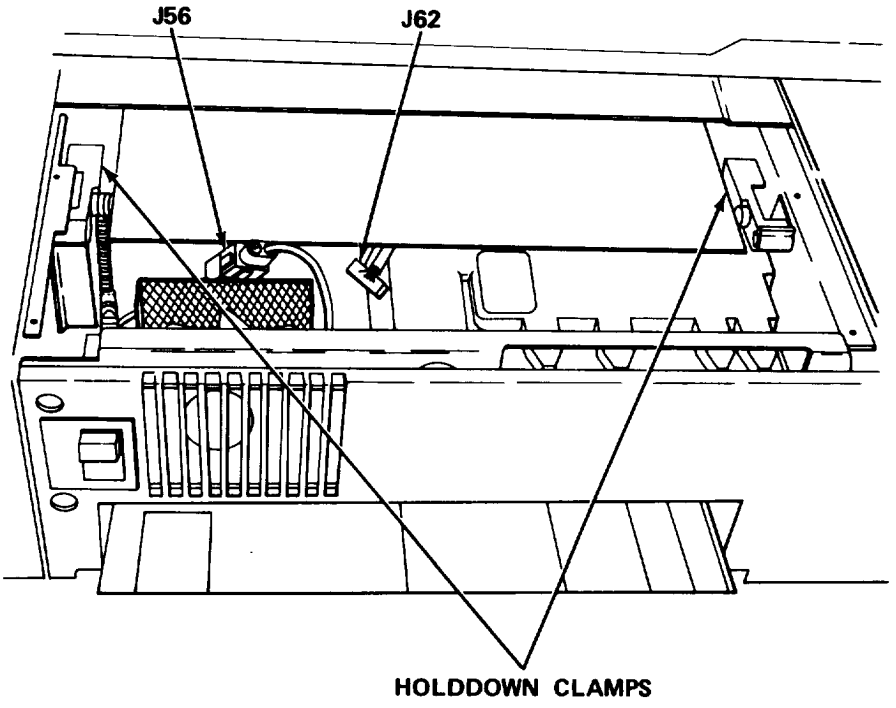
. Store removed drum in area away from direct sunlight, dust, ammonia, and possibility of impact damage.

f. Pull out drum shaft.

g. Slide platen all the way to right and raise upper unit.

h. Remove drum.

i. Lower upper unit and move platen to left, then remove upper right panel.



j. Raise two developer assembly holddown clamps.

k. Unplug connectors.

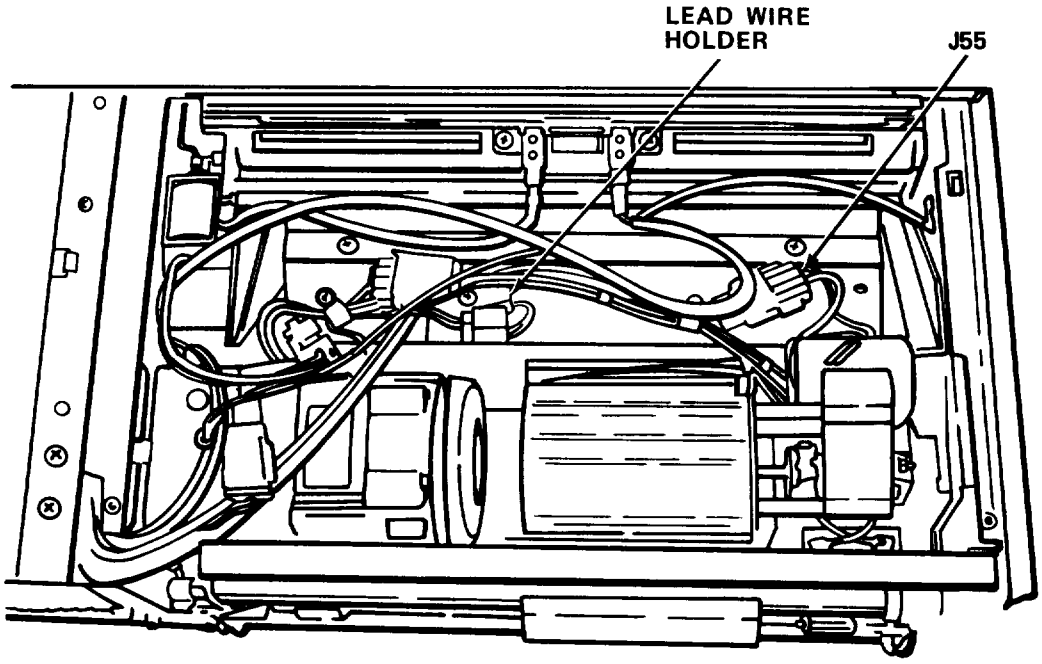
l. Slowly lift developer assembly up and remove it.

m. Place developer assembly on desk covered with copy paper to prevent any foreign matter from being attracted to developer assembly.

n. Lower two holddown clamps and move platen to the right.

o. Remove upper left panel.

p. Remove ozone filter.



q. Remove screw and lead wire holder, and unplug connector J55.

r. Raise upper unit to full open position.

s. Place large sheet of paper over bottom of copier.

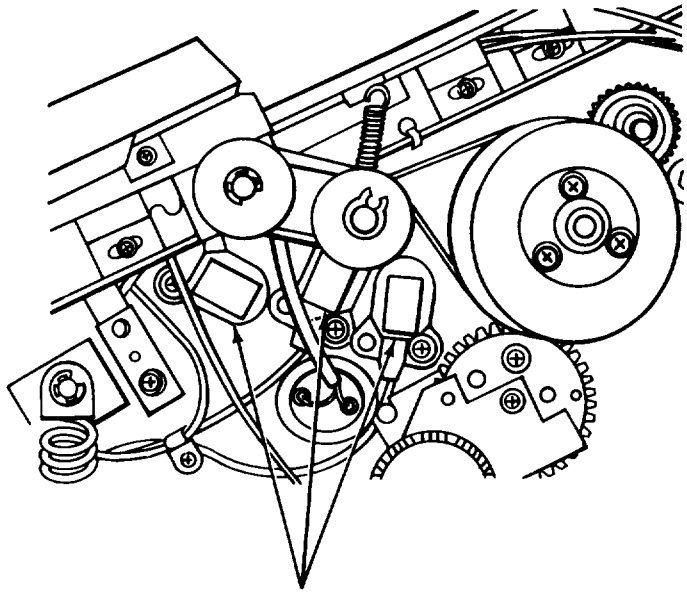
t. Remove blade lever.

CAUTION

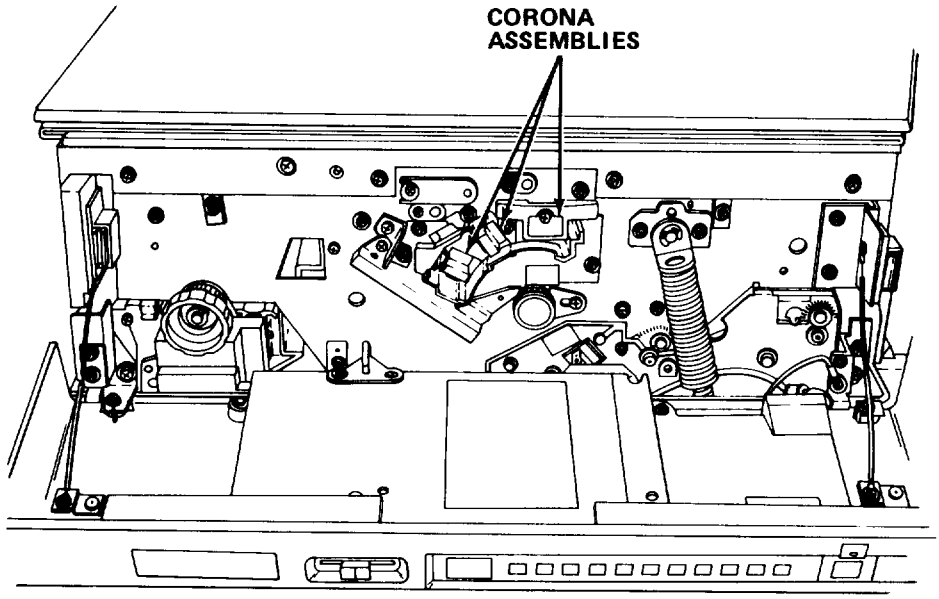
When setting the cleaner assembly down, be careful not to damage the rowel.

u. Support cleaner assembly with both hands. Then lift and withdraw it.

REAR VIEW



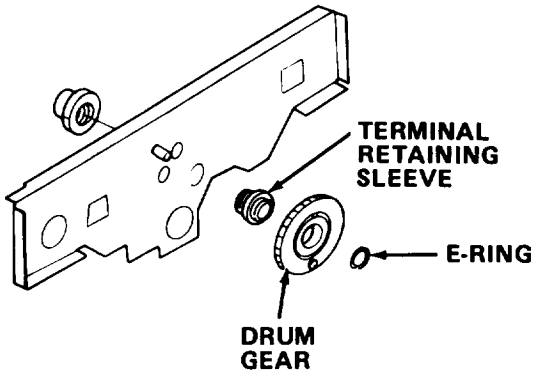
FRONT VIEW



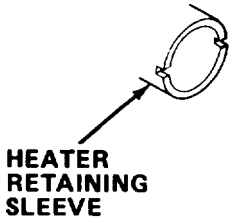
v. Remove corona assemblies.

w. Remove upper rear panel.

x. Tag and remove wires on heater terminals.



y. Remove E-ring on inside of copier retaining drum gear and pull drum gear off sleeve.



z. Remove retaining sleeve (using lead wire holder removed in step q).

aa. After retaining sleeve is removed, heater terminal block can be taken out.

ab. Insert new heater terminal, reinstall and tighten retaining sleeve.

ac. Reinstall drum gear on sleeve. Reinstall E-ring.

ad. Connect wires to new heater terminals and remove tags.

ae. Reinstall upper rear panel.

af. Reinstall corona assemblies.

ag. Use both hands to reinstall cleaner assembly, then remove paper from bottom of copier.

ah. Reconnect J55. Reinstall screw and lead wire holder.

ai. Reinstall ozone filter.

aj. Reinstall blade lever.

ak. Close upper unit.

al. Reinstall upper left panel.

am. Slide platen to the left.

an. Reinstall developer assembly.

ao. Reconnect connectors.

ap. Lower holddown clamps.

aq. Reinstall upper right panel.

ar. Slide platen to the right and raise upper unit to full open position.

CAUTION

- To prevent drum damage, wrap a piece of paper around the drum and insert it into the machine. Remove the paper and be sure to slide drum all the way to the front of the machine; then lower the upper unit.

Ž Push drum to front of machine to prevent gear damage.

as. Reinstall drum and lower upper unit.

at. Reinstall drum shaft.

au. Slide drum shaft securing plate into groove in drum shaft and tighten screw.

av. Raise upper unit. Without touching drum surface, turn drum to the left until it stops.

aw. Position blade lever into groove in drum shaft.

ax. Close upper assembly.

ay. Return platen to home position.

az. Close front door.

ba. Plug in power cord.

bb. Turn power switch to 1 (ON).

3-20.47 Replace Drum Heater.

MOS: 35E, Special Electronic Devices Repairer

TOOLS : No. 2 Cross Tip Screwdriver (4 in.)
Flat Tip Screwdriver (3 in.)
Multimeter

SUPPLIES: Drum Heater

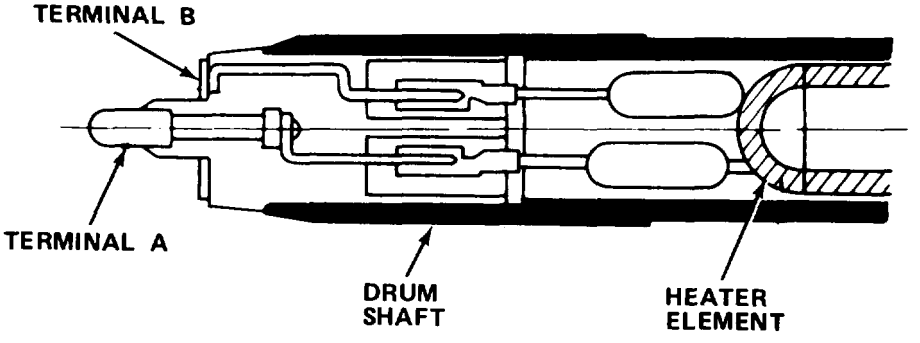
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

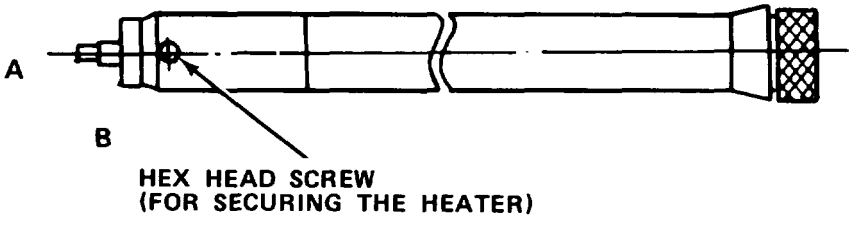
a. Perform steps a thru f of paragraph 3-20.46.

WARNING

Drum shaft may be hot and can cause personal injury. Use cloth to handle drum shaft.



b. Check for continuity of heater element between terminals A and B with multimeter.

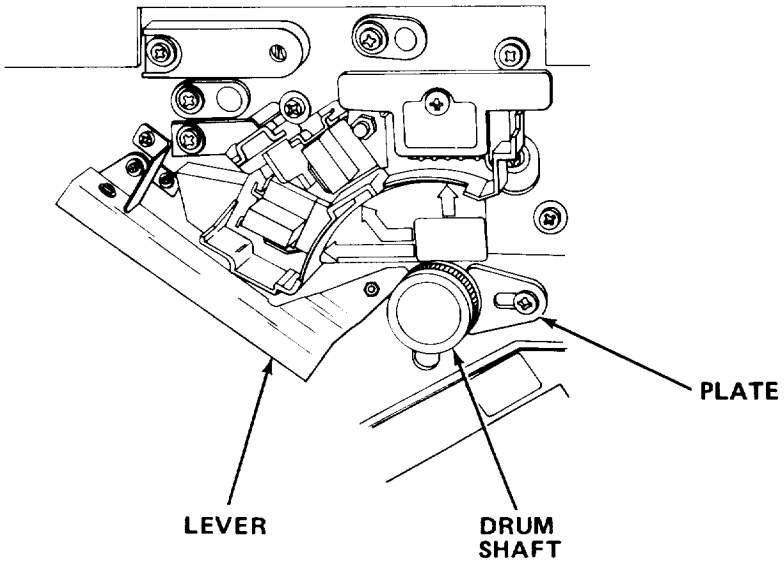


c. Remove setscrew securing heater in place.

d. Discard heater.

e. Secure new heater to terminals A and B using setscrew.

f. Reinstall drum shaft.



g. Slide securing plate to left and place it in groove on drum shaft.

h. Tighten screw on drum shaft securing plate.

i. Lift blade lever upward and place it into groove on drum shaft.

j. Close front door.

k. Plug in power cord.

1. Turn power switch to 1 (ON).

3-20.48 Replace Photosensitive Drum.

MOS: 35E, Special Electronic Devices Repairer

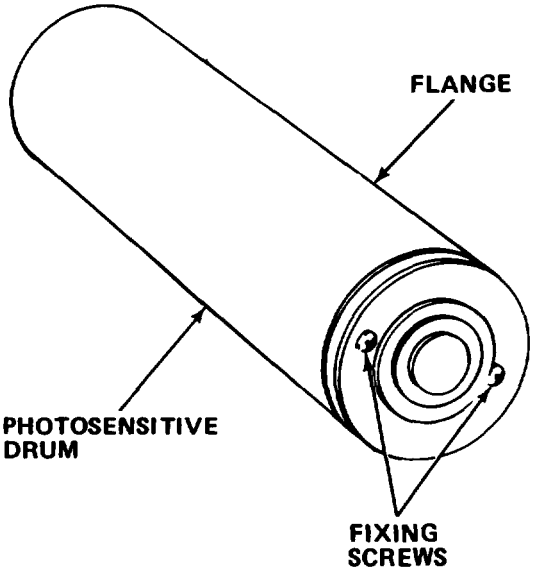
TOOLS: No. 2 Cross Tip Screwdriver (3 in.)

SUPPLIES: Copy Paper
Photosensitive Drum
Cheesecloth (Item 7, Appendix E)
Denatured Alcohol (Item 4, Appendix E)
Drum Cleaning Powder (Item 10, Appendix E)

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Perform steps a thru h of paragraph 3-20.46.



b. Remove two flange fixing screws from flange.

NOTE

Both flanges are identical.

c. Remove flange from each end of photosensitive drum.

CAUTION

Wrap sheet of copy paper around new photosensitive drum to protect it. Do not touch yellow surface or hit surface of photosensitive drum. Drum can be damaged or contaminated.

NOTE

Be sure screws line up straight thru entire length of drum to avoid warping the drum.

d. Place flanges in ends of new photosensitive drum and reinstall screws.

CAUTION

- Do not allow photosensitive drum to touch gear shaft. Gear shaft may touch drum and contaminate it, rendering it useless.
- To prevent gear damage, the drum should be pushed to front of machine.

NOTE

- Store removed drum in a place away from direct sunlight, dust, ammonia, or anything that might scratch surface.
- If drum surface is scratched, the drum must be replaced.
- After drum replacement, corona wires should be set to specifications as indicated on panel inside front door.

e. Clean and install new photosensitive drum in drum cradle.

f. Lower and latch upper assembly.

g. Reinstall drum shaft.

h. Position securing plate in groove in shaft and tighten screw.

i. Raise upper assembly to full open position.

j. Manually rotate drum to the left until it stops. Avoid touching the yellow portion of the drum.

k. Close the upper assembly.

1. Raise blade lever and position in groove in drum shaft.

m. Close front door.

n. Plug in power cord.

o. Turn power switch to 1 (ON).

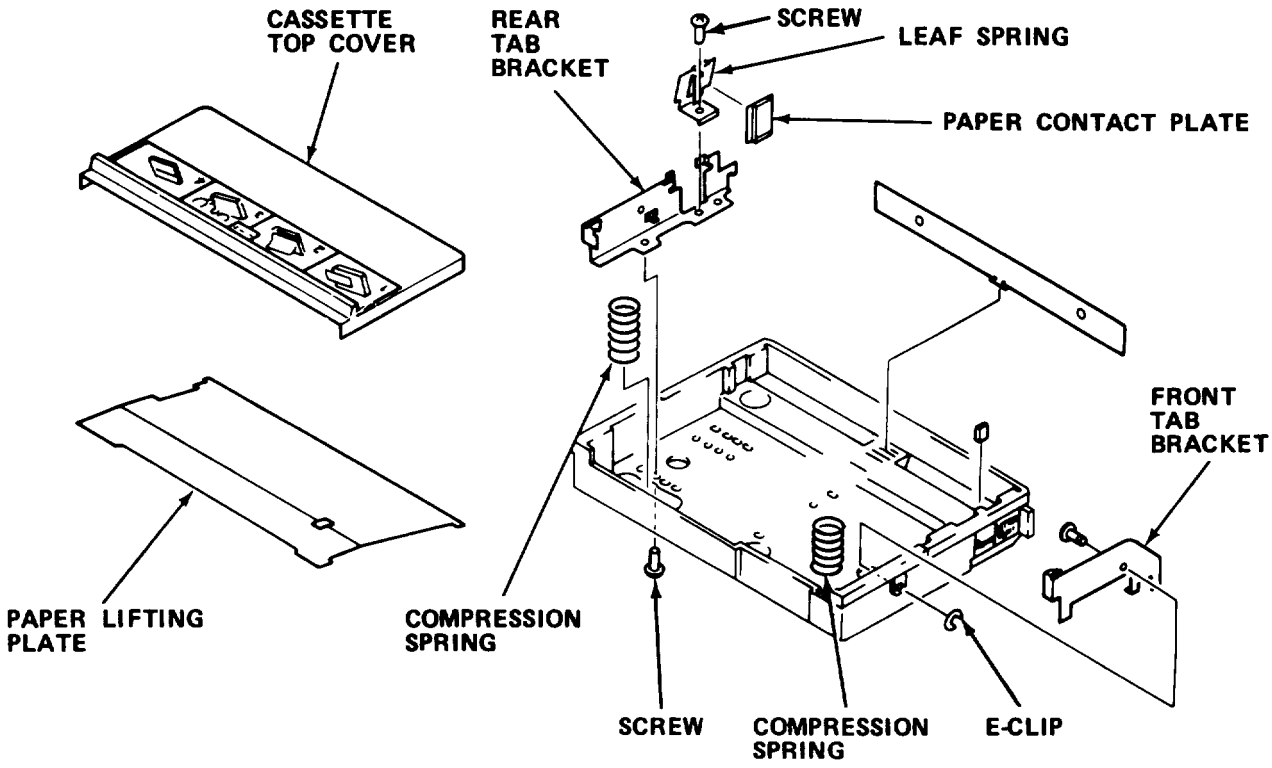
3-20.49 Replace Cassette Spring(s).

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver
Spring Gage (0-1500 grams)

SUPPLIES: Compression Spring

a. Remove cassette from copier.



b. Remove cassette top cover; then remove copy paper.

c. Remove screws from rear tab bracket then remove paper contact plate.

d. Remove E-clip from front tab bracket.

WARNING

Serious injury may occur when removing paper lifting plate to gain access to compression springs.

e. Remove paper lifting plate.

f. Remove spring.

g. Install new compression spring(s) and check for proper spring tension (letter size cassette 350 ± 40 grams).

h. Reinstall paper lifting plate.

i. Reinstall E-clip to front tab bracket.

j. Reinstall rear tab bracket and paper contact plate. Secure with screws.

k. Refill cassette with copy paper.

l. Reinstall cassette top cover.

m. Reinstall cassette into copier.

3-20.50 Replace Cleaner Blade.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Cross Tip Screwdriver
Flat Tip Screwdriver

SUPPLIES: Cleaner Blade

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

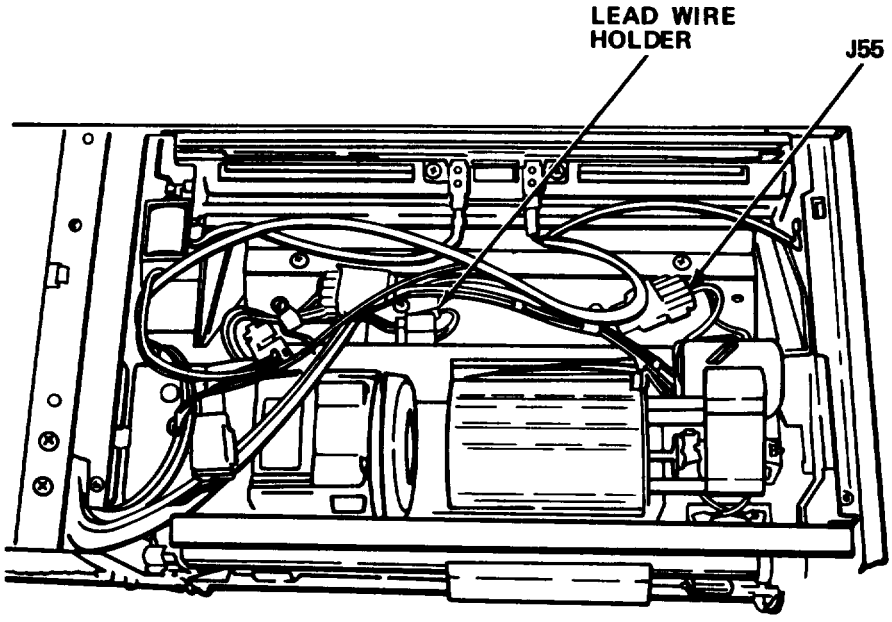
a. Turn power switch to O (OFF).

b. Unplug power cord.

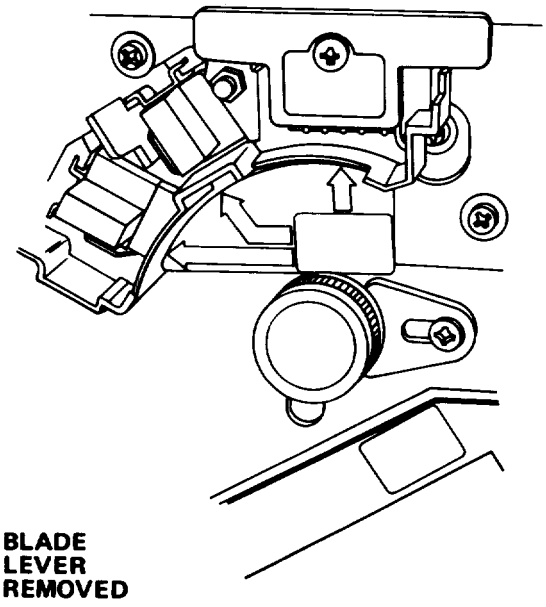
c. Open front door.

d. Shift platen to right.

e. Remove top left panel and ozone filter.



f. Remove lead wire holder and disconnect plug J55.

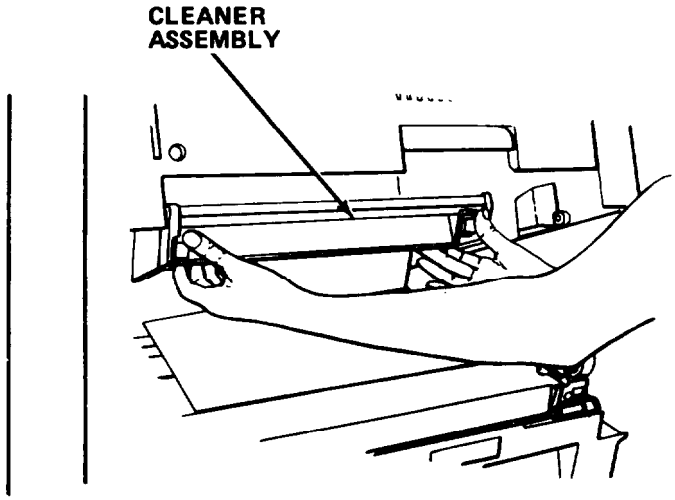


g. Lower blade lever to its resting position and remove screw and blade 1 ever.

h. Raise the upper assembly to full open position.

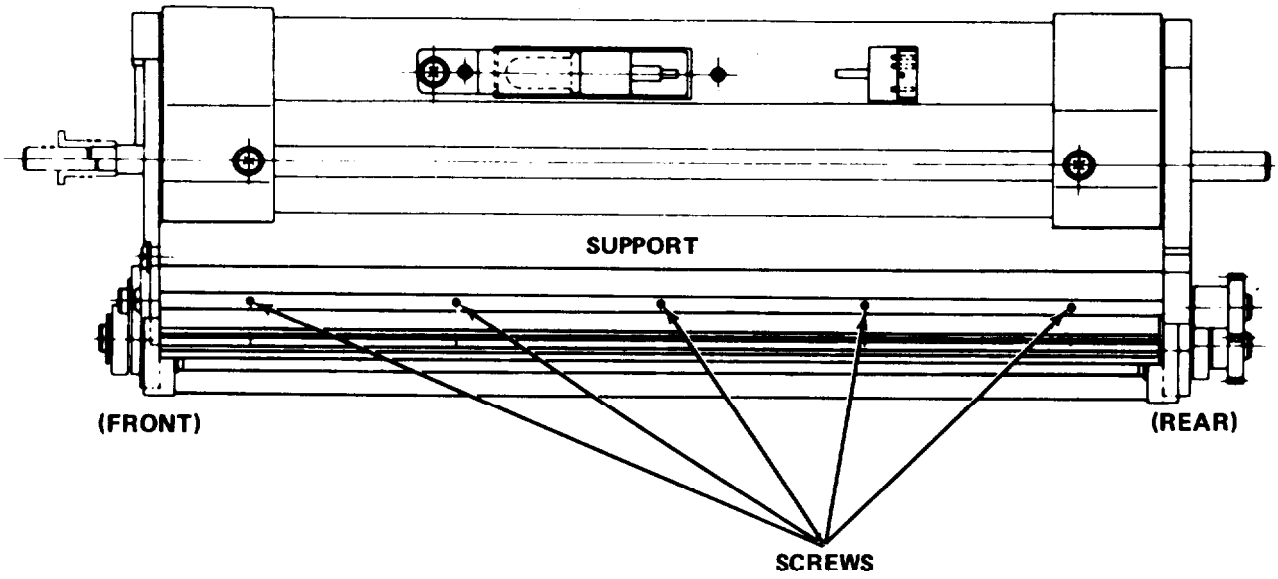
i. Place large copy paper over bottom of copier.

j. Remove waste developer receptacle, and remove and clean receptacle liner; then reinstall liner-and receptacle.



k. Hold cleaner assembly with both hands then lift and withdraw it from copier.

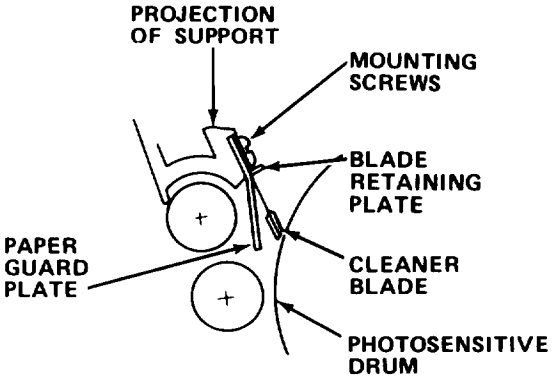
l. Remove rowel from bottom of cleaner assembly and retain. Place cleaner assembly on flat surface.

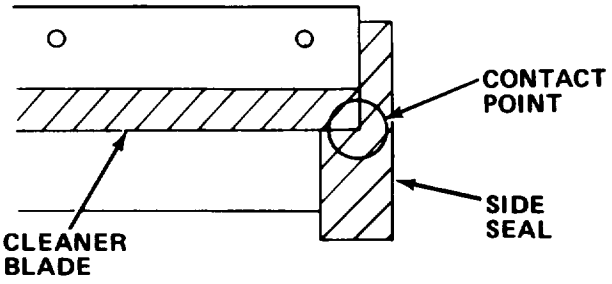


m. Remove screws and cleaner blade.

NOTE

If blade is excessively worn on one side, reverse it to use other side.





n. Replace cleaner blade and mounting screws.

NOTE

Be sure cleaner blade is flat and not wavy. Contact is correct if corner of blade contacts inner corner of seal.

o. Reinstall rowel.

p. Reinstall cleaner unit.

q. Reinstall waste developer receptacle.

r. Reconnect plug J55 and lead wire holder.

s. Reinstall ozone filter and top left panel.

t. Reinstall blade lever.

u. Remove copy paper.

v. Close and latch upper assembly and close front door.

w. Plug in power cord.

x. Turn power switch to 1 (ON).

3-20.51 Replace Cleaner Overflow Detector.

MOS: 35E, Special Electronic Devices Repairer

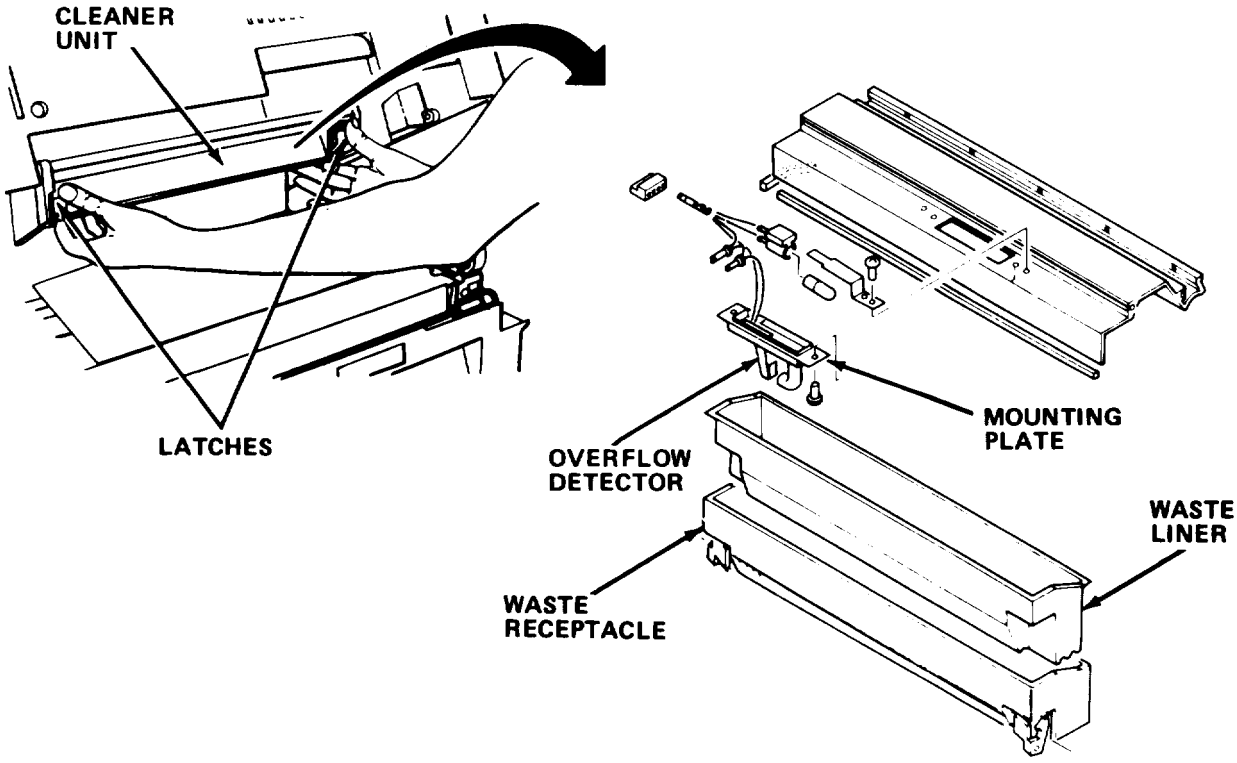
TOOLS: No. 2 Cross Tip Screwdriver
Diagonal Cutters
Soldering Iron
Heat Shrink Gun

SUPPLIES: Solder (Item 24, Appendix E)
Shrink Tubing
Overflow Detector

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Perform steps a thru l of paragraph 3-20.50.



b. Remove mounting plate and cleaner overflow detector.

c. Tag and disconnect wire from defective detector.

d. Install new detector, connect wires and remove tags.

e. Reinstall rowel.

f. Reinstall cleaner assembly.

g. Reinstall waste developer receptacle.

h. Remove paper from bottom of copier.

i. Reinstall blade lever, lift and place in groove in drum shaft.

j. Using both hands, gently lower and latch upper assembly.

k. Reconnect J55 and attach lead wire holder.

1. Reinstall ozone filter.

m. Reinstall top left cover.

n. Return platen to home position.

o. Close front door.

p. Plug in power cord.

q. Turn power switch to 1 (ON).

3-20.52 Replace Cleaner Overflow Bulb.

MOS: 35E, Special Electronic Devices Repairer

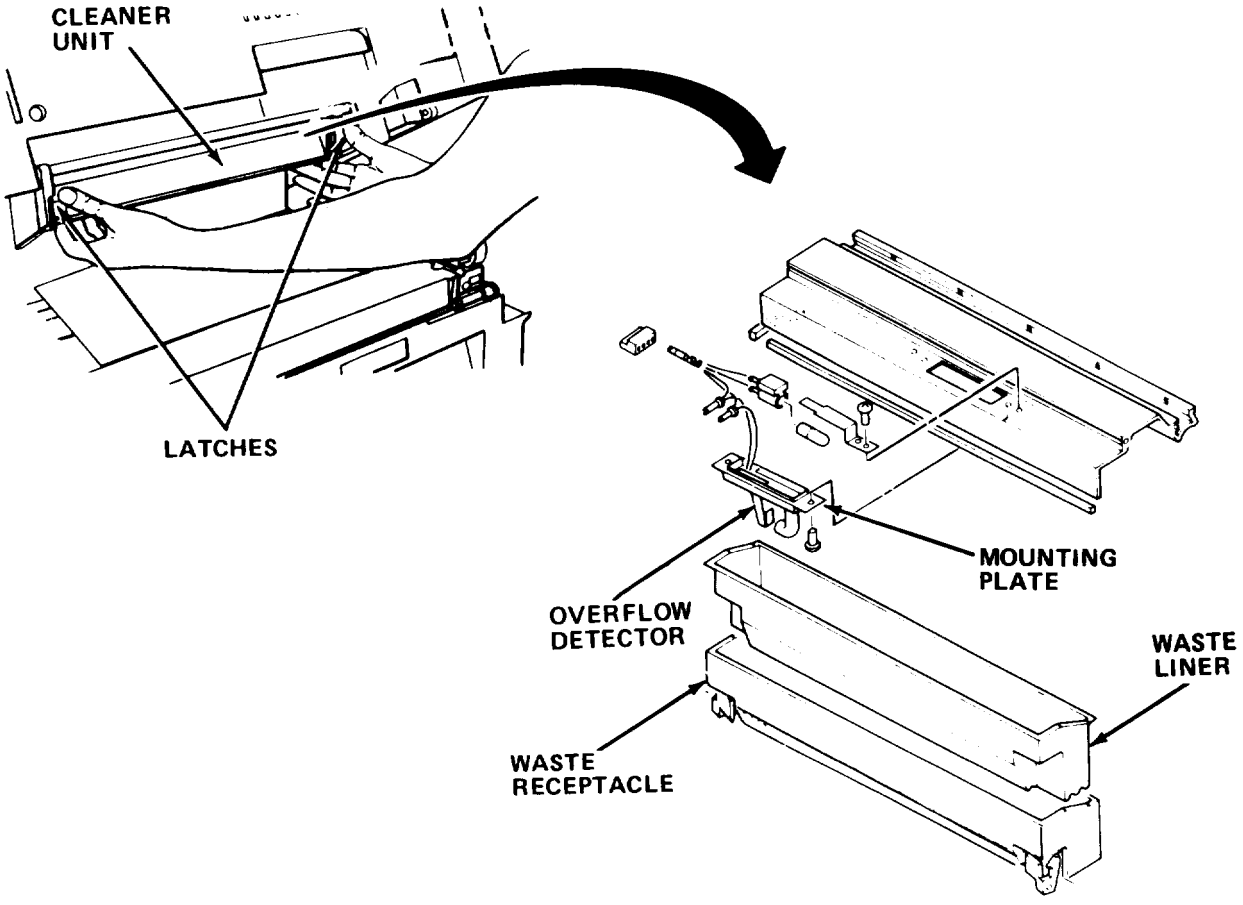
TOOLS: No. 2 Cross Tip Screwdriver (3 in.)

SUPPLIES: Bulb

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Perform steps a thru 1 of paragraph 3-20.50.



b. Remove mounting plate and old cleaner overflow bulb.

c. Install new cleaner overflow bulb.

d. Reinstall mounting plate.

e. Reinstall rowel.

f. Reinstall cleaner assembly.

g. Remove paper from bottom of copier.

h. Reinstall blade lever and lift in place in groove in shaft.

i. Using both hands, gently lower and latch upper assembly.

j. Reconnect J55 and lead wire holder.

k. Reinstall ozone filter.

l. Reinstall top left cover.

m. Return platen to home position.

n. Close front door.

o. Plug in power cord.

p. Turn power switch to 1 (ON).

3-20.53 Replace Cleaner Assembly Gears.

MOS: 35E, Special Electronic Devices Repairer

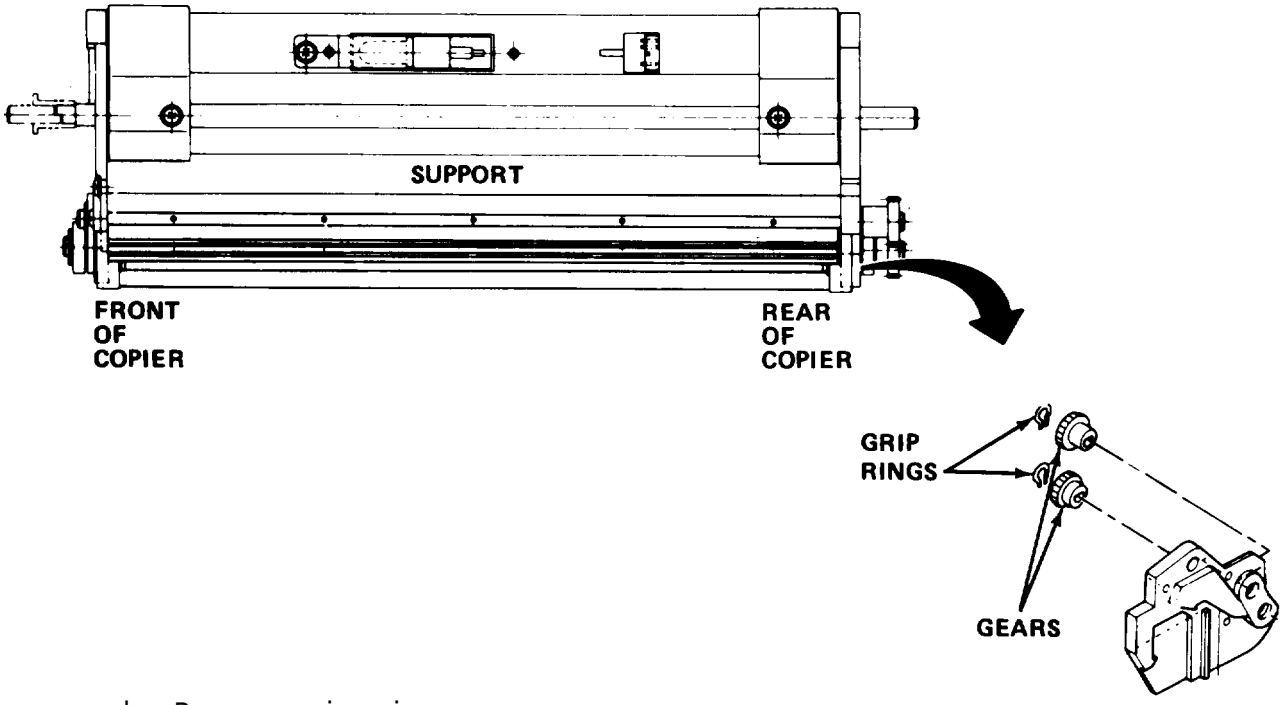
TOOLS : No. 2 Cross Tip Screwdriver
Grip Ring Pliers

SUPPLIES: Gears (2)

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Perform steps a thru l of paragraph 3-20.50.



b. Remove grip rings.

c. Remove gears.

d. Install new gears. Check that teeth mesh properly.

e. Reinstall grip rings.

f. Reinstall rowel.

g. Reinstall cleaner assembly.

h. Reinstall blade lever.

i. Reconnect plug J55 and lead wire holder.

j. Reinstall ozone filter and top left panel.

k. Remove copy paper.

l. Close upper assembly and front door.

m. Plug in power cord.

n. Turn power switch to 1 (ON).

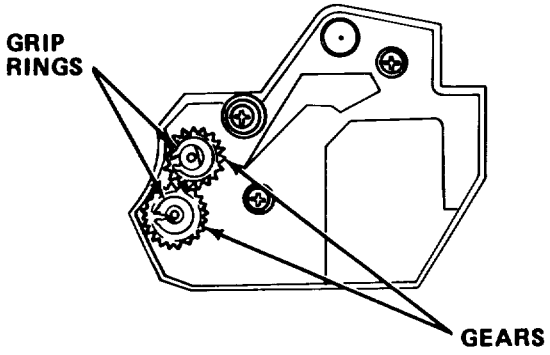
3-20.54 Replace Cleaner Assembly Seals.

MOS: 35E, Special Electronic Devices Repairer

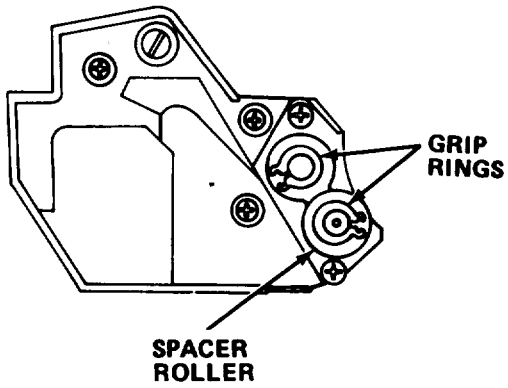
TOOLS: Cross Tip Screwdriver
Flat Tip Screwdriver
Grip Ring Pliers

SUPPLIES: Side Felt
Side Seals
Oil Seals
Foam Seals

a. Perform steps a through m (paragraph 3-20.50).



b. Remove two grip rings retaining cleaner gears; then remove the two gears, spacer rollers, and brass shim.



c. Remove two grip rings, brass shims, and spacer roller from the front side of the cleaner assembly.

d. Remove screws and roller cover, along with rollers from front side of cleaner assembly.

CAUTION

To avoid damage to side seals, packing, or side felt, use care when inserting screwdriver blade to remove roller cover.

e. Push a small flat tip screwdriver between the roller cover and the cleaner front side panel and pry the roller cover off, little by little.

NOTE

Be sure that plastic and metal spacers on roller shafts are installed correctly.

f. Install oil seals, side felt, and foam seals.

g. Reinstall rollers and roller cover on front side of cleaner assembly.

h. Reinstall brass shims, spacer roller, and grip rings on front side of cleaner assembly:

i. Reinstall brass shim, spacer roller, and gears on roller shafts on rear side of cleaner assembly.

j. Reinstall cleaner blade.

k. Replace side seals.

l. Reinstall rowel.

m. Reinstall cleaner assembly and remove paper.

n. Close upper assembly.

o. Reconnect plug J55 and reinstall lead wire holder.

p. Reinstall ozone filter and top left panel.

q. Reinstall blade lever and reposition in groove in drum shaft.

r. Close front door.

s. Plug in power cord.

t. Turn power switch to 1 (ON).

3-20.55 Replace Separation Claw(s)/Spring(s).

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver

SUPPLIES: Separation Claw(s)
Spring(s)
Lens Tissue (Item 30, Appendix E)

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

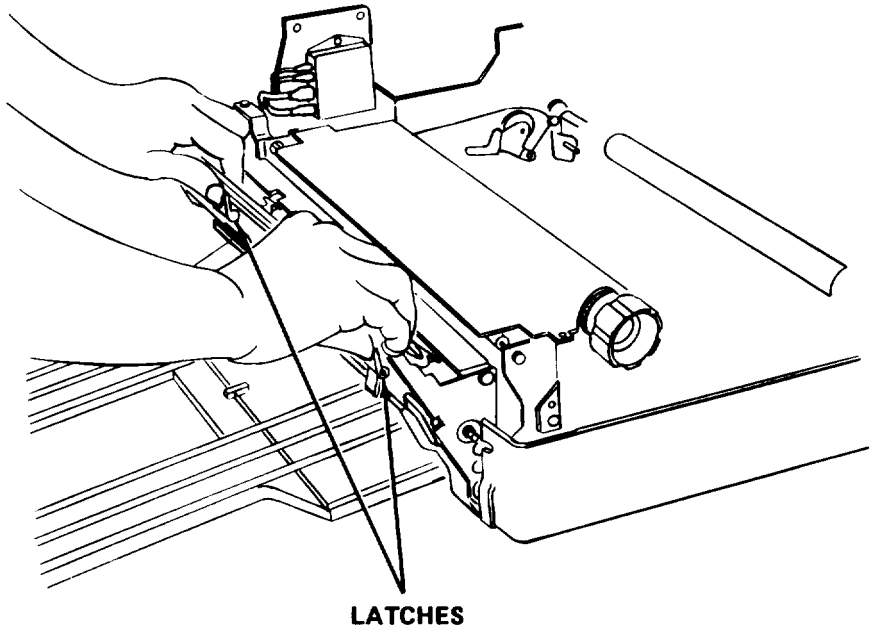
a. Place power switch to O (OFF).

b. Unplug power cord.

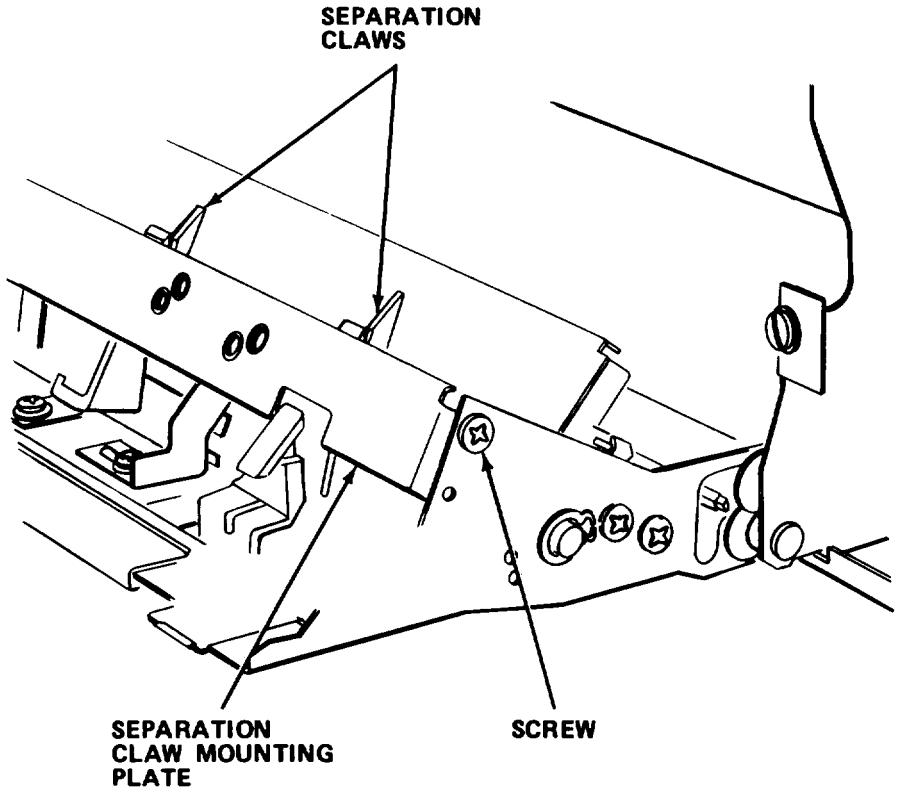
c. Slide platen to right.

d. Grasp handles and raise upper assembly to open position.

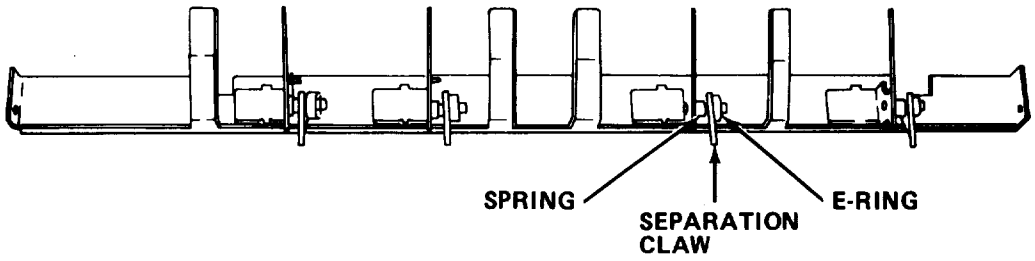
e. Remove lower left panel and paper tray.



f. Press two latches and lower discharge section.



g. Remove screws at both ends and remove mounting plate.



h. Remove E-ring from separation claw(s) and remove separation claw(s) and spring(s).

i. Install new separation claw(s)/spring(s) and secure with E-ring.

j. Reinstall mounting plate and secure with screws.

k. Wipe each claw with lens cleaning tissue.

l. Raise and latch lower discharge section.

m. Reinstall lower left panel and paper tray.

n. Lower and latch upper assembly.

o. Plug in power cord.

p. Turn power switch to 1 (ON).

3-20.56 Replace Separation Belt Roller.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver
No. 2 Cross Tip Screwdriver, 2 in.
Flat Tip Screwdriver
Grip Ring Pliers

SUPPLIES: Roller

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Place power switch to O (OFF).

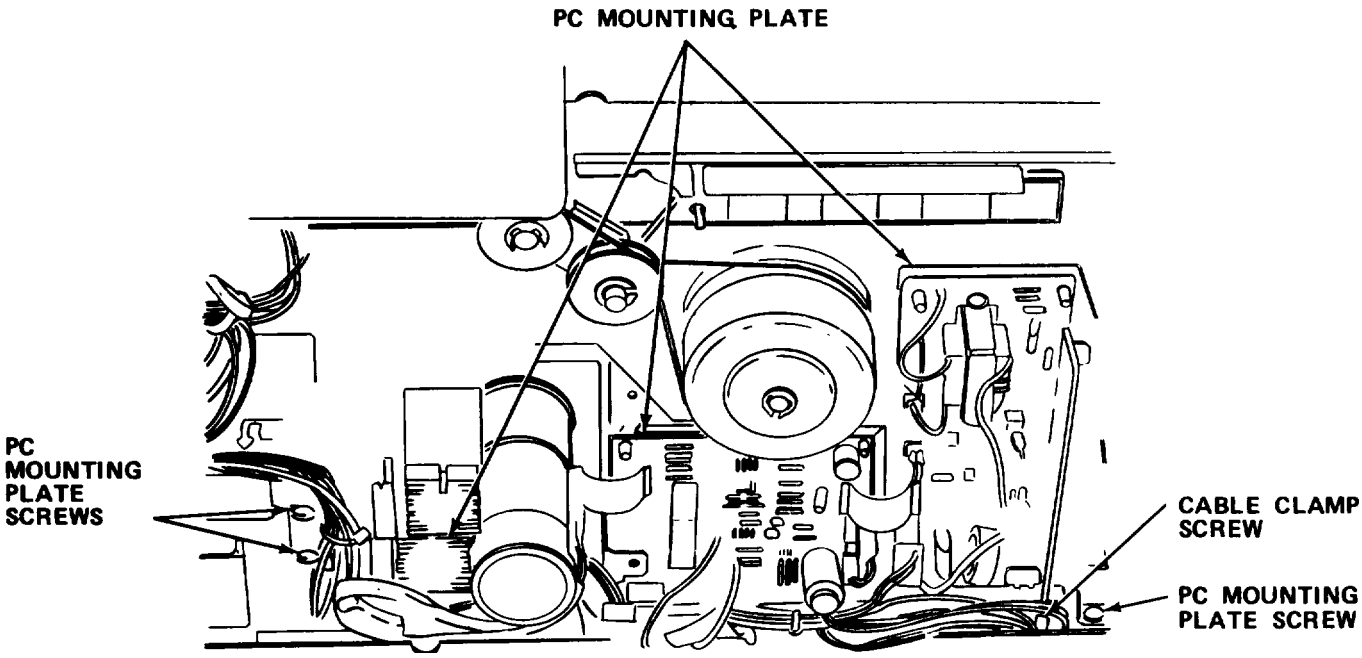
b. Unplug power cord.

c. Remove upper and lower rear panels and lower front panel.

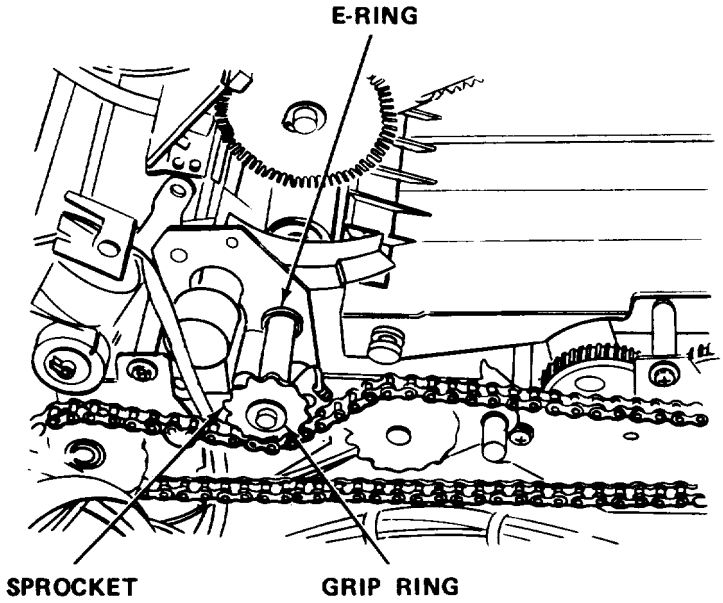
d. Slide platen to right.

e. Grasp handle and raise upper assembly to full open position.

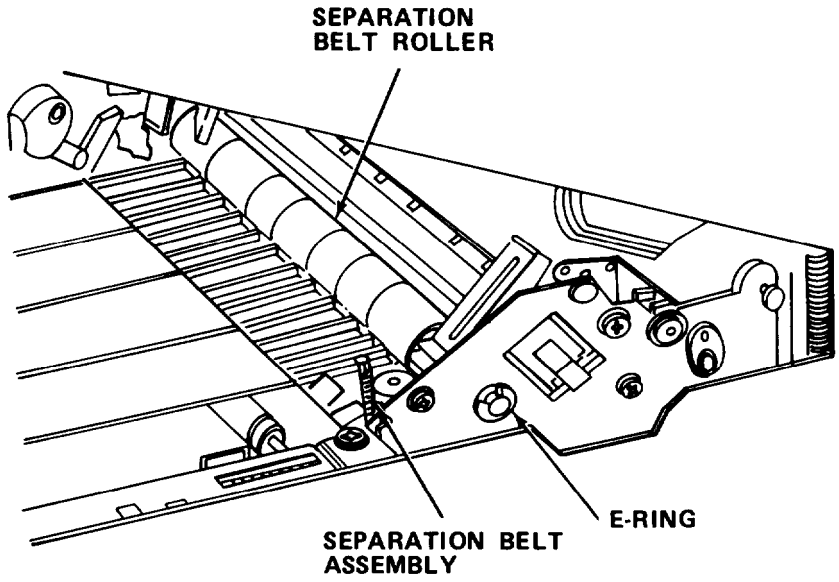
f. Remove PC board panel.



g. Remove PC mounting plate screws and cable clamp screws; then lay mounting plate on its side.



h. Remove grip ring, sprocket, and E-ring.



i. Remove separation belt assembly and E-ring.

j. Push shaft inward until it clears side plate; then remove it along with the roller.

k. Remove defective roller(s) from the shaft.

l. Install new roller(s) on the shaft.

m. Reinstall shaft.

n. Reinstall separation belt assembly and E-ring.

o. Reinstall E-ring, sprocket, and grip ring.

p. Reinstall PC panel.

q. Lower and latch upper assembly and return platen to home position.

r. Reinstall upper and lower rear panels and lower front panel.

s. Plug in power cord.

t. Turn power switch to 1 (ON).

3-20.57 Replace Separation Belt Assembly

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 2 Cross Tip Screwdriver

SUPPLIES: Separation Belt Assembly

WARNING

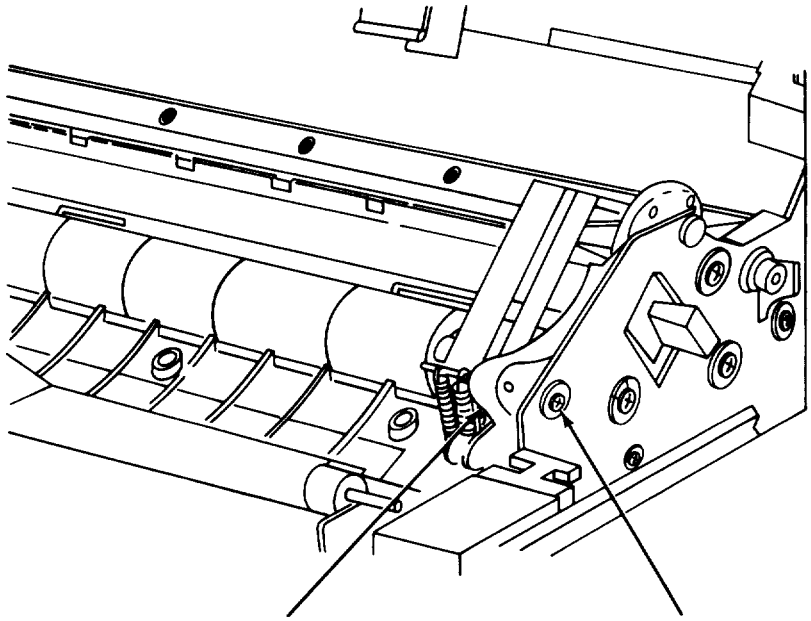
Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Place power switch to O (OFF).

b. Unplug power cord.

c. Slide platen to right.

d. Grasp handle and raise upper assembly to full open position.



e. Remove screw and separation belt assembly.

f. Install new separation belt assembly.

g. Lower and latch upper assembly.

h. Return platen to home position.

i. Plug in power cord.

j. Turn power switch to 1 (ON).

3-20.58 Replace Thermal Fuse.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Cross Tip Screwdriver

SUPPLIES: Thermal Fuse

WARNING

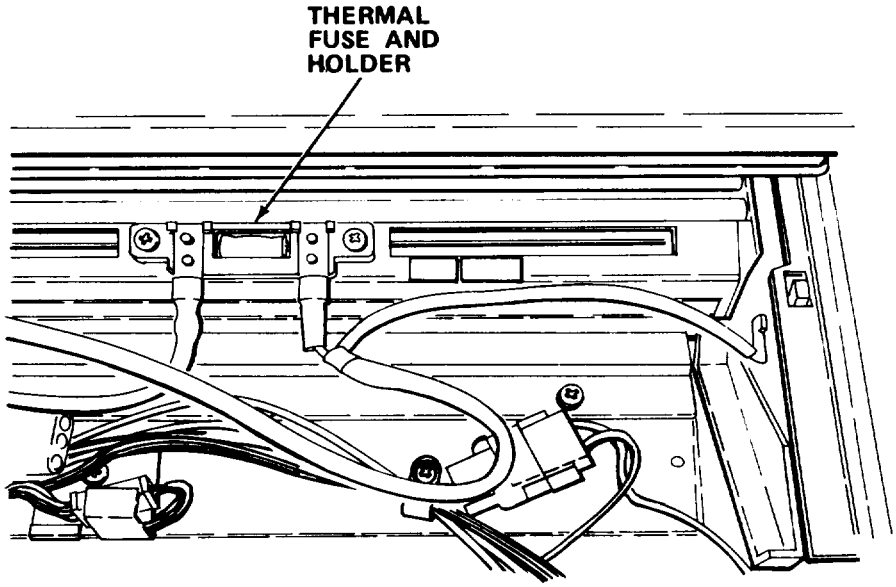
Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Turn power switch O (OFF).

b. Unplug power cord.

c. Slide platen to right.

d. Remove top left panel.



e. Remove fuse holder.

f. Remove defective fuse.

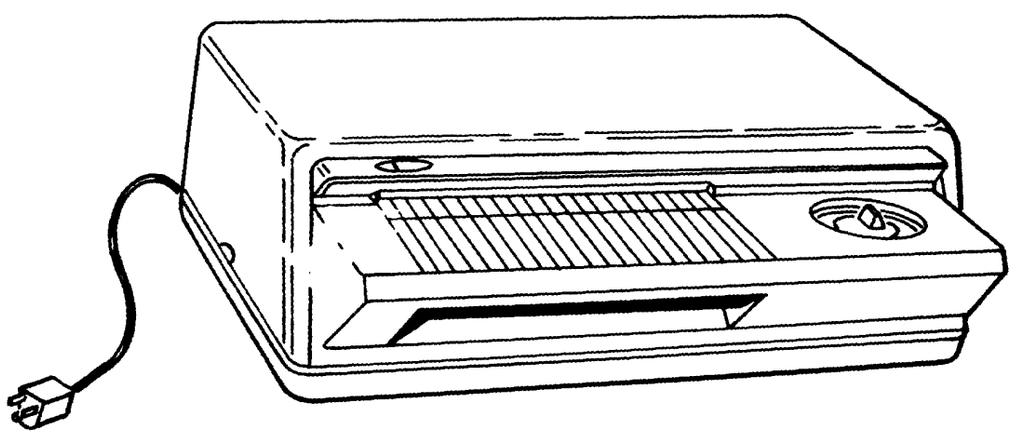
g. Install new fuse and fuse holder.

h. Reinstall top left panel.

i. Return platen to home position.

j. Plug in power cord.

k. Turn power switch to 1 (ON).



CHAPTER 4

THERMOGRAPHIC COPY MACHINE

Section I INTRODUCTION

4-1. GENERAL INFORMATION.

4-1.1 Scope.

a. Model Number and Equipment Name. Model 45 Thermographic Copy Machine.

b. Purpose of Equipment. To produce transparencies or copies.

4-2. EQUIPMENT DESCRIPTION.

4-2.1 Equipment Characteristics. Capabilities, and Features.

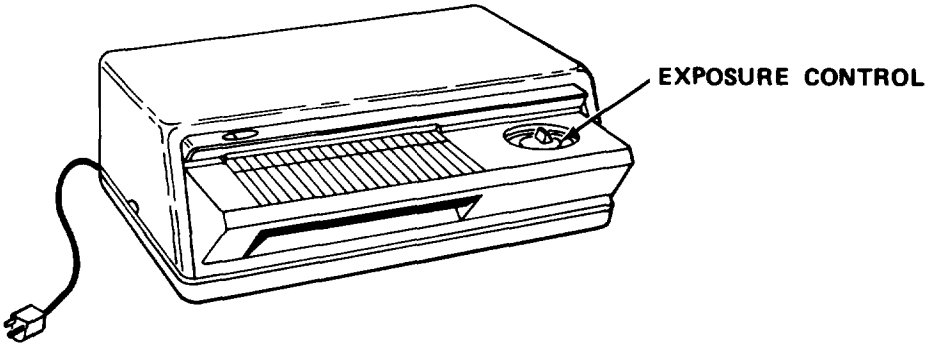
a. Variable exposure control with color-coded dial.

b. Thermally compensated exposure system.

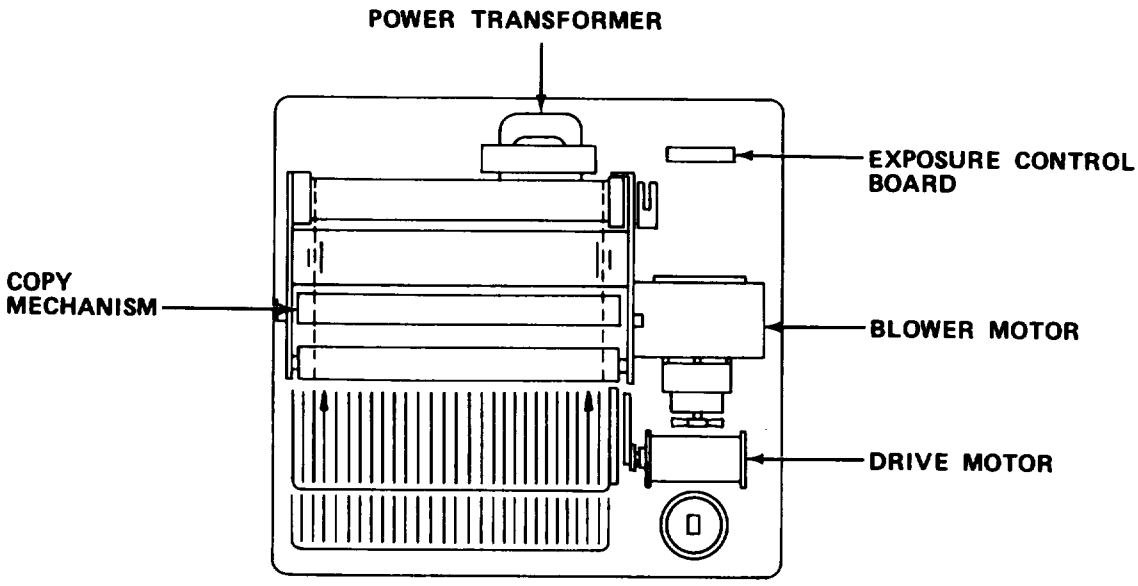
c. Overheat protection thermostats.

d. Automatic on/off switch.

4-2.2 Location and Description of Major Components.



EXPOSURE CONTROL. Adjusts to lighten or darken transparency or copy.



POWER TRANSFORMER. Changes 120 V, 50/60 Hz input to required operating voltages.

EXPOSURE CONTROL BOARD. Controls speed of copy drive motor.

BLOWER MOTOR. Cools lamp and reflector assembly.

DRIVE MOTOR. Variable-speed motor drives copy mechanism.

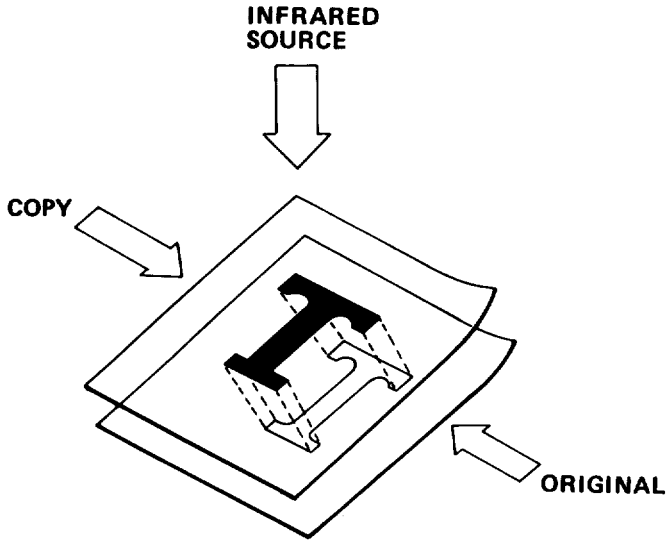
COPY MECHANISM. Consists of lamp, reflector, rollers, and copy belt assembly. Transports copy materials through copy machine.

4-2.3 Equipment Data.

Overall Dimensions	19-1/2 X 15-1/2 X 7-7/8 in. (49.5 X 39.4 X 20 cm)
Weight	35 lbs (16 kg)
Power Requirements	120 V, 50/60 Hz, 7.5 amps
Illumination	1350 watts
Production Rate	4 Transparencies/minute

4-3. TECHNICAL PRINCIPLES OF OPERATION.

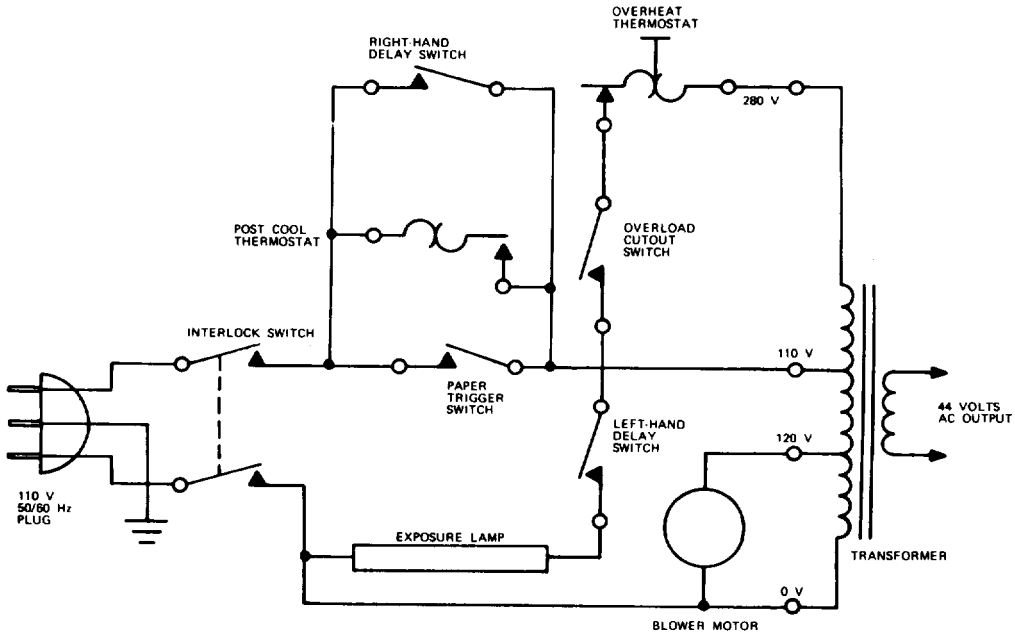
4-3.1 General.

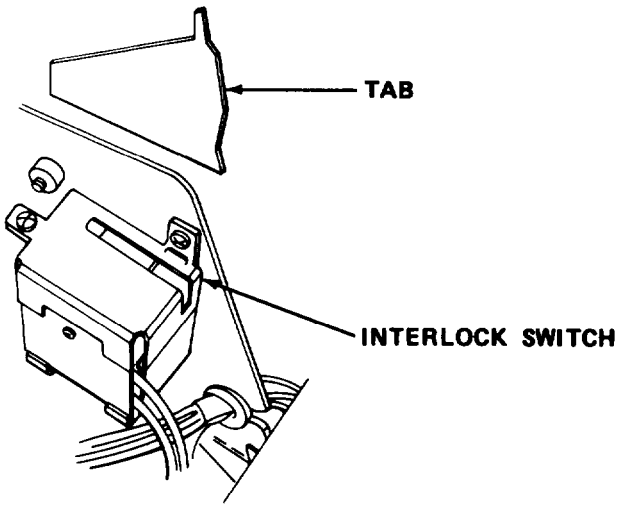


The copy material, either transparency or paper, is placed on top of the original. When this composite is exposed to the infrared source, the image of the original is thermographically made on the copy material.

4-3.2 Detailed.

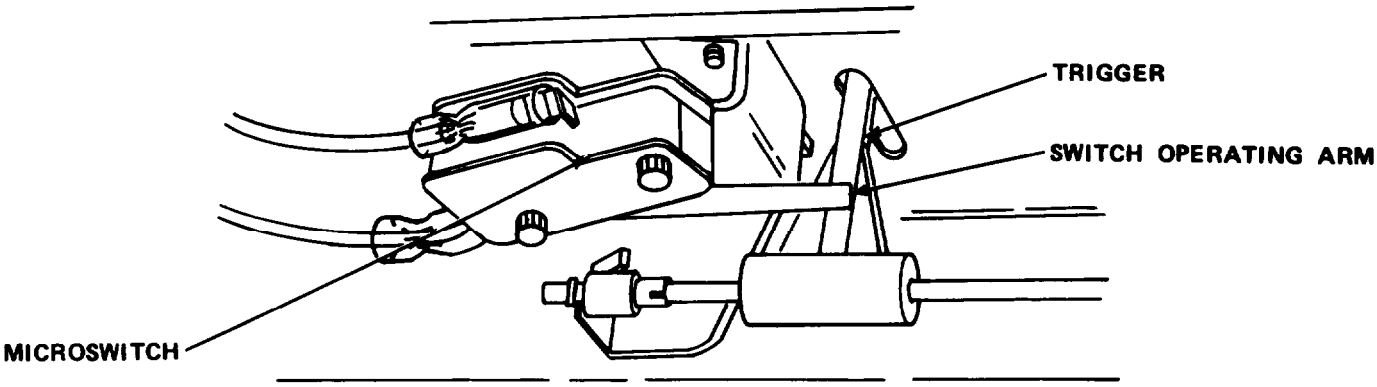
a. Electromechanical System.



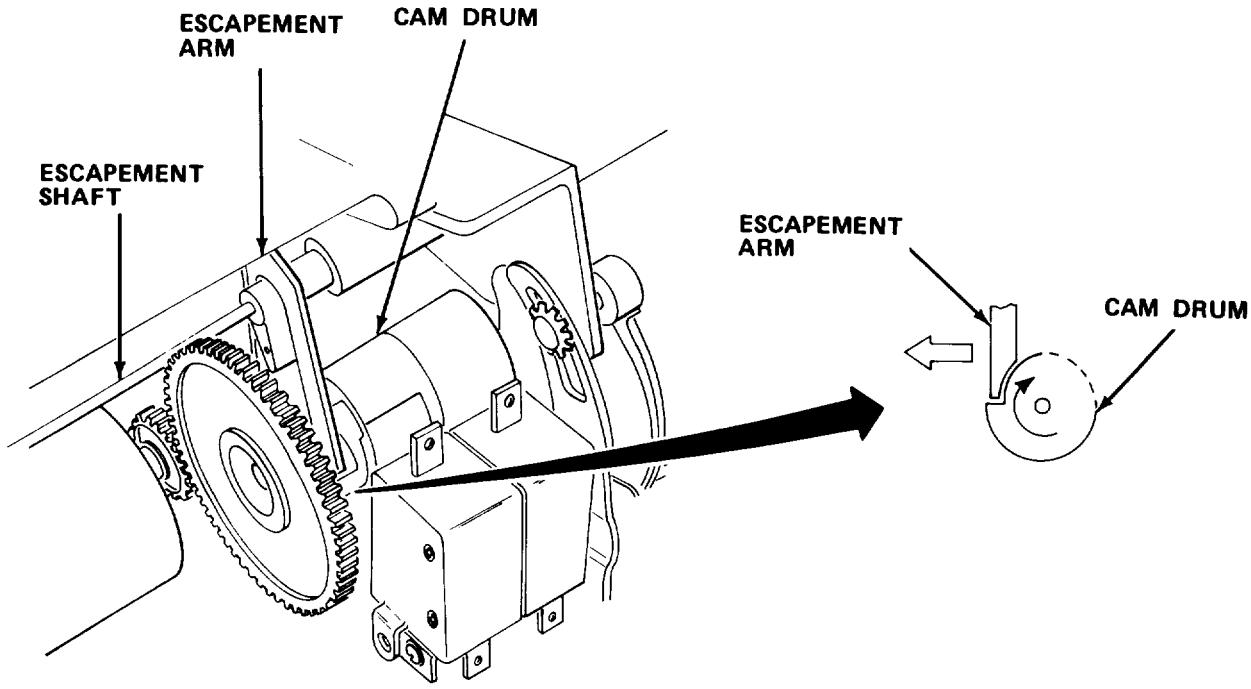


(1) Power is applied via the power cord to the interlock switch.

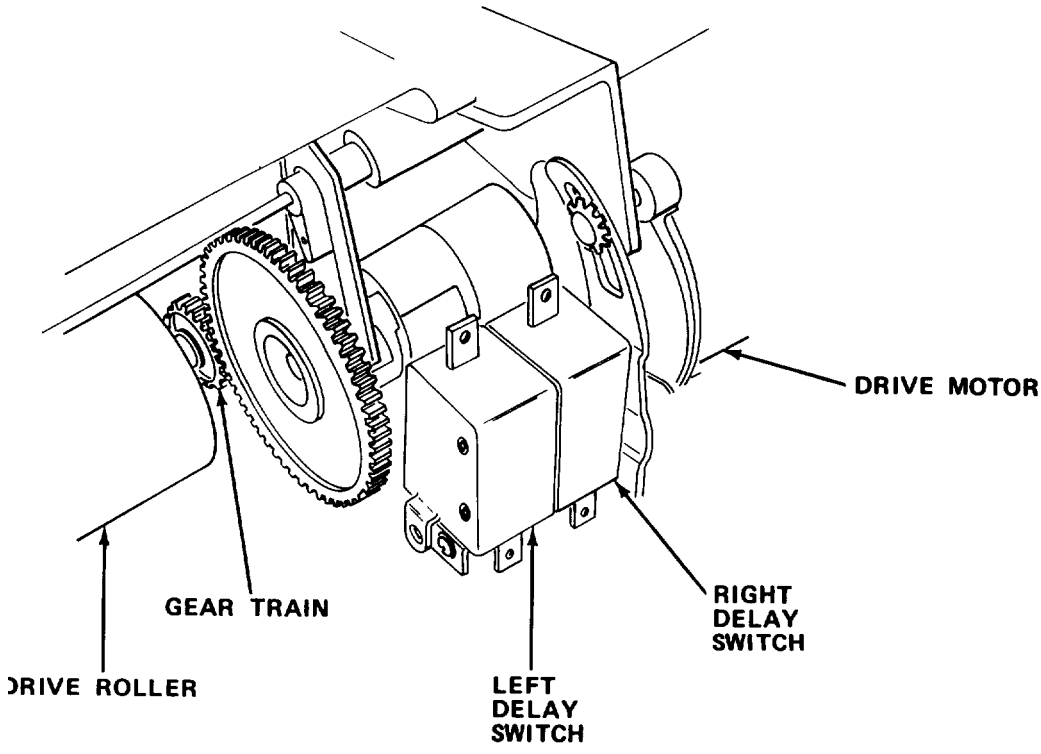
(2) The interlock switch is actuated by the tab which is part of the copy machine's hinged top cover. Lifting the cover removes all power from the copy machine. When this switch is closed, power is passed to the rest of the copy machine via the paper trigger switch.



(3) The paper trigger switch is a lever-operated microswitch actuated by the trigger when copy materials are placed into the upper paper slot. This allows the switch operating arm to move forward under spring pressure, closing the switch. This applies power to the power transformer, blower motor, and drive motor.



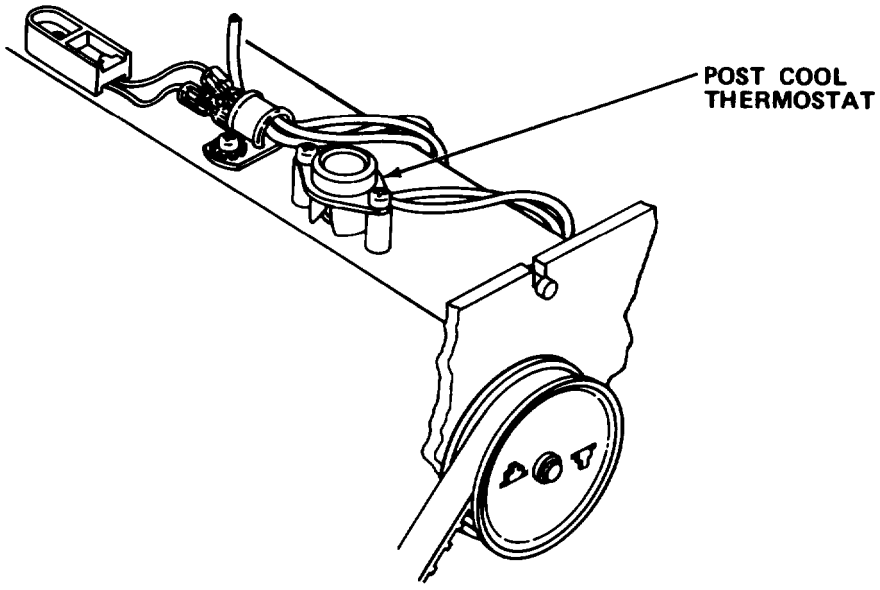
(4) The action of the paper trigger switch also rotates the escapement shaft, lifts the escapement arm, and allows the cam drum to start its rotation. Once the rotation has started, it will continue until the cycle is complete.



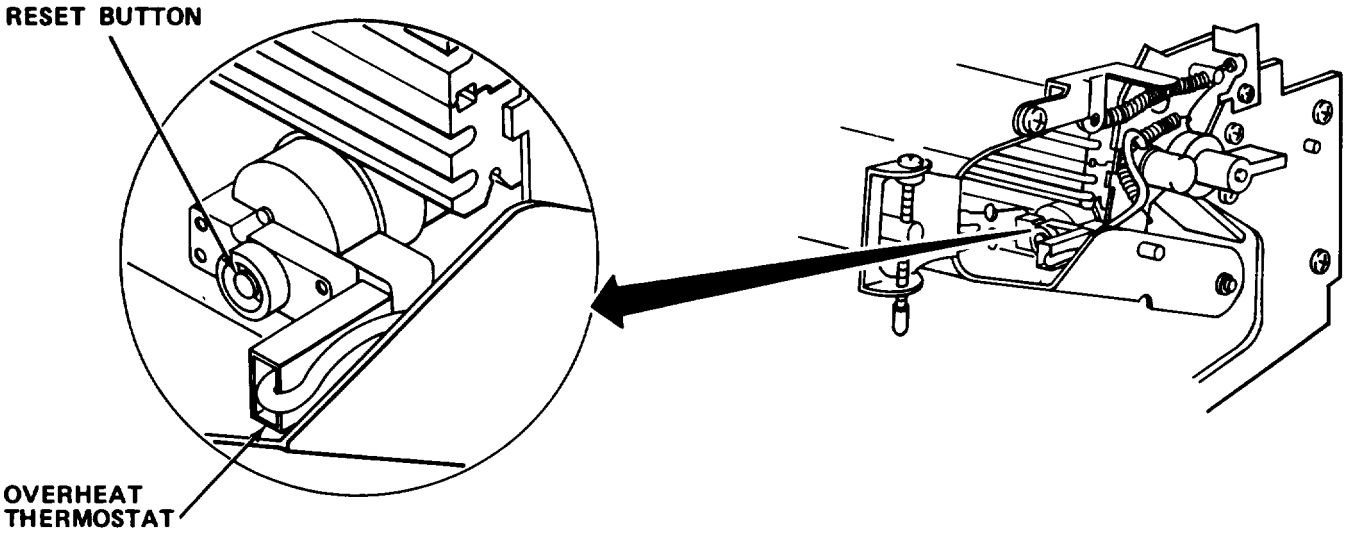
(5) The cam assembly is driven from the drive motor via the gear train which also powers the drive roller. As the cam rotates, it actuates the left and right delay switches. The right delay switch controls power to the whole copy machine, even if the paper trigger switch is opened. The left delay switch applies 280 V to the exposure lamp.

(6) The cam assembly is geared to the main drive roller. This ensures that the drive motor, exposure lamp, and cam assembly remain synchronized in their operation.

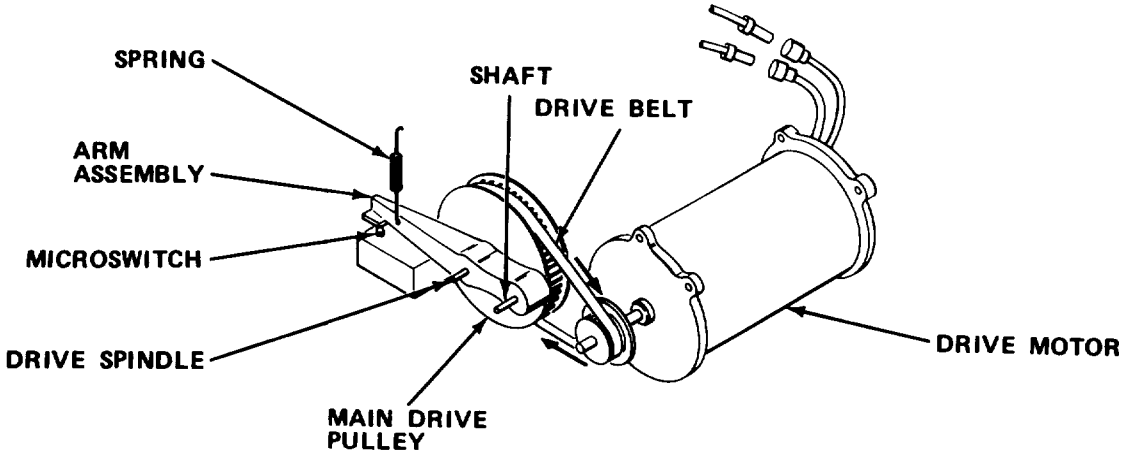
(7) At the completion of the cycle, the delay switches are opened and the exposure lamp goes out, but power is still applied to the power transformer and blower motor by the post cool thermostat.



(8) The post cool thermostat is located underneath the top front roller and is actuated by the heat output of the exposure lamp. At the end of the copy cycle, the post cool thermostat remains closed and maintains the circuit supplying power to the drive motor and blower motor. Both motors continue to operate until the temperature drops to a point where the post cool thermostat opens, removing power from the copy machine.



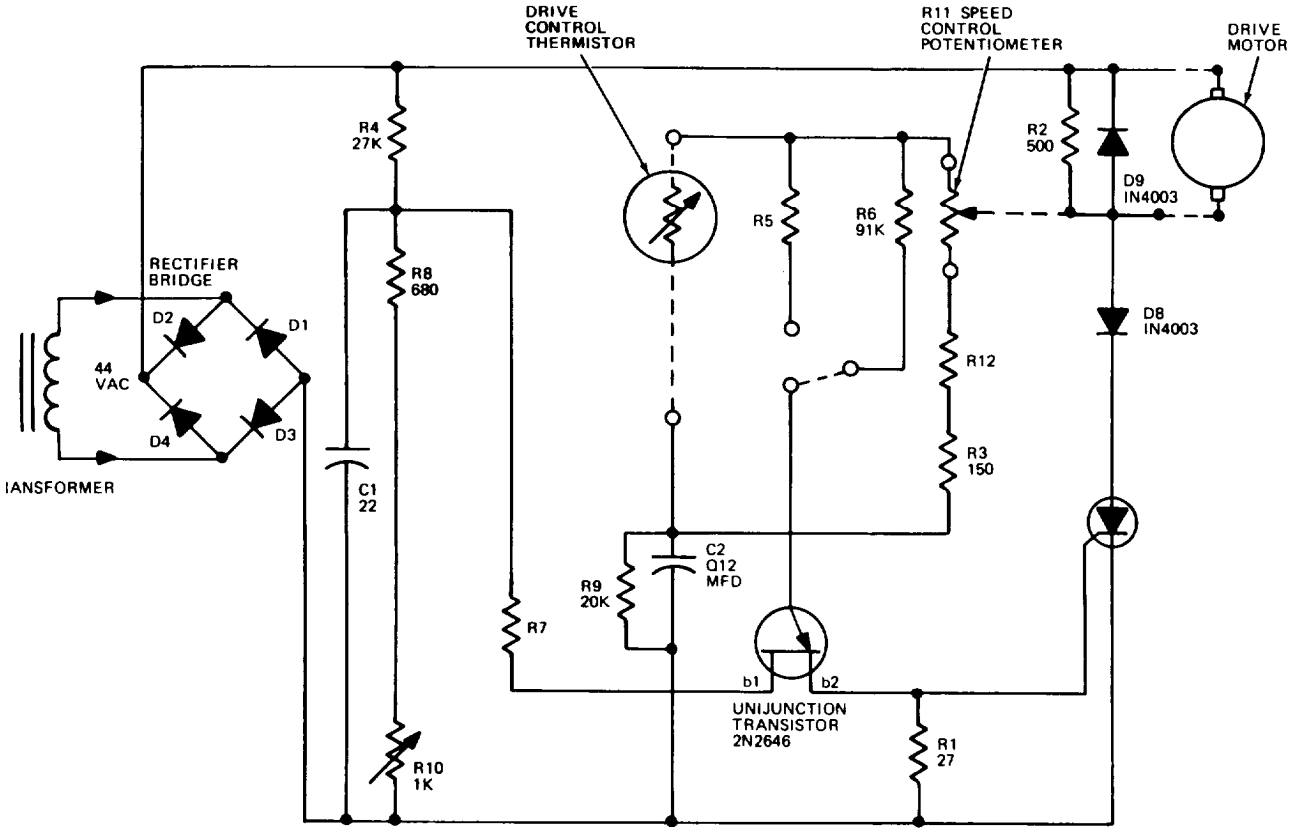
(9) A resettable overheat thermostat is fitted underneath the lamp reflector on the left of the copy machine. This thermostat senses the heat output of the lamp assembly and, in an overheat condition, opens, cutting power to the exposure lamp. This thermostat may be reset by pushing the reset button.



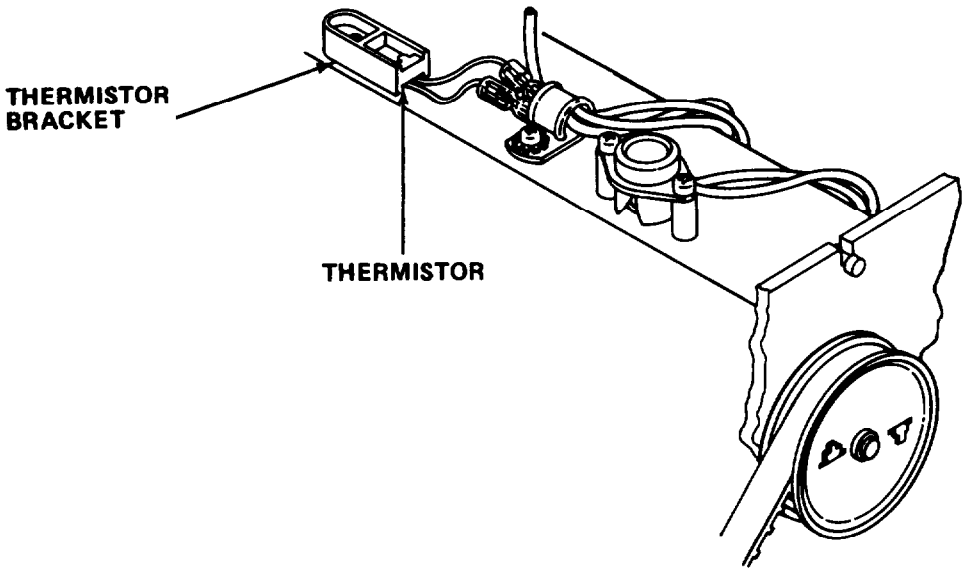
(10) The overload or jam switch is mounted in conjunction with the drive motor assembly at the front right of the copy machine. Power is transmitted to the main drive pulley by the rubber drive belt. The gear drive spindle then drives the rest of the paper transport system. This spindle is carried by the arm assembly which pivots on the shaft.

(11) In the event that the drive rollers or copy belt jams, the additional load applied to the lower side of the belt drive pulls the arm assembly downward against the spring, actuating the microswitch. When the microswitch is closed, it cuts power to the exposure lamp. However, the drive motor will continue to have power if either the right delay switch or the post cool thermostat are still closed.

b. Drive Motor Speed Control Circuit.



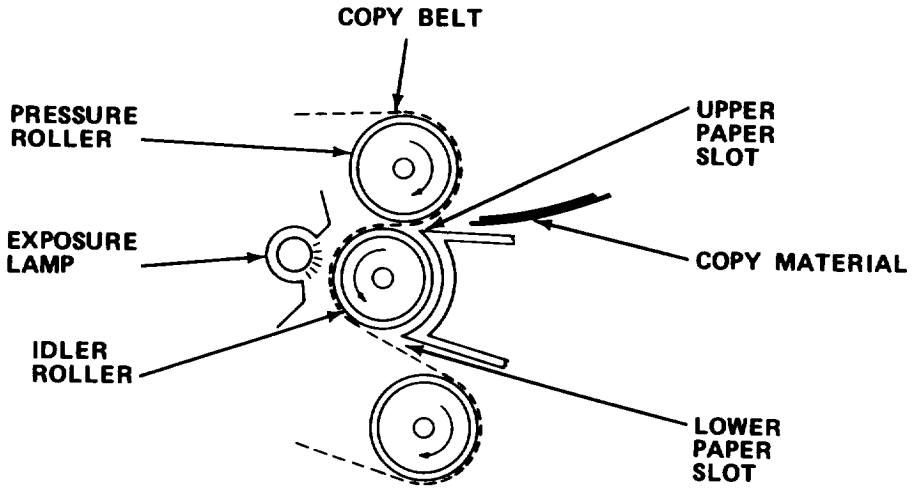
(1) The 44 V ac output of the power transformer is fed to the bridge rectifier-which consists of' diodes D1 thru D4. The 44 V dc output of the rectifier is filtered by Cl and powers the drive motor via the speed control circuit. R4, R7, R8, and variable resistor R10 work as a voltage divider network which sets the operating point of the unijunction transistor. Fixed resistors R2, R3, and R6, variable resistor R12, the speed control potentiometer R11, and the thermistor form a time constant circuit with capacitor C2, which controls the pulse output of the unijunction transistor. The variable resistor R12 is mounted on the printed circuit board and is used during calibration to set up the initial motor speed. The speed control potentiometer is adjusted by the exposure control knob and provides fine control over the motor speed.



(2) The thermistor is located underneath the 1 amp and reflector assembly where it senses heat output of the exposure lamp. Any change in the heat output of the exposure lamp causes a resistance change in the thermistor which alters the drive motor speed proportionally to the lamp output.

(3) The unijunction transistor produces positive going pulses under the control of the time constant, speed control potentiometer, and the thermistor. The pulses are fed to the gate of the silicone-controlled rectifier (SCR), resistor R1, and sets the gate operating level. The SCR is gated as determined by the speed control circuit, and being in series with the drive motor, varies the power supplied to it. Diodes D8 and D9 are blocking diodes and prevent reverse voltages from reaching the SCR.

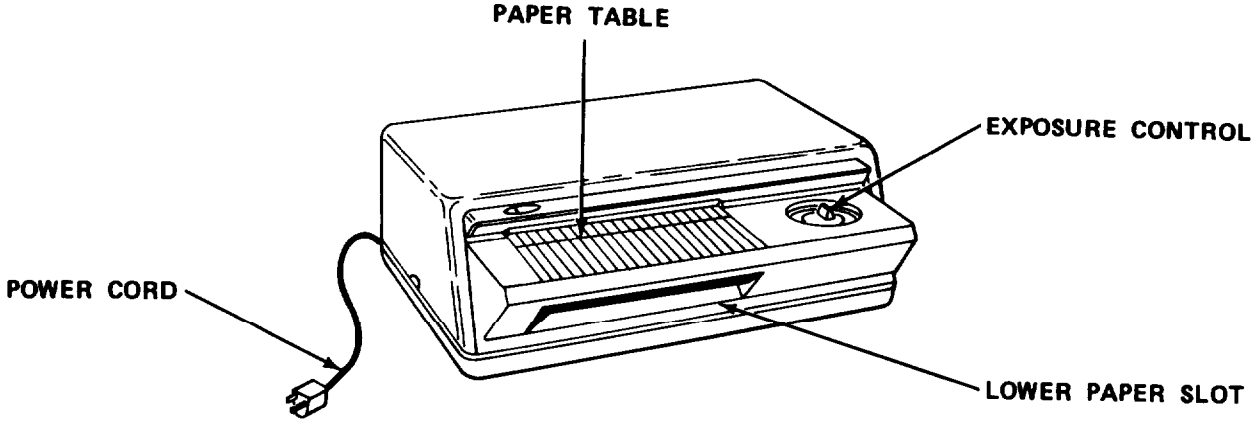
c. Paper Transport System.



(1) The original and copy material are fed into the upper paper slot where they are picked Up between the copy belt and pressure roller. The composite is then carried around the idler roller and in front of the exposure lamp. The original and completed copy then exit the copy machine via the lower paper slot at the front of the machine.

Section 11 OPERATING INSTRUCTIONS

4-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.



Control or Indicator	Function
Exposure Control	Adjusts to lighten or darken transparency or copy .
Paper Table	Original and copy material are placed on this table and fed into the copy machine.
Lower Paper Slot	Original and completed copy emerge from this slot.
Power Cord	Connects with 120 V, 50/60 Hz grounded source.

4-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

Before You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your before (B) PMCS.

b. While You Operate. Always keep in mind the WARNINGS and CAUTIONS. Perform your during (D) PMCS.

c. After You Operate. Be sure to perform your after (A) PMCS.

d. If Your Equipment Fails to Operate. Troubleshoot with the proper equipment. Report any deficiencies using the proper forms. See DA Pam 738-750.

4-5.1 PMCS Procedures.

PMCS are designed to keep the equipment in good working condition by performing periodic service tasks.

b. Service Intervals provide you, the operator, with time schedules that determine when to perform specified service tasks.

c. The “Equipment is Not Ready/Available If” column is used for identification of conditions that make the equipment not ready/available for readiness reporting purposes or denies use of the equipment until corrective maintenance is performed.

d. If your equipment fails to operate after PMCS is performed, immediately report this condition to your supervisor.

e. Perform weekly as well as before operations if you are the assigned operator and have not operated the item since the last weekly or if you are operating the item for the first time.

f. Item number column, Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your “TM Number” column on DA Form 2404, Equipment Inspection and Maintenance Worksheet in recording results of PMCS.

g. Interval column. This column determines the time period designated to perform your PMCS.

h. Item to be inspected column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation Chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.

i. Equipment is Not Ready/Available If: column. This column indicates the reason or cause why your equipment is not ready/available to perform its primary mission.

j. List of tools and materials required for PMCS is as follows:

Item	Quantity
Belt Cleaner (Item 6, Appendix E)	ar
Liquid Detergent (Item 9, Appendix E)	ar
Cheesecloth (Item 7, Appendix E)	ar
Denatured Alcohol (Item 4, Appendix E)	ar
Duct Sealing Cloth Tape (Item 29, Appendix E)	ar

Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can safely be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		THERMOGRAPHIC COPY MACHINE	
1	W	Inspect Copy Machine. **WARNING** Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing copy machine. 1. Unplug power cord. 2. Visually inspect power cord for kinks, frayed or broken wires, torn or discolored covering, or cracked plug. 3. Inspect unit for loose or missing parts.	Wires are frayed or broken, plug prongs are bent, or parts are loose or missing.

Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before W - Weekly AN - Annually (Number) - Hundreds of Hours
D - During M - Monthly S - Semiannually
A - After Q - Quarterly BI - Biennially

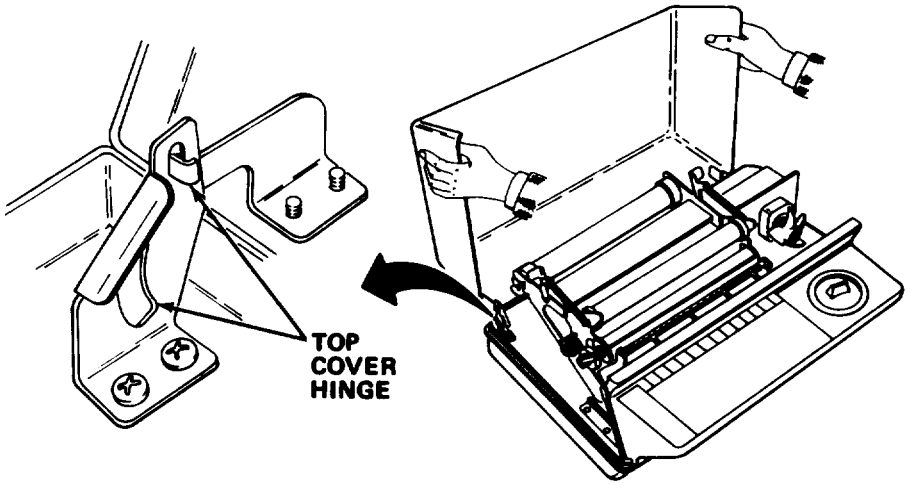
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		THERMOGRAPHIC COPY MACHINE - Cont	
1	W	Inspect Copy Machine - Cont	
			
		4. Open top cover.	
		5. Examine belt and rollers for paper scraps caught in mechanism.	
		6. Remove paper scraps if required.	
		7. Close cover.	
		8. Plug in power cord.	
2	W	Clean Exterior Surfaces.	
		1. Unplug power cord.	
		2. Clean exterior surfaces with cheesecloth slightly moistened with water and detergent.	
		3. Plug in power cord.	

Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		THERMOGRAPHIC COPY MACHINE - Cont	
3	W	Clean Belt and Print Roller.	

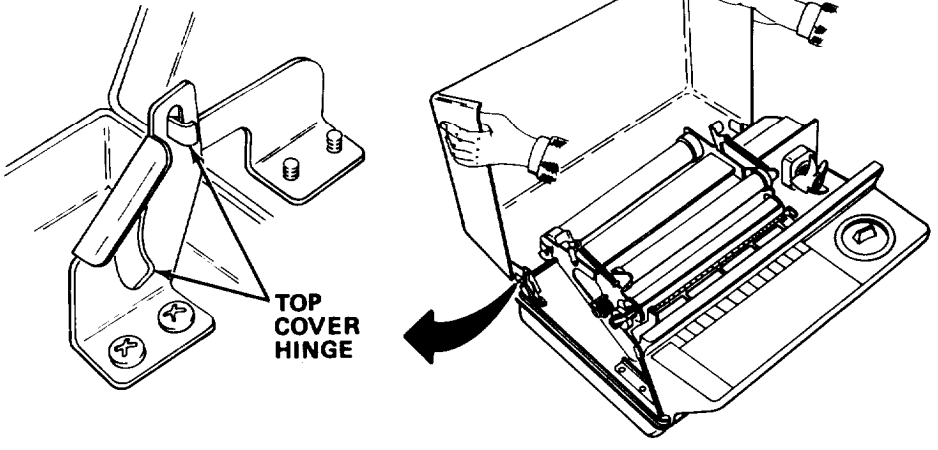
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing copy machine.

CAUTION

Damage to equipment may result if machine is not allowed to cool for a minimum of five minutes before opening top cover.

1. Unplug power cord.

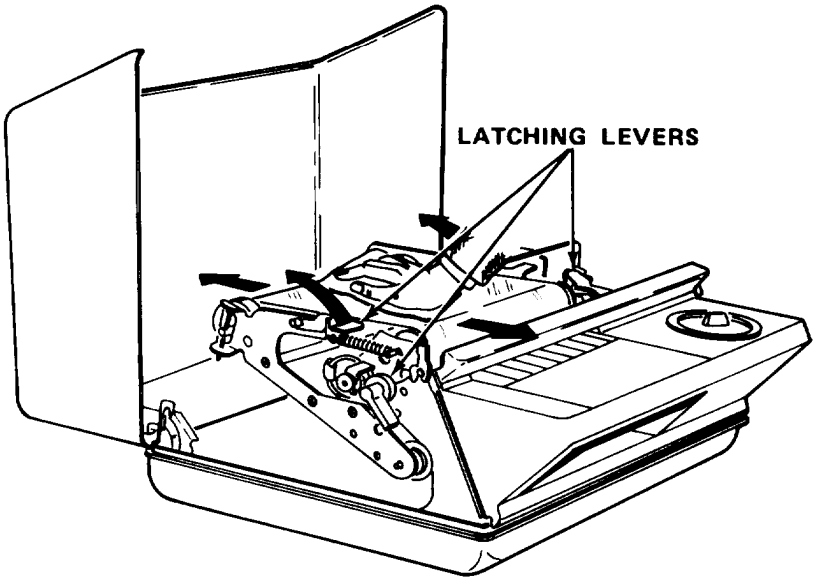


2. Open cover.

Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before W - Weekly AN - Annually (Number) - Hundreds of Hours
D - During M - Monthly S - Semiannually
A - After Q - Quarterly BI - Biennially

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		THERMOGRAPHIC COPY MACHINE - Cont	
3	W	Clean Belt and Print Roller - Cont	



3. Rotate reflector lock to unlocked position. Then release three latching levers by lifting up and to the rear.

4. Using belt cleaner and clean cheesecloth, clean exposed belt area.

Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

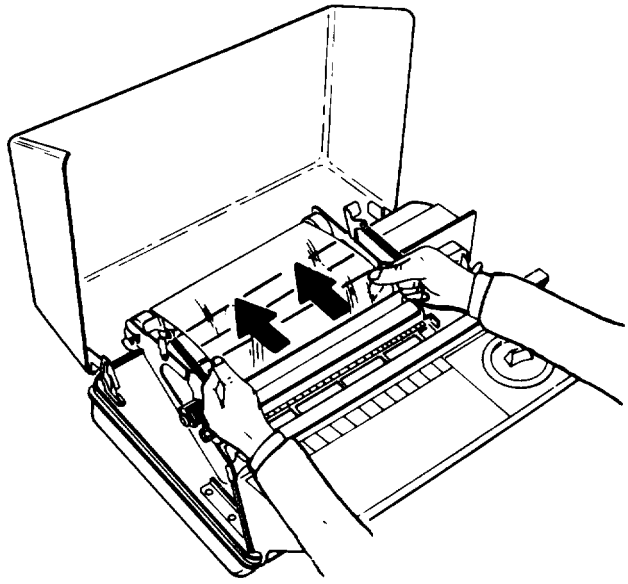
B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		THERMOGRAPHIC COPY MACHINE - Cont	
3	W	Clean Belt and Print Roller - Cont	



5. Move belt to expose uncleaned area.
6. Using belt cleaner and cheesecloth, clean exposed belt area.

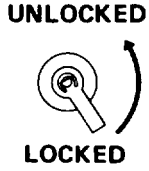


Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

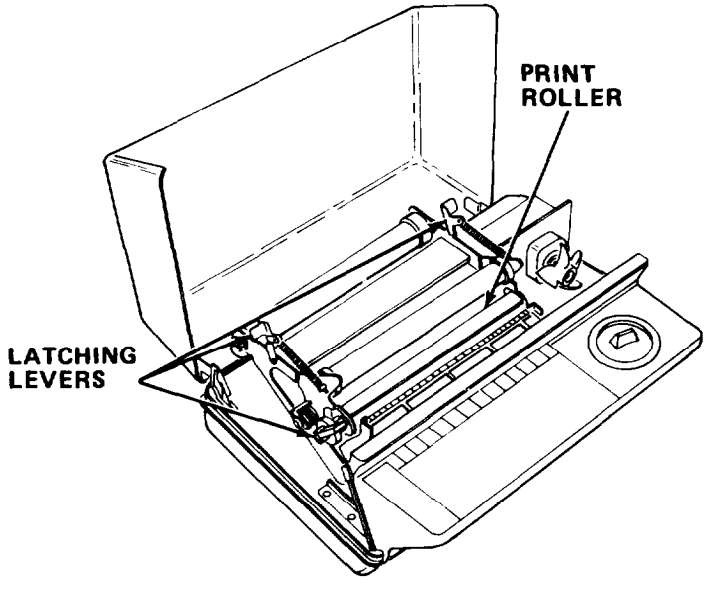
B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		THERMOGRAPHIC COPY MACHINE - Cont	
3	W	Clean Belt and Print Roller - Cont	



7. Using belt cleaner and clean cheesecloth, clean print roller.
8. Lock latching levers.
9. Rotate reflector lock down to locked position.
10. Close cover.
11. Plug in power cord.

Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

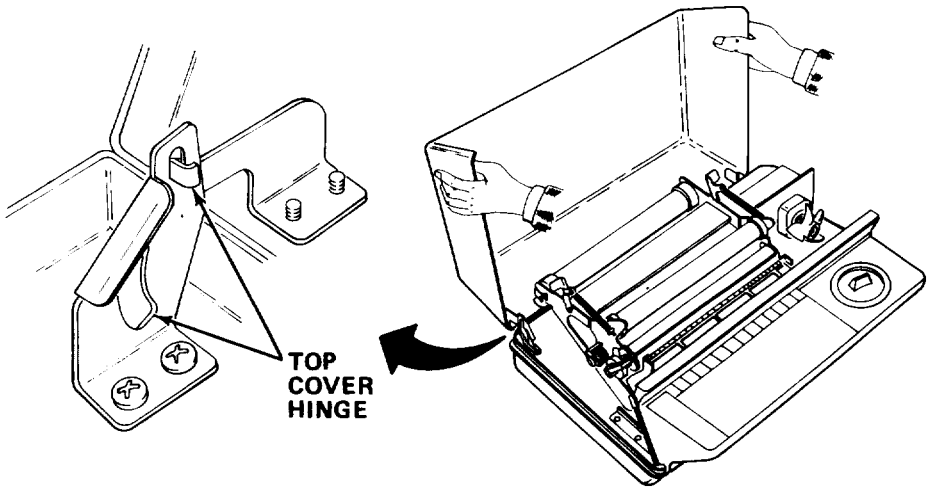
B - Before W - Weekly AN - Annually (Number) - Hundreds of Hours
D - During M - Monthly S - Semiannually
A - After Q - Quarterly BI - Biennially

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		THERMOGRAPHIC COPY MACHINE - Cont	
4	A	Clear Paper Jam.	

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing copy machine.

1. Unplug power cord.

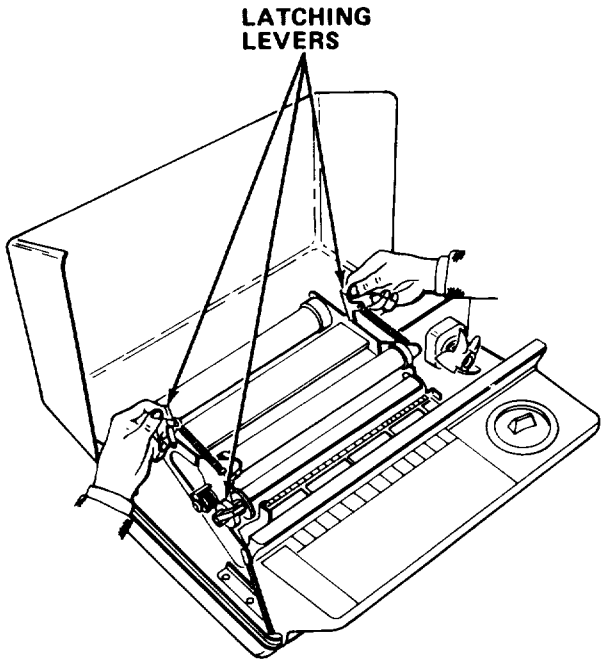


2. Open cover.
3. Locate paper jam.

Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before W - Weekly AN - Annually (Number) - Hundreds of Hours
D - During M - Monthly S - Semiannually
A - After Q - Quarterly BI - Biennially

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		THERMOGRAPHIC COPY MACHINE - Cont	
4	A	Clear Paper Jam - Cont	



4. Release latching levers.
5. Remove paper from rollers.
6. Lock latching levers.
7. Close cover.
8. Plug in power cord.

4-6. OPERATION UNDER USUAL CONDITIONS.

4-6.1 Operating Procedures.

a. Plug power cord into 120 V, 60 Hz grounded outlet.

CAUTION

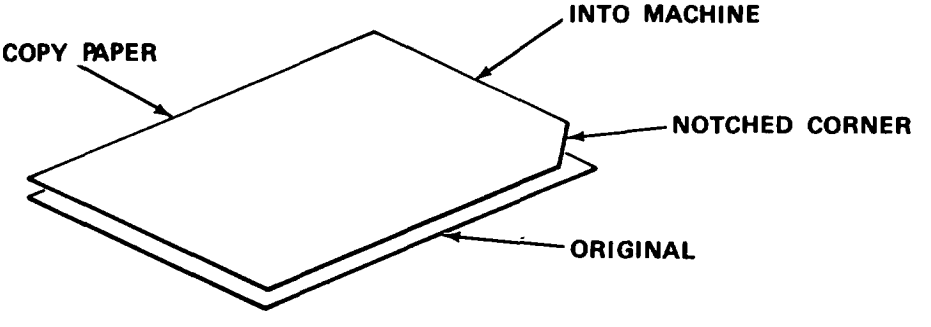
Remove all paper clips, staples, and pins from original, or damage to machine may result.

DARKER LIGHTER

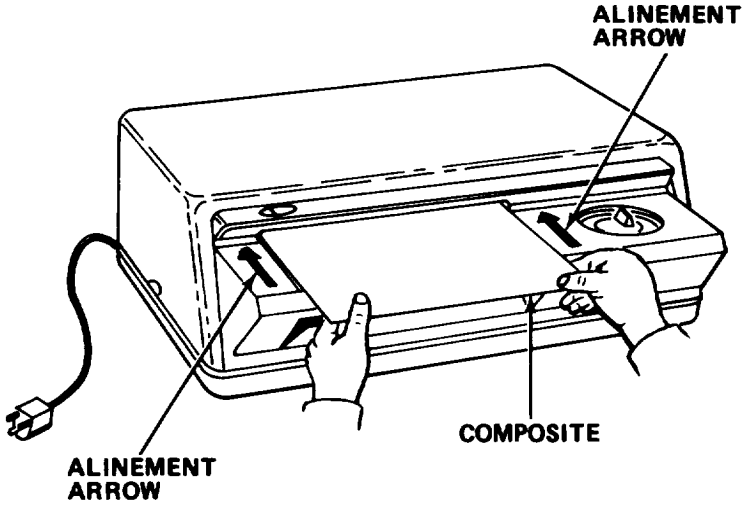
b. Use instructions provided with box of photographic supplies to determine initial correct exposure setting for that material, and position exposure control accordingly.

NOTE

- Always allow original to lead film or copy paper by 1/8 in. (3 mm).
- Use silk screen carrier if original is wrinkled, folded, or if it is smaller than supply item.



c. Place original on desk top with printed side up. Place transparency or copy paper on top of original. Notched corner must be in top right position.



d. Aline composite between two arrows on paper table, and insert it into slot with notched edge of composite on upper right. Copy machine automatically switches on when top cover is closed and composite is fed into slot.

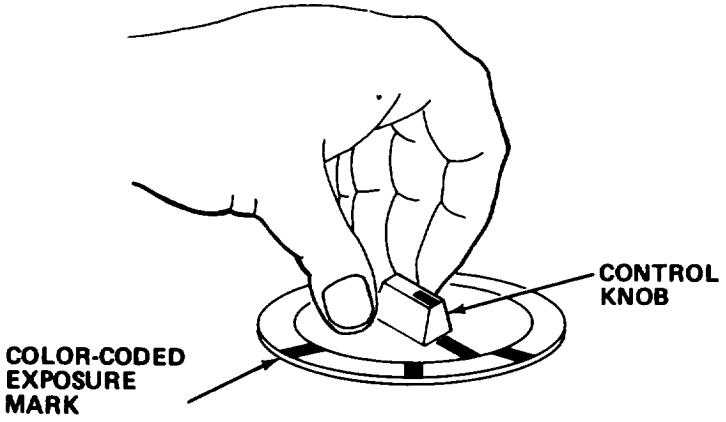
Original and completed copy will emerge from lower paper slot in approximately 24 seconds.

CAUTION

Do not remove power cord from outlet until cooling fan has stopped after completion of copying. Damage to equipment may result.

DARKER LIGHTER

f. Examine copy. If lighter or darker copy is required, move exposure control knob right or left as appropriate. Make another copy and check density. Adjust exposure control knob as required to achieve correct reproduction.



Exposure control dial has adjustable, color-coded exposure marks. When you find best settings for transparency films and paper copy materials, color marks can be set as guides. Remove exposure control knob by gently pulling upward. Position exposure guide marks by moving them right or left. Replace exposure control knob by pushing downward. Make note of which settings apply to transparency film or paper copy materials, and retain for future use.

h. Copy machine is fitted with resettable overheat thermostat which switches off exposure lamp in event of overheat condition. Exposure lamp will not come on again until copy machine has cooled and thermostat has been reset.

WARNING

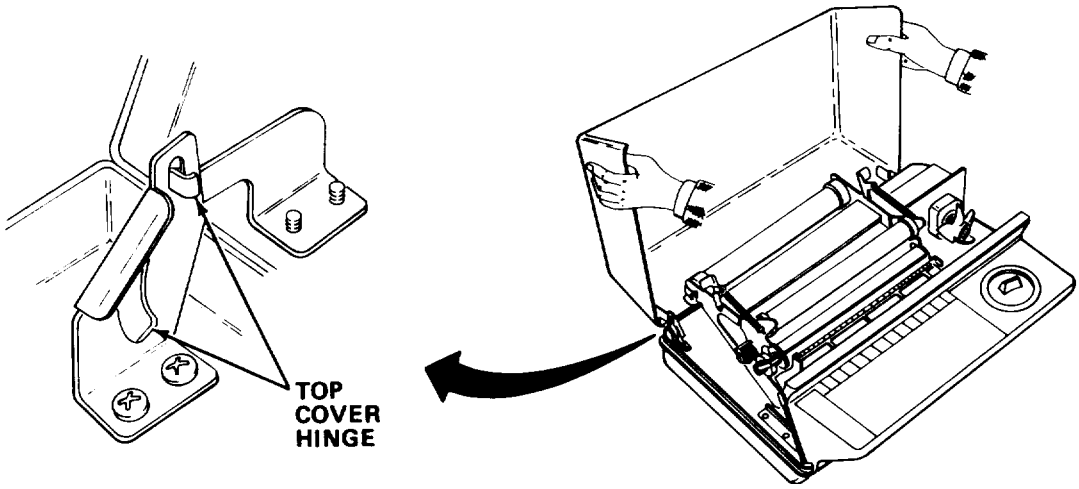
Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing the copy machine.

CAUTION

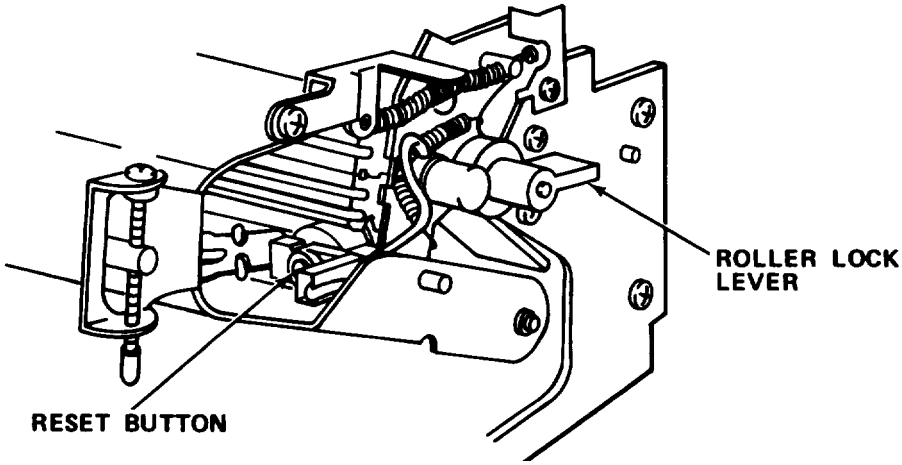
Allow minimum of five minutes for copy machine to cool before opening top cover, or damage to equipment may result.

i. To reset:

(1) Unplug power cord.



(2) Lift top cover at front and open toward rear of copy machine.



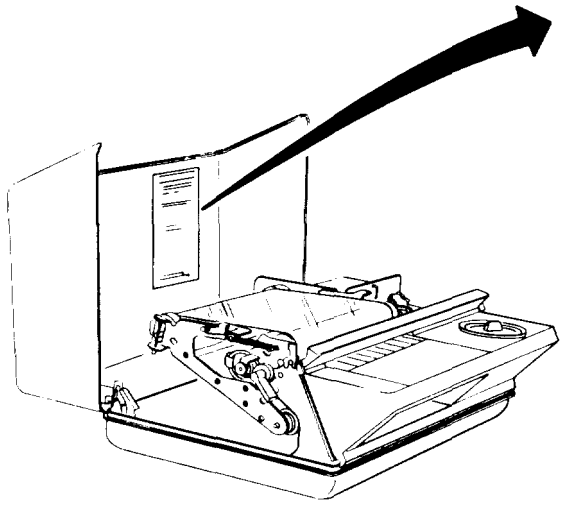
(3) Locate red roller lock lever on left side of copy machine. To rear of this lever and underneath exposure lamp reflector is reset button. Push reset button in.

(4) Close cover.

(5) Reconnect power cord to outlet.

(6) Copy machine is now ready for use.

4-6.2 Instructions on Decals and Instruction Plates.



FOR YOUR PROTECTION

THIS MACHINE IS EQUIPPED WITH A SAFETY INTERLOCK SWITCH WHICH REMOVES POWER FROM ALL COMPONENTS WHEN THIS COVER IS OPENED.

FOR YOUR SAFETY PLEASE DO NOT ATTEMPT TO DEFEAT IT.

4-7. OPERATION UNDER UNUSUAL CONDITIONS. This equipment is designed for operation only in a controlled environment.

Section III OPERATOR MAINTENANCE

4-8 LUBRICATION INSTRUCTIONS. This equipment does not require lubrication at the operator level of maintenance.

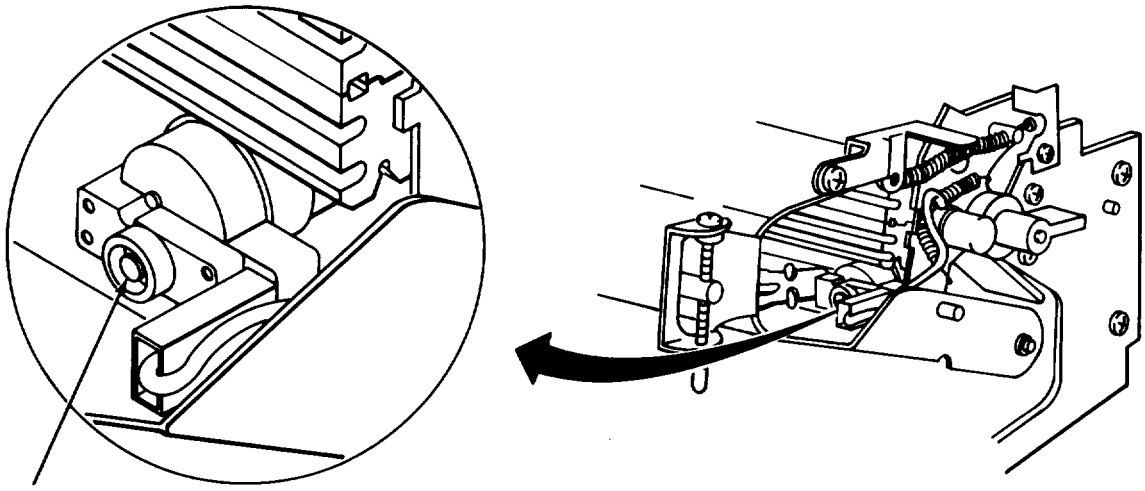
4-9 TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during operation or maintenance of the thermographic copier. You should perform the test/inspections and corrective actions in the order listed.

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

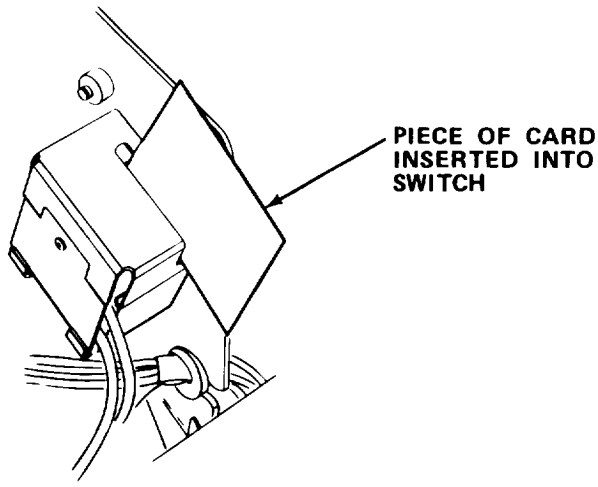
Table 4-2. TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. LIGHT STREAKS ON COPY.	Examine copy belt for dirt buildup.	Clean.
2. MATERIAL WRAPS AROUND PRESSURE ROLLER.	Check to see if print roller is dirty.	Clean.
3. WRINKLES FORM ON COPY BELT.	Check copy rate speed.	Allow more time between copies.
4. EXPOSURE LAMP DOES NOT OPERATE.		



RESET BUTTON

Table 4-2. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
4. EXPOSURE LAMP DOES NOT OPERATE - Cont	
	
Step 1. Check reset switch for tripped condition.	
(a) Insert piece of card into switch.	
(b) Allow copy machine to cool and reset.	
(c) Push reset button.	
Step 2. Inspect top cover interlock switch operation.	
Check that top cover is correctly closed.	
Step 3. Check copy belt and rollers to be sure copy materials are not preventing movement.	
Clear paper jam.	

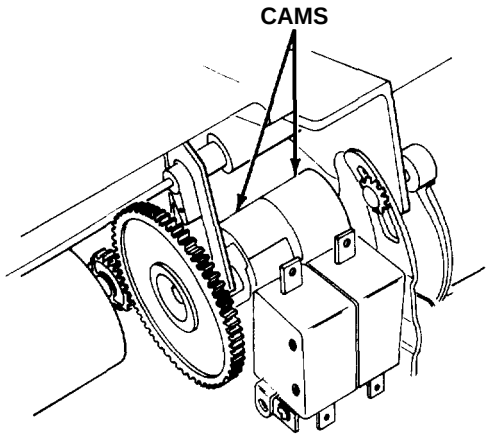
4-10. MAINTENANCE PROCEDURES. There are no operator maintenance procedures assigned for this equipment.

Section IV. ORGANIZATIONAL MAINTENANCE

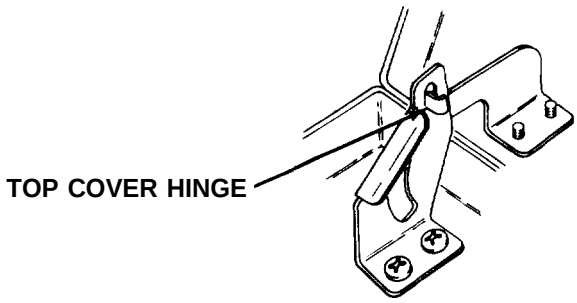
4-11. LUBRICATING INSTRUCTIONS.

NOTE

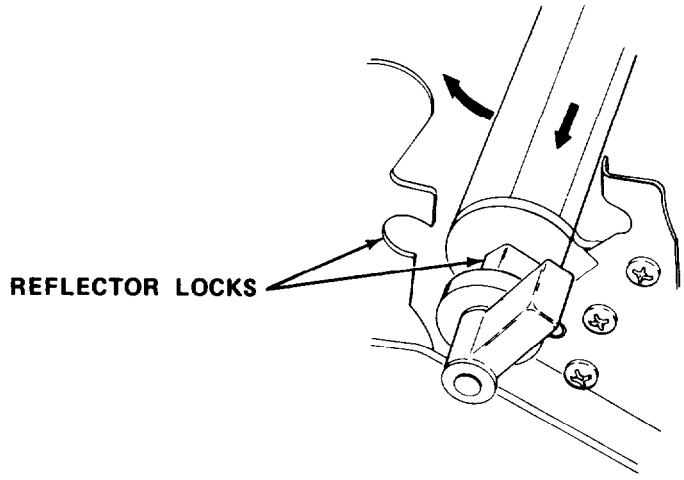
These lubrication instructions are mandatory.



Semiannually, lightly coat cams of distance delay mechanism with Anderol Lubricant 495 (Item 5, Appendix E).



b. Using Anderol Lubricant 495 (Item 5, Appendix E), lightly coat cover hinges of copier semiannually.



c. Lightly coat reflector locks semiannually with Anderol Lubricant 495 (Item 5, Appendix E).

4-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE) ; AND SUPPORT EQUIPMENT.

4-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

4-12.2 Special Tools; Test, Measurement, and Diagnostic Equipment; and Support Equipment. Special tools, TMDE, and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.

4-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-6675-324-24P covering organizational maintenance for this equipment.

4-13. SERVICE UPON RECEIPT.

4-13.1 Checking Unpacked Equipment.

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6, Packing Improvement Report.

b. Check the equipment against the packing list to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

c. Check to see whether the equipment has been modified.

4-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

a. PMCS are designed to keep the equipment in good working condition by performing certain tests, inspections and services. The intervals provide you, the organizational technician, with time schedules that determine when to perform specified tasks.

b. Item number column. Item numbers are assigned in chronological ascending sequence regardless of interval designation. These numbers are used for your “TM Number" column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording the results of PMCS.

c. Interval columns. This column determines the time period designated to perform your PMCS.

d. Item to be inspected and procedures column. This column lists functional groups and their respective assemblies and subassemblies as shown in the Maintenance Allocation Chart (Appendix B). The appropriate check or service procedure follows the specific item to be inspected.

e. List of tools and materials required for PMCS is as follows:

Item	Quantity
Cross Tip Screwdriver	1 ea
Flat Tip Screwdriver	1 ea
Multimeter	1 ea
Test Resistor (86.6 k ohms)	1 ea
Belt Cleaner (Item 6, Appendix E)	ar
Denatured Alcohol (Item 4, Appendix E)	ar
Duct Sealing Cloth Tape (Item 29, Appendix E)	ar
Cheesecloth (Item 7, Appendix E)	ar

Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

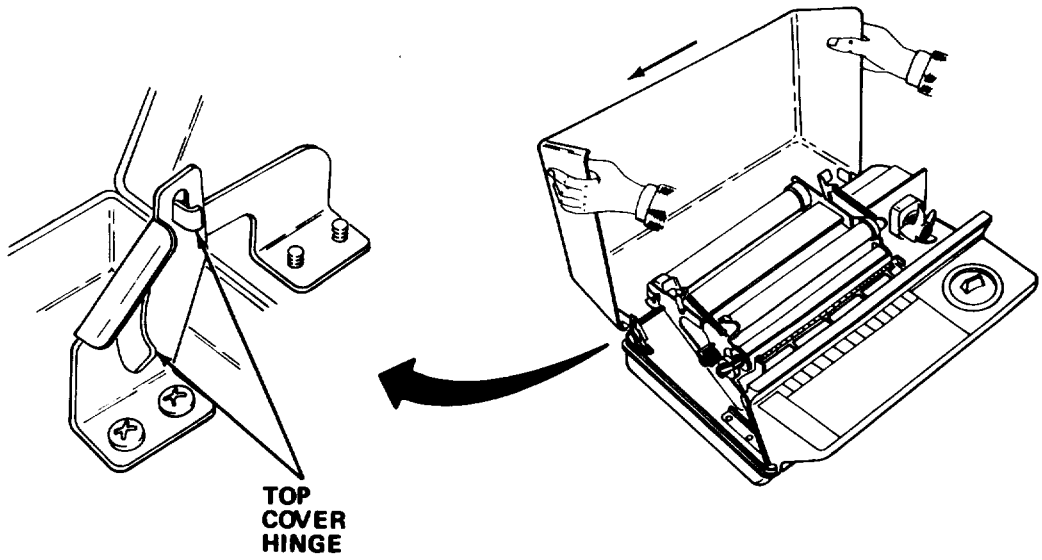
(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE
1	S	Service Copy Machine.

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing copy machine.

1. Unplug power cord.



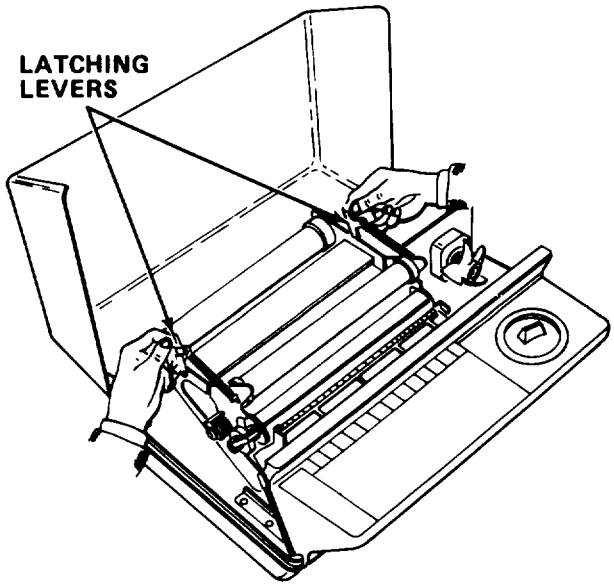
2. Remove screws and top cover.

Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	S - Semiannually	
A - After	Q - Quarterly	BI - Biennially	

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont

3. Rotate red reflector locking lever up to unlocked position.

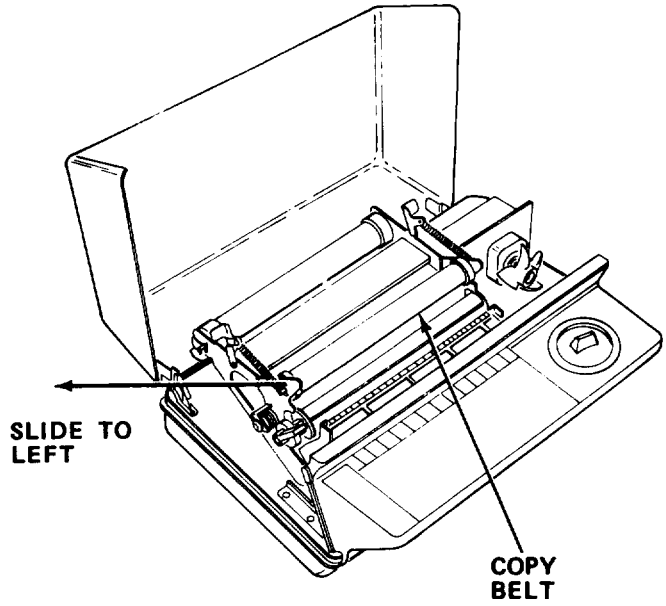


4. Raise two rear latching levers simultaneously and push toward back of copy machine.

Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	S - Semiannually	
A - After	Q - Quarterly	BI - Biennially	

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont

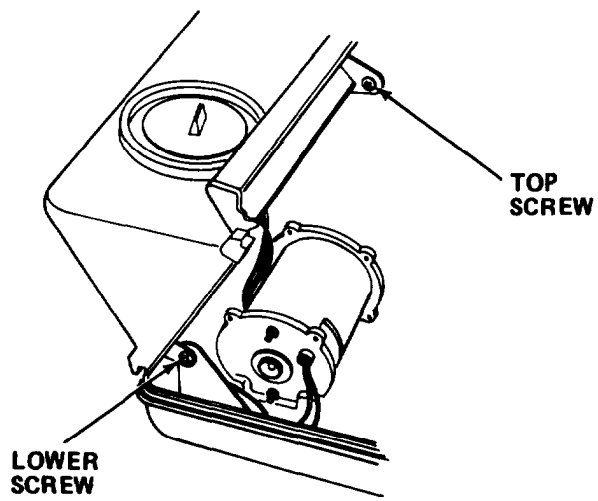


5. Remove copy belt by sliding it off rollers to left of copy machine.

Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	S - Semiannually	
A - After	Q - Quarterly	BI - Biennially	

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont



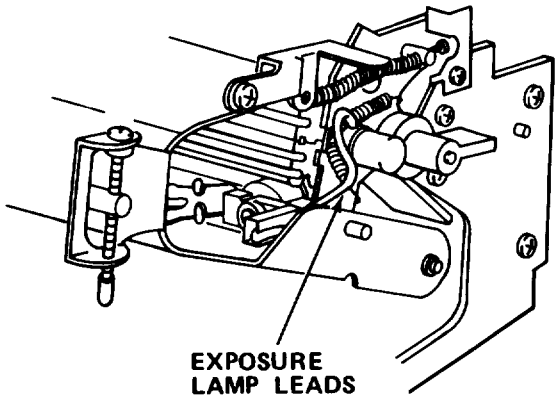
6. Loosen two lower screws and remove top screws at both ends of front console.

7. Remove console by lifting up and pulling forward. Do not disconnect exposure control cables.

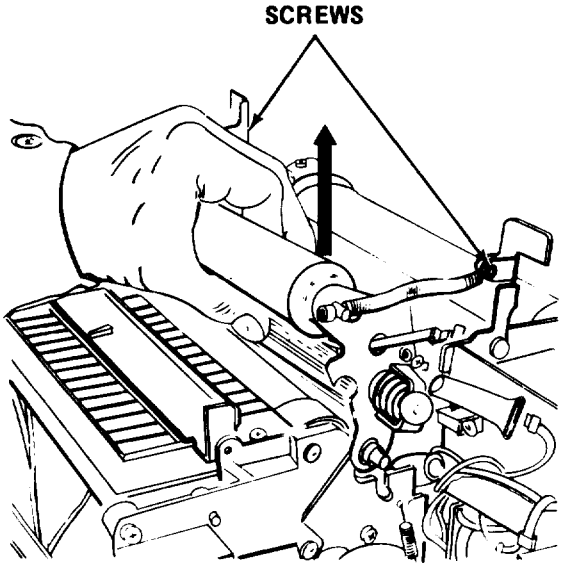
Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After	W - Weekly M - Monthly Q - Quarterly	AN - Annually S - Semiannually BI - Biennially	(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont



8. Remove two screws securing spring latches.



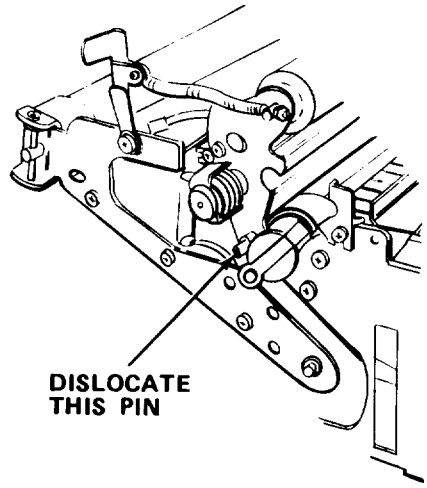


Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	S - Semiannually	
A - After	Q - Quarterly	BI - Biennially	

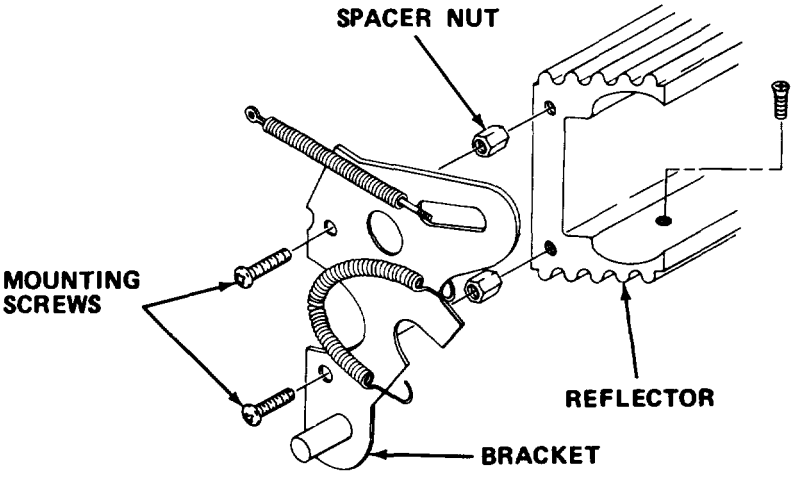
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont
		9. Lift right end of lamp and roller assembly up, sliding pin up and out of slot. Then move assembly to the right and remove from copier.
		NOTE Do not remove assembly from copier until exposure lamp leads are disconnected.
		10. Disconnect exposure lamp leads.
		
		11. Remove springs, two bracket retaining screws, and bracket at each end of reflector.

Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

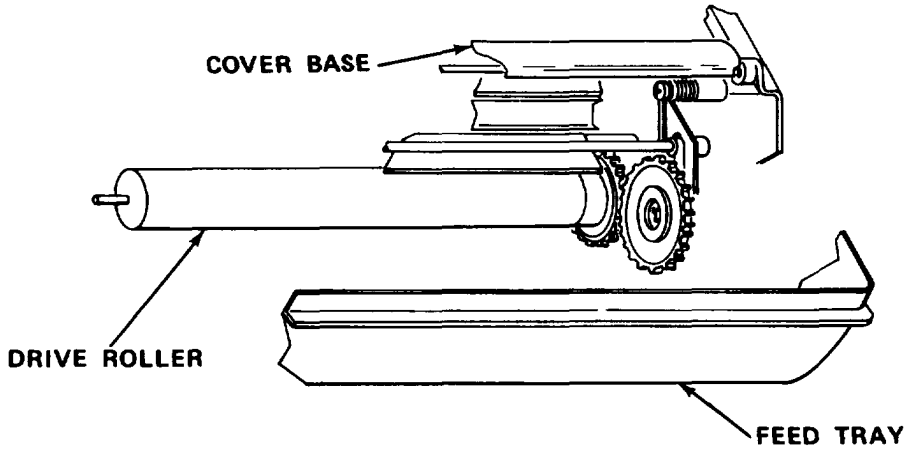
B - Before D - During A - After	W - Weekly M - Monthly Q - Quarterly	AN - Annually S - Semiannually BI - Biennially	(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont
		CAUTION Do not touch exposure lamp with bare fingers. Fingerprints on glass will cause premature failure of exposure lamp. If inadvertently touched, clean it with cloth moistened with alcohol and then dry.
		12. Clean reflector with cheesecloth moistened with denatured alcohol.
		13. Reinstall brackets and secure with screws. Reinstall spring latches and secure with screws. Reconnect exposure lamp leads.
		CAUTION Do not let alcohol drip on components, or damage to components can result.
		14. Clean pressure roller with cheesecloth moistened with denatured alcohol.
		15. Using cheesecloth moistened with mild solution of detergent and water, clean blower housing, base plate, inside and outside of cabinet, and front console. Wipe dry with clean cheesecloth.

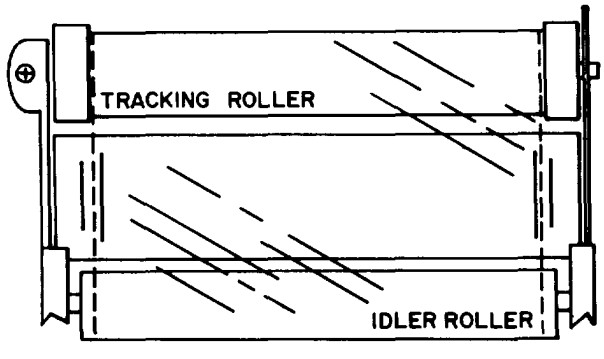
Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After	W - Weekly M - Monthly Q - Quarterly	AN - Annually S - Semiannually Bl - Biennially	(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont



16. Clean drive roller.



17. Using belt cleaner, clean copy belt inside and out, idler roller, and tracking roller.

Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After	W - Weekly M - Monthly Q - Quarterly	AN - Annually S - Semiannually BI - Biennially	(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont
		18. Reinstall exposure lamp and reflector assembly into frame.
		19. Reconnect spring latch and secure with screws.
		20. Reconnect exposure lamp leads.
		21. Reinstall copy belt by sliding over rollers from left to right. Center belt on rollers.
		22. Pull both latching levers forward and push them down.
		23. Rotate reflector lock down to locked position.
		WARNING High-intensity light and heat are present. Do not touch or look directly into lamp, or personal injury can result.
		24. Check exposure lamp voltage.
		NOTE Mark exposure control potentiometer leads and connectors with identification tags prior to removal to be sure of correct reconnection.

Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After	W - Weekly M - Monthly Q - Quarterly	AN - Annually S - Semiannually BI - Biennially	(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont

WARNING

- Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.
- High intensity light and heat are present. Do not touch or look directly into lighted lamp, or personal injury may occur.

25. Using a multimeter set to 0-500 V ac range, connect test leads to lamp terminals.

26. Plug in power cord.

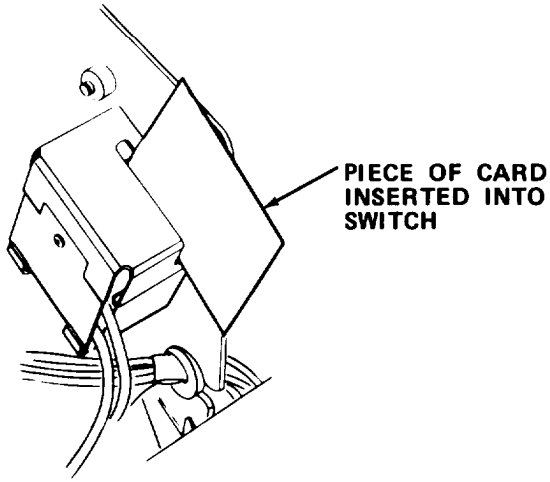


Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After	W - Weekly M - Monthly Q - Quarterly	AN - Annually S - Semiannually BI - Biennially	(Number) - Hundreds of Hours	

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont
		27. Using a piece of plastic card, operate interlock switch by inserting it as shown.
		28. Place a piece of paper into paper feed slot to operate paper trigger switch.
		NOTE On models A through C, lamp voltage will read 280 V ac. On models D through F, lamp voltage will read 117 V ac.
		29. With lamp illuminated, check voltage. If voltage is incorrect, perform steps 31 through 33. If voltage is correct, proceed to step 34.
		30. Unplug power cord.
		31. Locate voltage adjustment taps on power transformer. Note position of moveable tap.
		a. If voltage was low, disconnect movable tap and connect it to tap marked with next higher voltage.
		b. If voltage was high, move tap to next lower voltage.
		NOTE If transformer's last tap is connected and correct voltage cannot be obtained, troubleshoot transformer.

Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After	W - Weekly M - Monthly Q - Quarterly	AN - Annually S - Semiannually BI - Biennially	(Number) - Hundreds of Hours

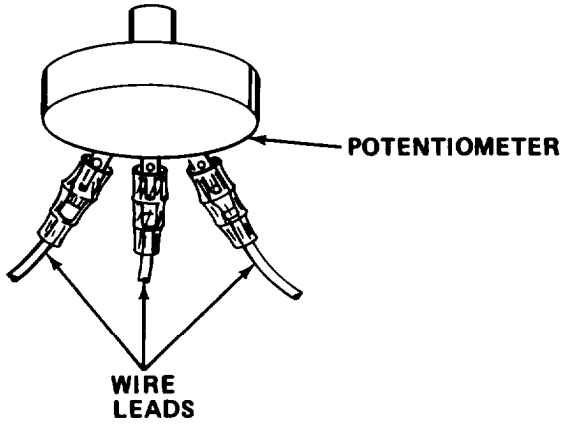
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont
		32. Recheck exposure lamp voltage.
		NOTE Mark exposure control potentiometer leads and connectors with identification tabs prior to removal to be sure of correct reconnection.
		
		33. Tag and disconnect three leads from exposure control potentiometer mounted underneath front console control.
		NOTE ● This adjustment must be performed when replacing the circuit card, drive motor, or thermistor. Lamp voltage must be within specification prior to adjustment. ● The following step applies only to models D through F.

Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After	W - Weekly M - Monthly Q - Quarterly	AN - Annually S - Semiannually BI - Biennially	(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont 34. Disconnect one lead from exposure lamp. 35. Place a small piece of masking tape on copy belt in easily visible location. **NOTE** Type and configuration of circuit card varies between models of copier. Verify type of card installed prior to connecting calibration resistor in circuit.

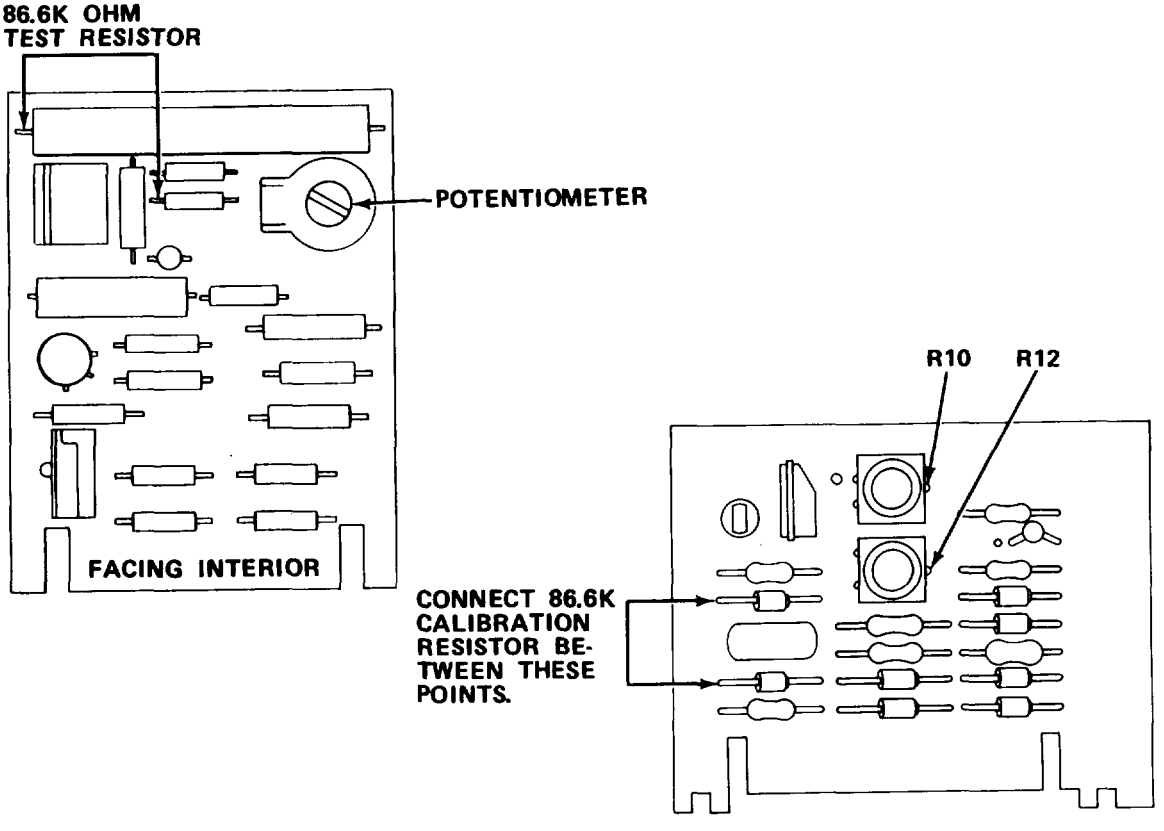


Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After	W - Weekly M - Monthly Q - Quarterly	AN - Annually S - Semiannually BI - Biennially	(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont
		36. Connect 86.6 k ohm test resistor to circuit card as shown.
		37. Using a piece of card, operate interlock switch.
		38. Operate paper trigger switch.
		39. Observe copy belt markers. One complete revolution should take 24 ±2 seconds.
		40. If copy belt speed is too slow, turn potentiometer R10 to the left. If speed is too high, turn potentiometer R10 to the right.
		41. Remove card from interlock switch.
		42. Disconnect test resistor from circuit card.
		43. Reconnect exposure control potentiometer.

Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

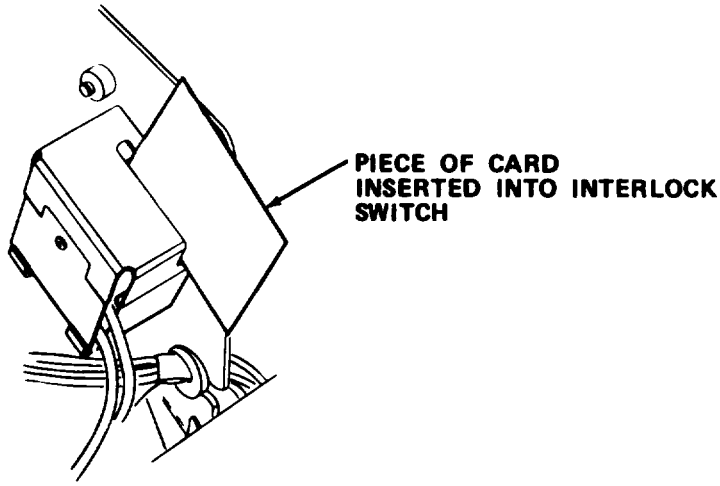
B - Before D - During A - After	W - Weekly M - Monthly Q - Quarterly	AN - Annually S - Semiannually BI - Biennially	(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont
		NOTE Prior to adjusting belt speed, make certain that lamp voltage and heat compensation calibration adjustments are made and that machine is at room temperature.
		44. Using a piece of card, operate interlock switch.
		45. Rotate the console speed control potentiometer to its full left position.
		NOTE One revolution of the copy belt should take: ● Model 45A: 15 -16 seconds ● Model 45B - 45C prior to serial number 450001: 24 - 26 seconds ● Model 45C after serial number 450001 through Model 45F: 22 - 26 seconds
		46. Rotate potentiometer R12 to the right to increase speed, to the left to decrease.
		47. Remove card from interlock switch.
		48. Reconnect exposure lamp (models E and F).

Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN - Annually	(Number) - Hundreds of Hours	
D - During	M - Monthly	S - Semiannually		
A - After	Q - Quarterly	BI - Biennially		

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont



49. Insert card into interlock switch to operate.

50. Check delay switch by inserting a piece of paper of normal copy size into paper slot.

NOTE

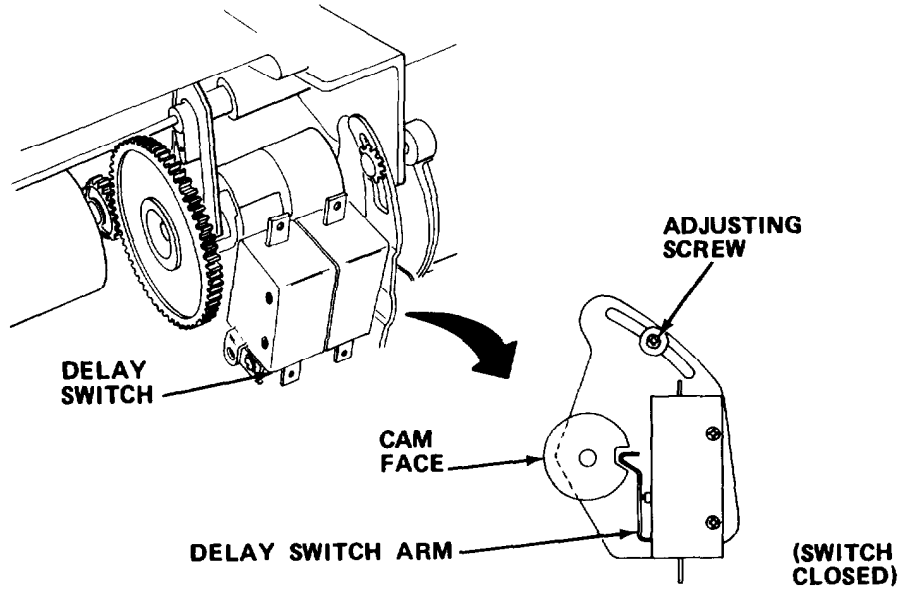
Exposure lamp should energize immediately after trigger arm is depressed and de-energize at end of copy cycle.

51. If above conditions are not met, adjust delay switch as follows:

Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After	W - Weekly M - Monthly Q - Quarterly	AN - Annually S - Semiannually Bl - Biennially	(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont



a. Loosen adjusting screw on delay switch mechanism.

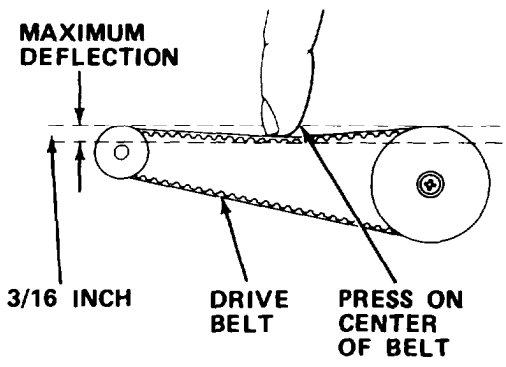
b. Position switch so that delay switch arm rests on high face of cam. Tighten adjusting screw, and operate copy machine as before to check adjustment.

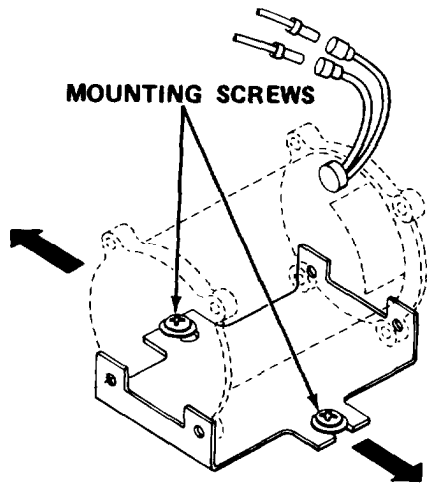
52. Check drive belt tension by applying moderate pressure onto center of belt. Belt should deflect a minimum of 1/16 in. (1.6 mm) and a maximum of 3/16 in. (4.7 mm).

Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before D - During A - After	W - Weekly M - Monthly Q - Quarterly	AN - Annually S - Semiannually BI - Biennially	(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont





53. If above condition is not met, loosen two motor mounting screws. If belt is too slack, move motor toward front of copy machine. If belt is too tight, move motor toward rear of copy machine until tension is correct. Retighten motor mounting screws.

54. Run copy machine for one minute by placing a piece of paper into top paper slot to actuate paper trigger switch.

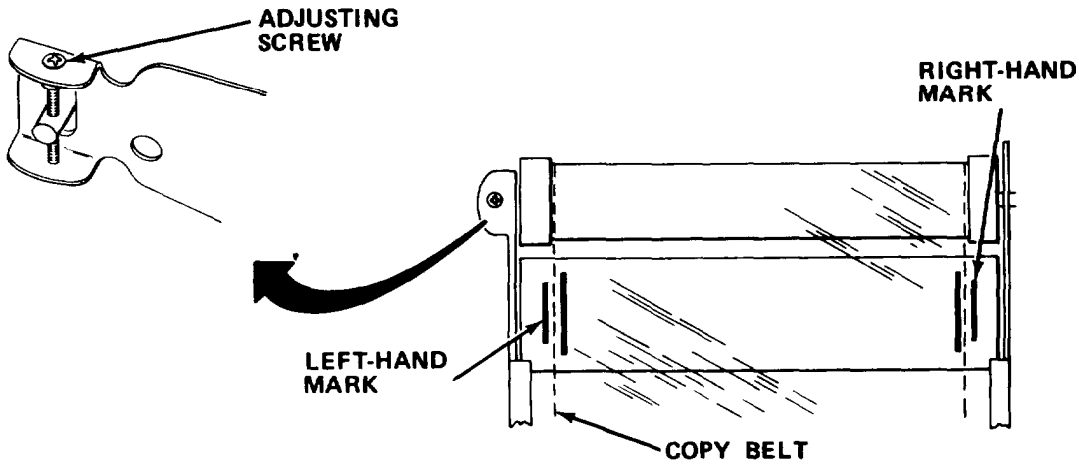
CAUTION

Do not move belt adjusting screw more than two turns in either direction, or damage to belt can result.

Table 4-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before	W - Weekly	AN - Annually	(Number) - Hundreds of Hours
D - During	M - Monthly	S - Semiannually	
A - After	Q - Quarterly	BI - Biennially	

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		THERMOGRAPHIC COPY MACHINE - Cont
1	S	Service Copy Machine - Cont



55. Observe copy belt for correct tracking. If belt has moved to right beyond mark, move adjusting screw right one turn. If belt has moved to left beyond mark, move adjusting screw one turn left.

56. Run copy machine for one minute to check alinement and repeat step 55 as required.

57. Reinstall front console.

58. Close top cover and place copy machine in service.

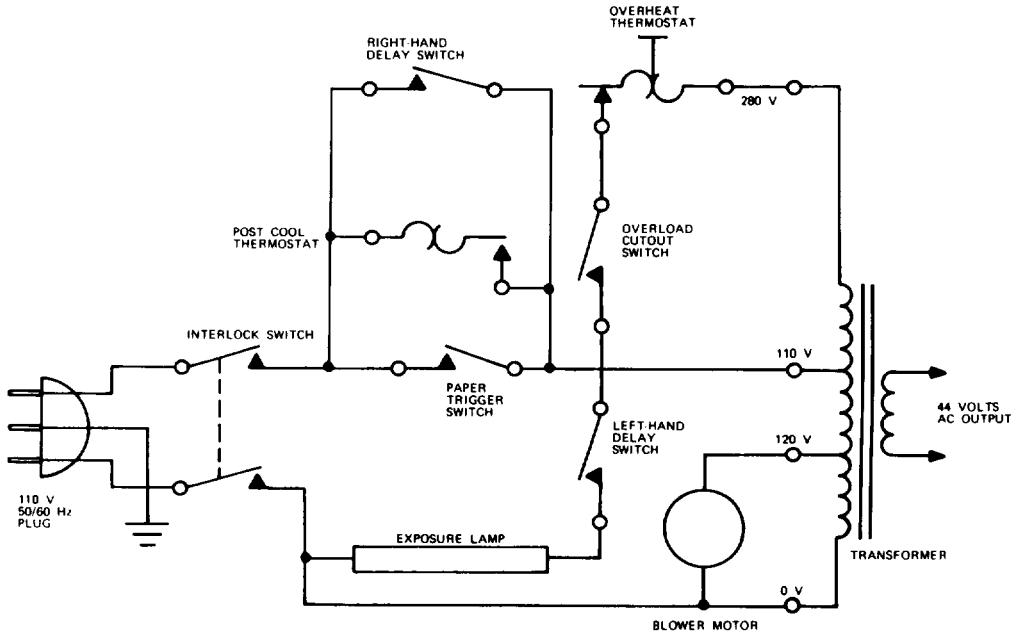
4-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES.

a. Organizational troubleshooting procedures cover the most common malfunctions that may be repaired at the organizational level. Repair or adjustment requiring specialized equipment is not authorized unless such equipment is available. Troubleshooting procedures used by the operator should be conducted in addition to the organizational troubleshooting procedures.

b. This manual cannot list all the possible malfunctions or every possible test/inspection and corrective action. If a malfunction is not listed or corrected by a listed corrective action, notify your supervisor.

c. If the thermographic copy machine does not power up when turned on, verify that 120 V ac is present at the receptacle. If voltage is not present, plug copier into receptacle with power available and proceed with equipment troubleshooting. Perform no-power procedures for dead receptacle (Table 1-4).

d. For unidentified malfunctions, use the facing schematics or the foldout located at the end of this manual for further fault analysis.


OVERHEAT THERMOSTAT
RIGHT-HAND DELAY SWITCH
280 V
POST COOL THERMOSTAT
OVERLOAD CUTOUT SWITCH
INTERLOCK SWITCH
110 V
PAPER TRIGGER SWITCH
LEFT-HAND DELAY SWITCH
120 V
44 VOLTS AC OUTPUT
110 V 50/60 Hz PLUG
EXPOSURE LAMP
TRANSFORMER
0 V
BLOWER MOTOR

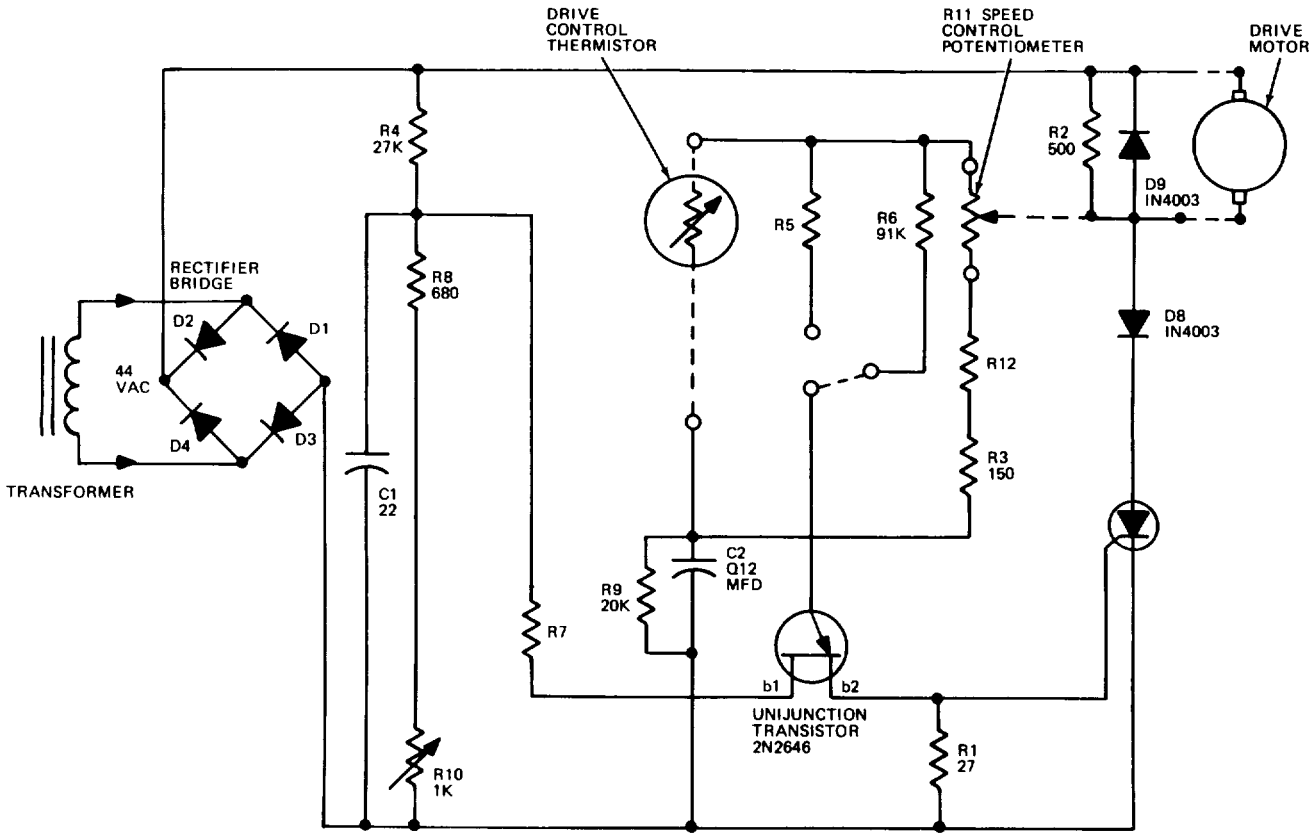
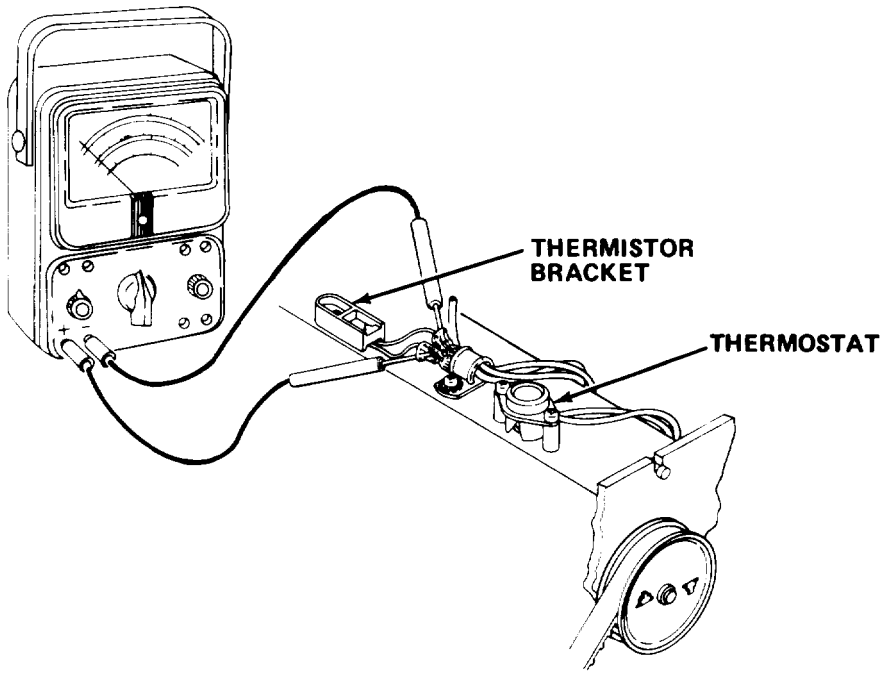

DRIVE CONTROL THERMISTOR
R11 SPEED CONTROL POTENTIOMETER
DRIVE MOTOR
R4 27K
R2 500
D9 IN4003
R5
R6 91K
RECTIFIER BRIDGE
R8 680
D2
D1
44 VAC
D8 IN4003
R12
D4
D3
TRANSFORMER
C1 22
R3 150
C2 Q12 MFD
R9 20K
R7
b1
b2
UNIJUNCTION TRANSISTOR 2N2646
R10 1K
R1 27

Table 4-4. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. EXPOSURE LAMP DOES NOT OPERATE.	Examine exposure lamp for filament failure.	Replace exposure lamp (paragraph 4-16.12).
2. NO DRIVE MOTOR SPEED INCREASE WITH TEMPERATURE RISE.	NOTE Print roller must be removed for access to thermistor.	



Check thermistor with multimeter. Resistance at normal room temperature 68°F (20°C) should be 106.7 k ohms ± 10%.

Replace thermistor (paragraph 4-16.3).

Table 4-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

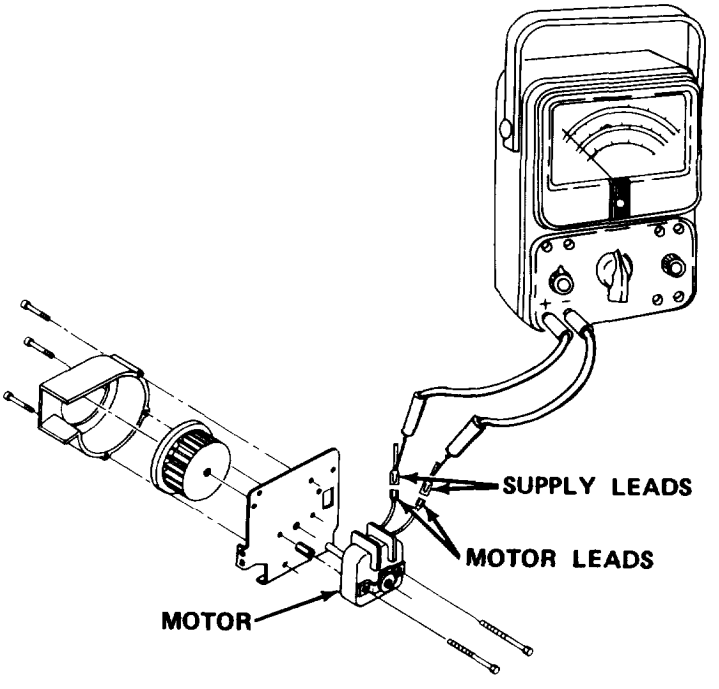
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

3. OVER OR UNDERCOMPENSATION FOR TEMPERATURE RISE.

Step 1. Check thermistor with multimeter. Resistance at normal room temperature 68°F (20°C) should be 106.7 k ohms ± 10%.

(a) If thermistor is good, proceed to step 2.

(b) Replace if defective (paragraph 4-16.3)



Step 2. Check for free and correct operation of blower unit as follows:

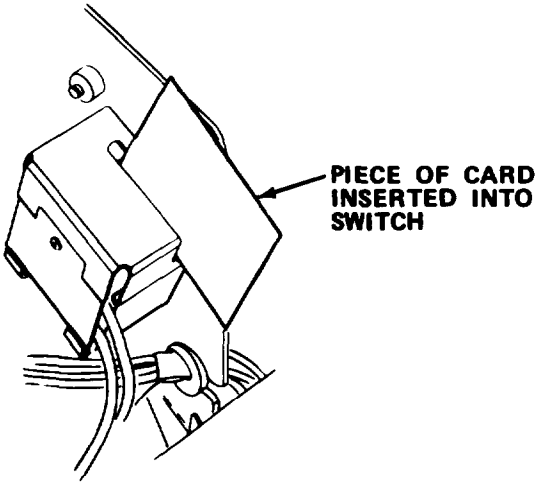
(a) Set multimeter to 0-200 V ac range.

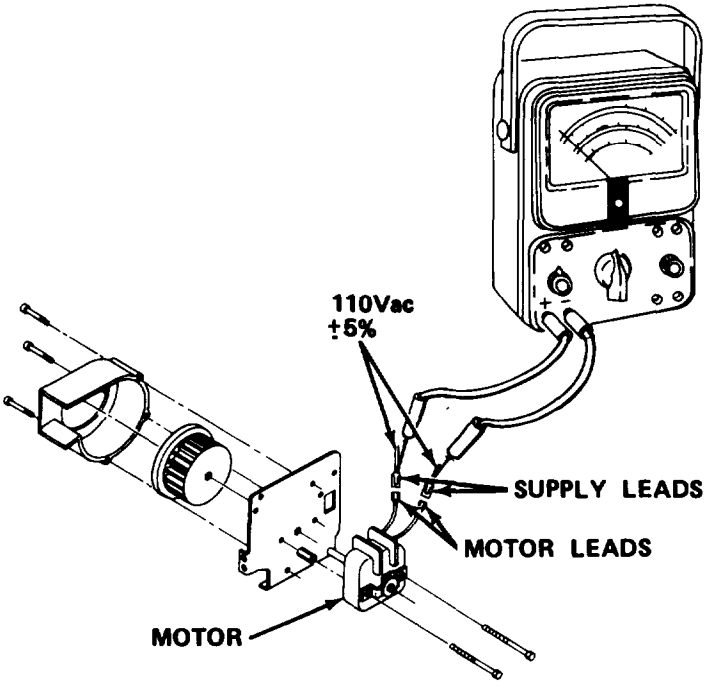
(b) Connect meter leads to blower motor supply leads.

Table 4-4 ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

3. OVER OR UNDERCOMPENSATION FOR TEMPERATURE RISE - Cent





(c) Plug in machine power cord. Operate the interlock switch.

(d) Energize machine by placing paper into upper paper slot.

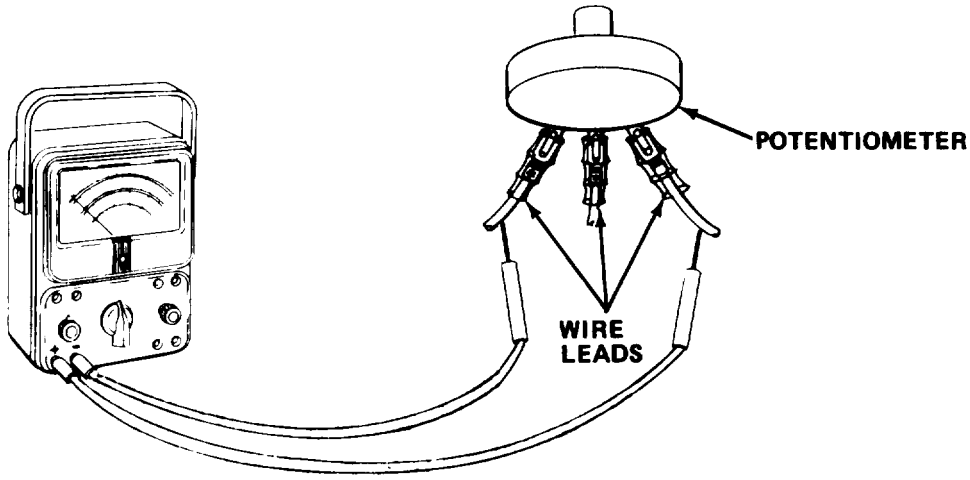
Table 4-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
3. OVER OR UNDERCOMPENSATION FOR TEMPERATURE RISE - Cent
(e) Check voltage on meter. It should be 110 V ac ± 5%.
(f) If correct voltage is present, proceed to step 3.
(g) If voltage is incorrect, replace blower motor (paragraph 4-16.9).
Step 3. Check exposure lamp voltage. Place multimeter across 280 V secondary of power transformer. Voltage should be 280 V ± 10%.
(a) adjust power transformer tap if voltage is above or below limits.
(b) Replace transformer if voltage will not adjust (paragraph 4-16.11).
4. MOTOR RUNS AT HIGH SPEED.
Step 1. Check thermistor with multimeter. Resistance at normal room temperature 68°F (20°C) should be 106.7 k ohms ± 10%.
(a) If multimeter indicates correct resistance, proceed to step 2.
(b) If incorrect resistance is indicated, replace thermistor (paragraph 4-16.3).

Table 4-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

4. MOTOR RUNS AT HIGH SPEED - Cont



Step 2. Check exposure control potentiometer. Resistance should be 87 k ohms ± 10%.

(a) If correct resistance is present, proceed to step 3.

(b) If incorrect resistance is indicated, replace potentiometer (paragraph 4-16.7).

Step 3. Check both thermistor and exposure control potentiometer.

If good, replace PC board (paragraph 4-16.8).

Table 4-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

5. MOTOR RUNS AT LOW SPEED.

Step 1. Check thermistor with multimeter. Resistance at normal room temperature 68°F (20°C) should be 106.7 k ohms ± 10%.

(a) if multimeter indicates correct resistance, proceed to step 2.

(b) If incorrect resistance is shown, replace thermistor (paragraph 4-16.3).

Step 2. Check exposure control potentiometer. Resistance should be 87 k ohms ± 10%.

(a) If multimeter indicates incorrect resistance, replace potentiometer (paragraph 4-16.7).

6. BLOWER MOTOR RUNS BUT DRIVE MOTOR DOES NOT.

Step 1. Check operation of paper trigger switch.

(a) If operation is satisfactory, proceed to step 2.

(b) If operation is faulty, replace switch (paragraph 4-16.6).

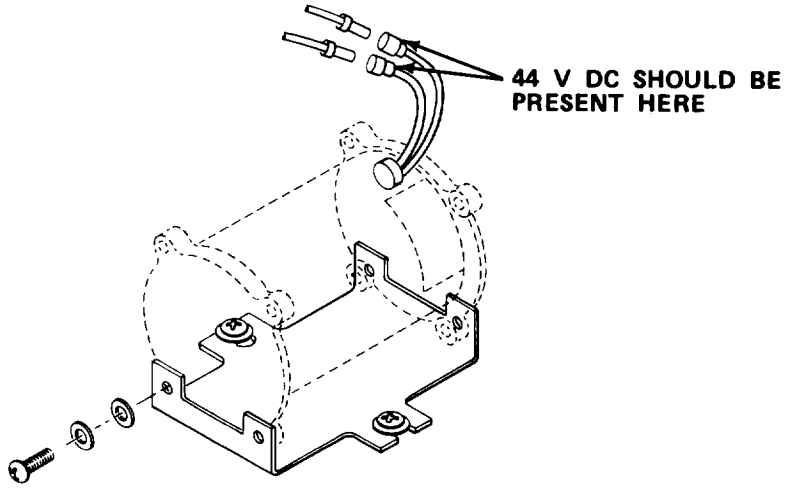
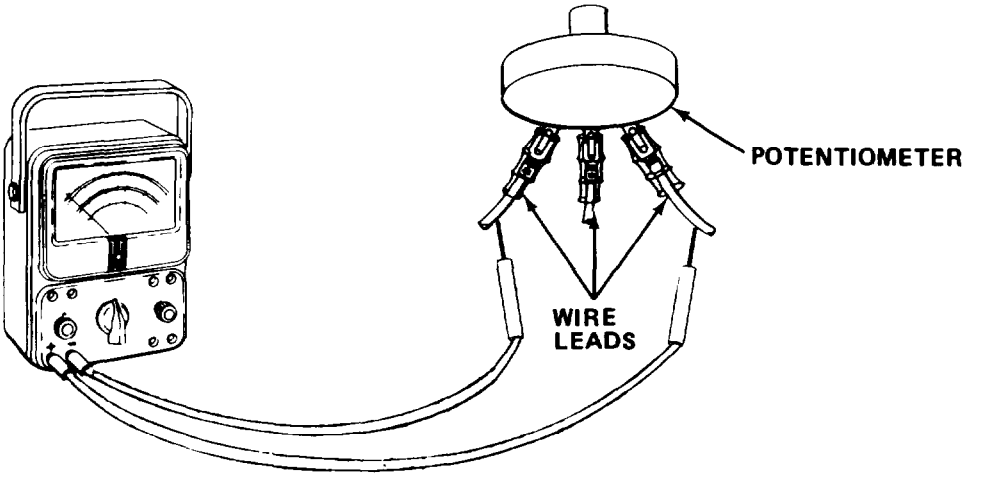


Table 4-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
6. BLOWER MOTOR RUNS BUT DRIVE MOTOR DOES NOT - Cent	
Step 2. Check for 44 V dc supply to drive motor at motor leads.	
	(a) If no voltage is indicated, check PC board and power transformer outputs.
	(b) If 44 V dc is present, motor has failed. Replace motor (paragraph 4-16.10).



Step 3. Check exposure control potentiometer. Resistance should be 87 k ohms ± 10%.	
	(a) Replace potentiometer (paragraph 4-16.7)
	(b) Replace PC board (paragraph 4-16.8).
7. LIGHT STREAKS ON COPY.	
Check exposure lamp for darkened glass or sagging filament.	
	Replace exposure lamp (paragraph 4-16. 12).

4-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the thermographic copy machine. Personnel required are listed only if the task requires more than one.

b. After completing each maintenance procedure, perform operational check to be sure that equipment is properly functioning.

INDEX

4-16.1 Replace Post Cool Thermostat.

MOS: 83FJ6, Reproduction Equipment Repairer

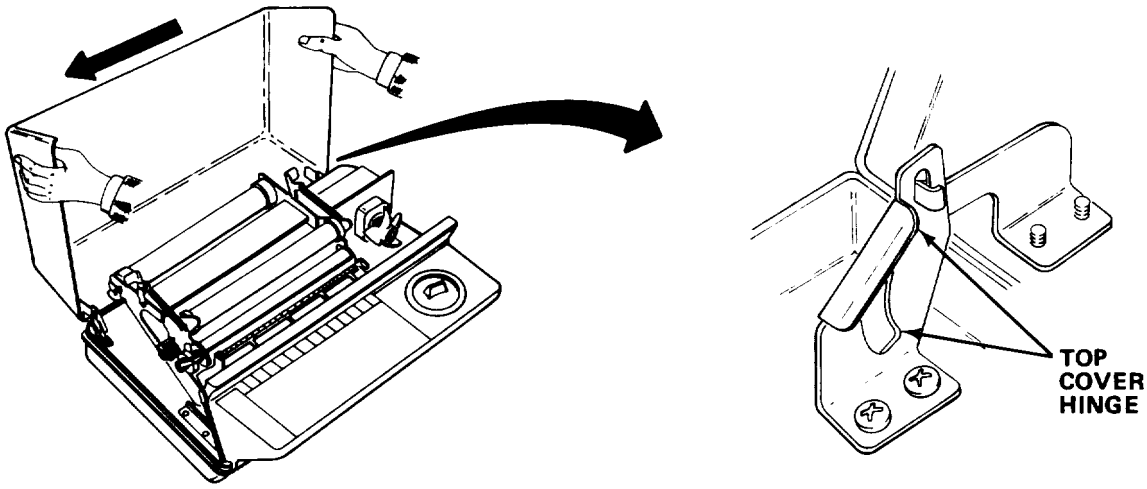
TOOLS: Cross Tip Screwdriver (6 in.)

SUPPLIES: Post Cool Thermostat

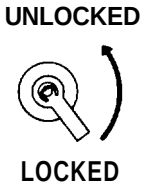
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing the copy machine.

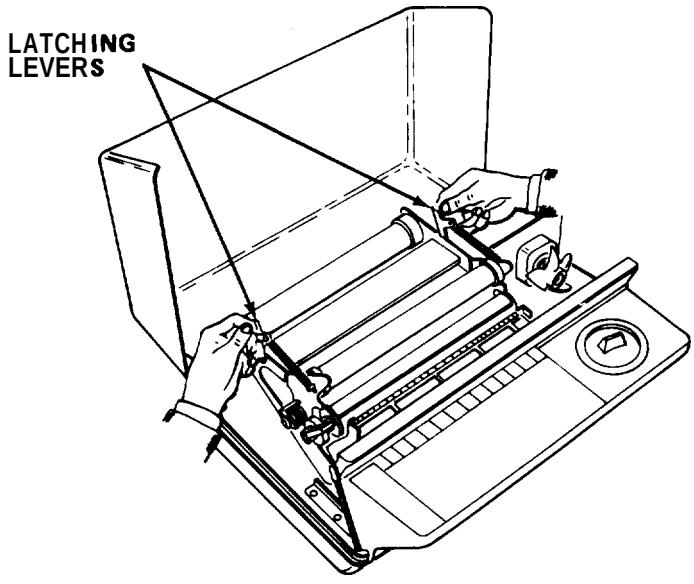
a. Unplug power cord.



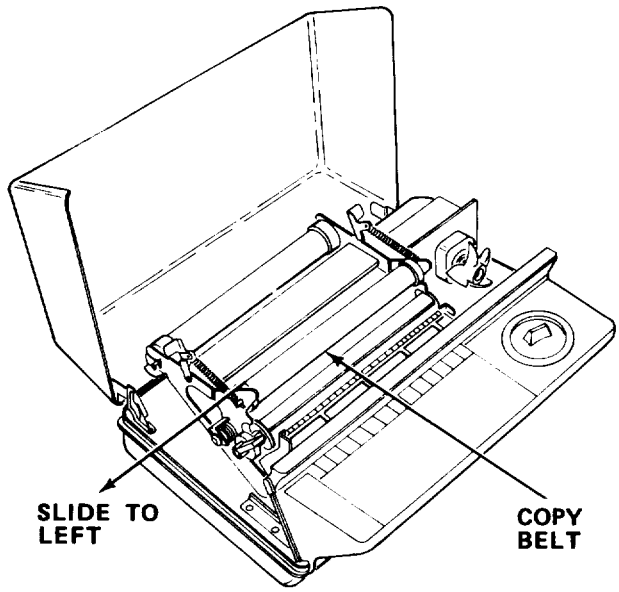
b. Open top cover.



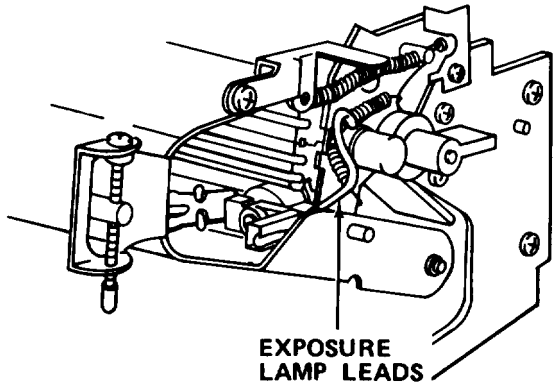
c. Rotate red reflector locking lever up to unlocked position.



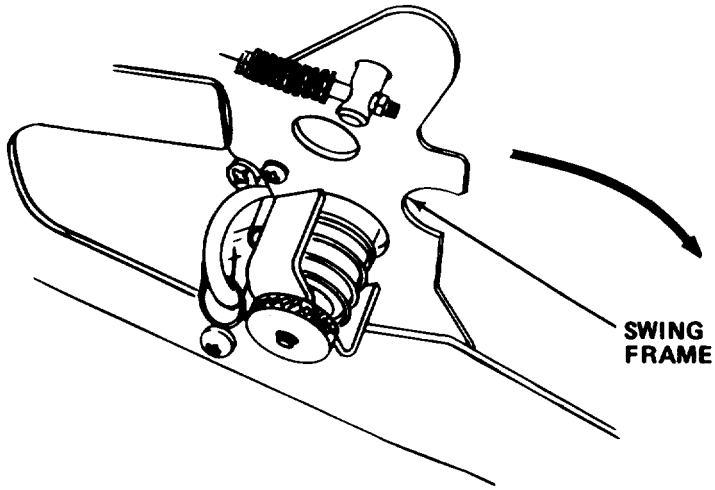
d. Raise two rear latching levers simultaneously, and push them toward back of copy machine.



e. Remove copy belt by sliding it off rollers to left of copy machine.



f. Remove two screws and spring latches.

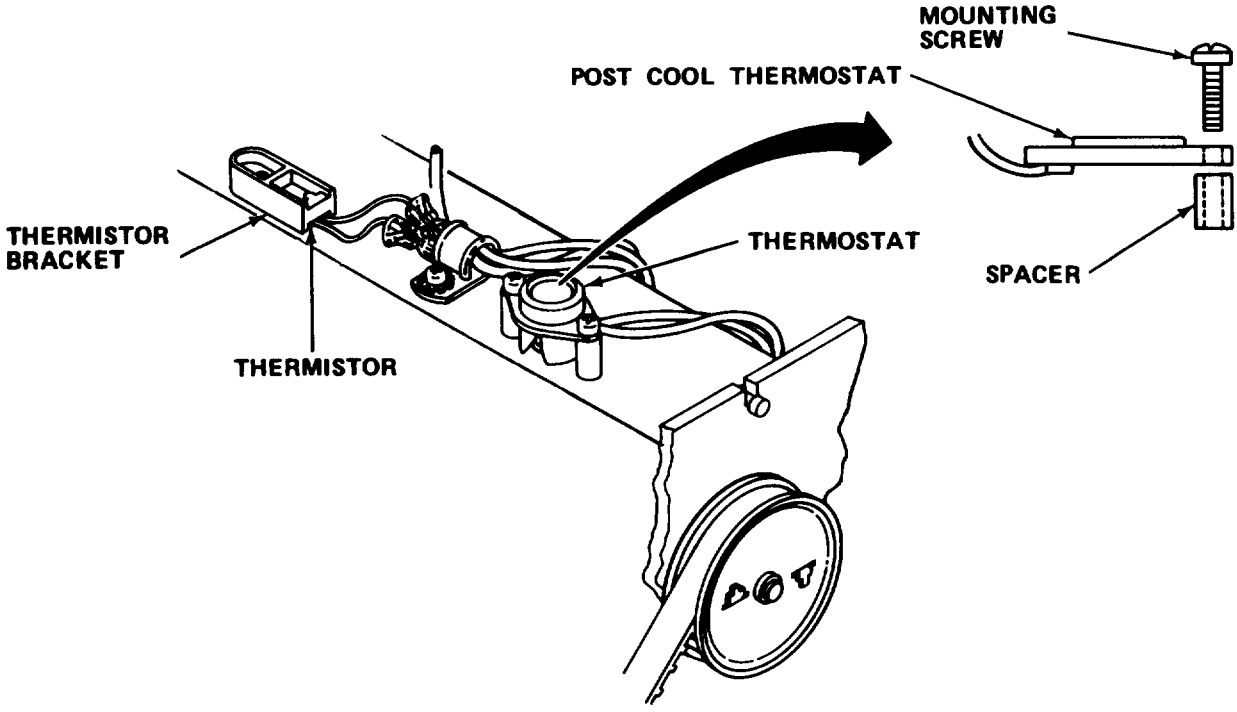


g. Lift right end of lamp and roller assembly up, sliding pin up and out of slot. Then move assembly to the right and remove from copier.

NOTE

Do not remove assembly from copier until exposure lamp leads are disconnected.

h. Disconnect exposure lamp leads.



i. Locate post cool thermostat mounted underneath exposure lamp assembly next to thermistor.

j. Remove two screws and lift defective post cool thermostat clear of spacer. Retain spacer and disconnect wires.

k. Fit new post cool thermostat with spacer underneath. Tighten screws and reconnect wires.

l. Reinstall print roller.

m. Reinstall exposure lamp and reflector assembly into frame. Reconnect exposure lamp leads.

n. Reinstall spring latches and secure with screws.

o. Reinstall copy belt by sliding it over rollers from left to right. Center belt on roller.

p. Pull two rear latching levers forward and push them down.

q. Rotate reflector lock down to locked position.

r. Plug in power cord and check machine for proper operation.

4-16.2 Adjust Drive Belt Tension.

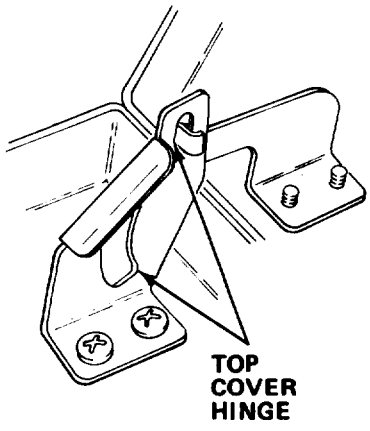
MOS: 83FJ6, Reproduction Equipment Repairer

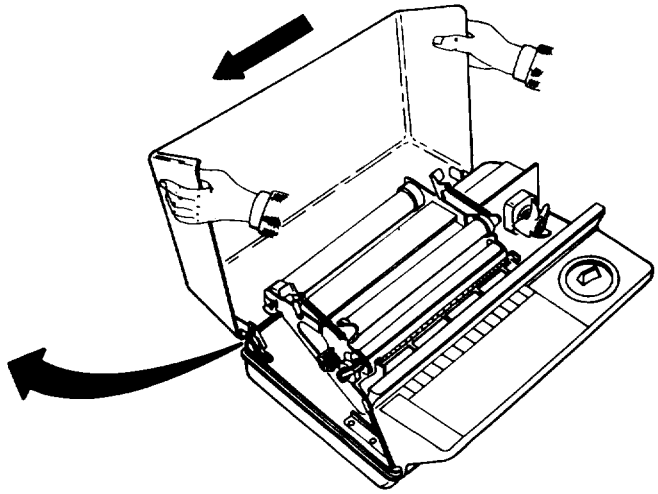
TOOLS: Cross Tip Screwdriver

WARNING

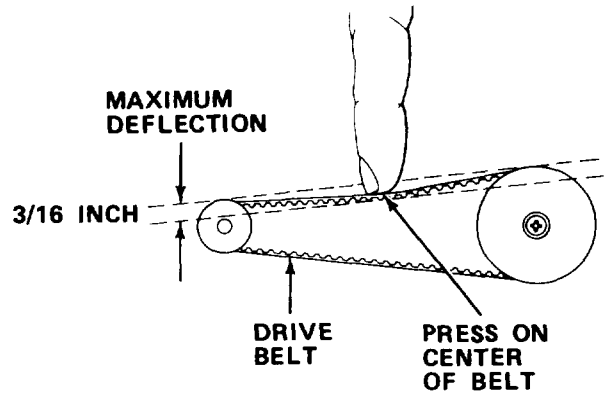
Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Unplug power cord.

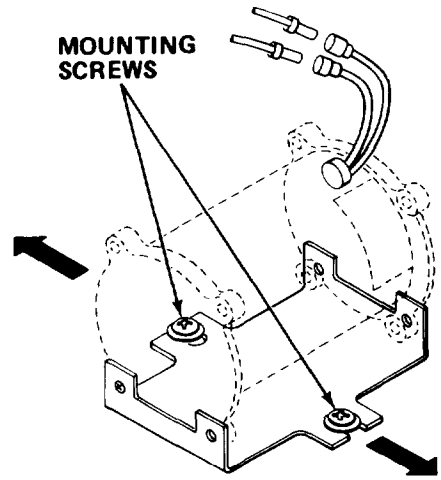




b. Open and remove top cover.



c. Check drive belt tension by applying moderate pressure to center of belt. Belt should deflect a maximum of 3/16 in. (4.7 mm) and minimum of 1/16 in. (1.6 mm).



d. If above condition is not met, loosen two motor mounting screws. If belt is too slack, move motor toward front of copy machine. If belt is too tight, move motor toward rear of copy machine until tension is correct. Retighten motor mounting screws.

e. Reinstall top cover and close.

f. Plug in power cord.

4-16.3 Replace Thermistor.

MOS: 83FJ6, Reproduction Equipment Repairer

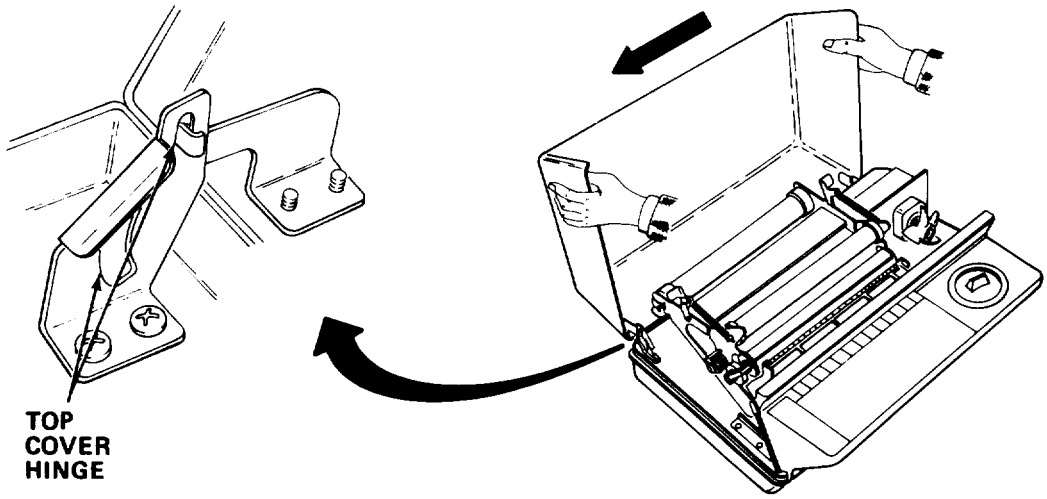
TOOLS: Cross Tip Screwdriver (6 in.)

SUPPLIES: Thermistor (106.7 k ohms)

WARNING

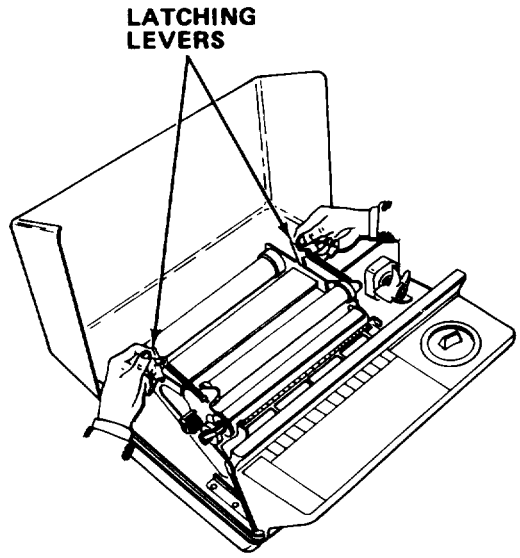
Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing the copy machine.

a. Unplug power cord.

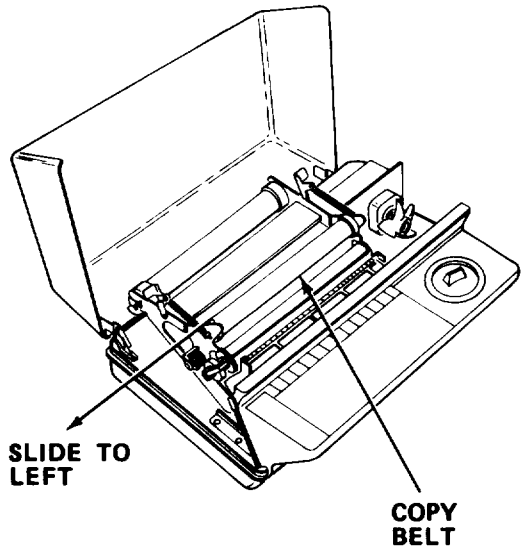


b. Open and remove top cover.

c. Rotate red reflector locking lever up to unlocked position.



d. Raise both latching levers simultaneously, and push them toward back of copy machine.



e. Remove copy belt by sliding it off rollers to left of copy machine.

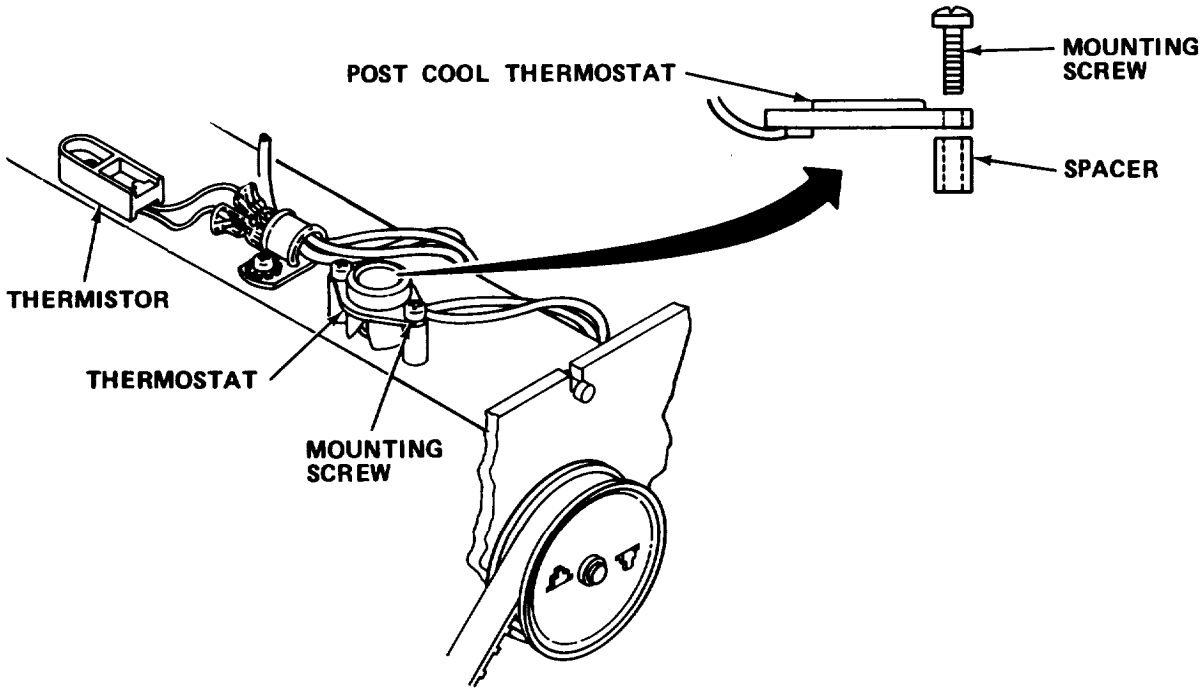
f. Remove two screws and spring latches.

g. Lift right end of lamp and roller assembly up, sliding pin up and out of slot. Then move assembly to the right and remove from copier.

NOTE

Do not remove assembly from copier until exposure lamp leads are disconnected.

h. Disconnect exposure lamp leads.



i. Remove screw and thermistor bracket.

j. Remove screw and cable clamp.

k. Disconnect thermistor leads at connector points.

1. Remove defective thermistor.

m. Install new thermistor into bracket and tighten screw.

n. Connect thermistor leads.

o. Reinstall cable clamp.

p. Reinstall reflector and exposure lamp assembly.

q. Reconnect exposure lamp leads to each end of lamp.

r. Reinstall copy belt by sliding it over rollers from left to right. Center belt on roller.

s. Pull both latching levers forward and push them down.

t. Rotate reflector lock down to locked position.

u. Plug in power cord.

4-16.4 Replace Delay Switch

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Cross Tip Screwdriver (6 in.)

SUPPLIES: Delay Switch

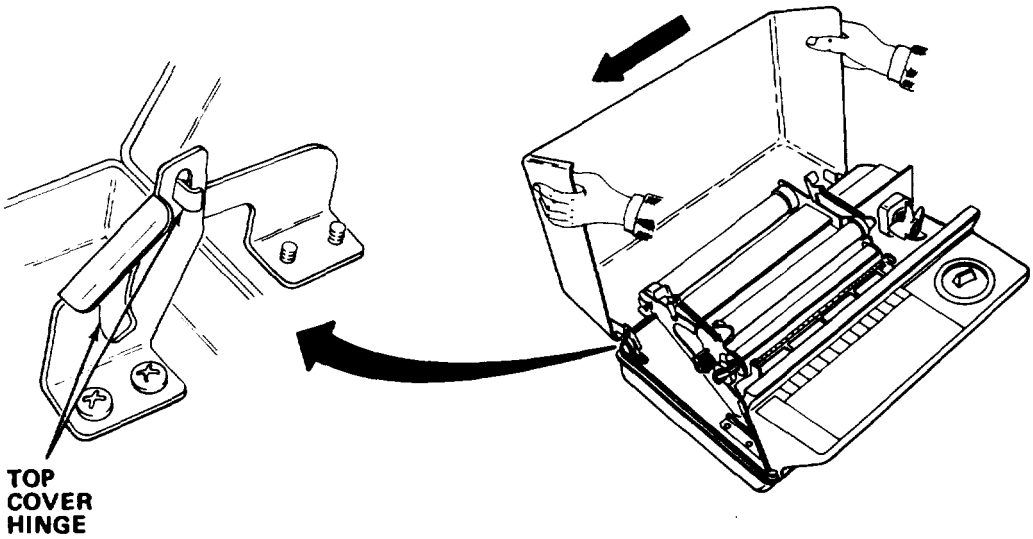
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

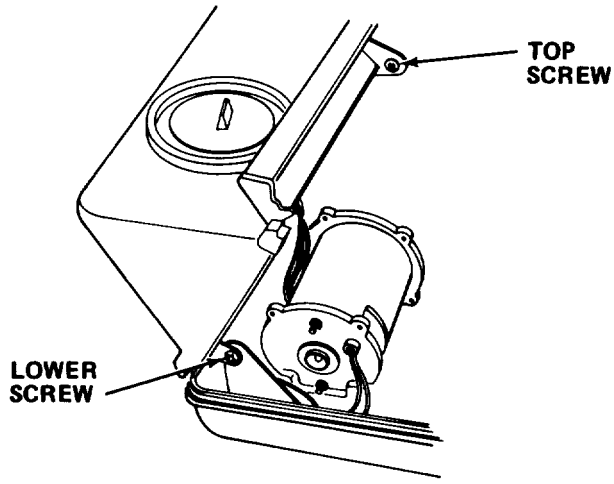
CAUTION

Allow minimum of five minutes for copy machine to cool before opening top cover, or damage to equipment may result.

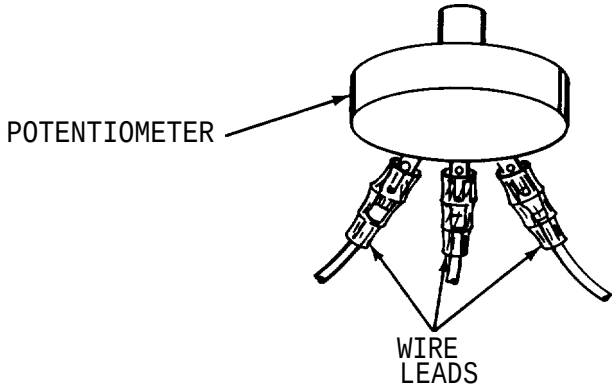
a. Unplug power cord.



b. Open and remove top cover.

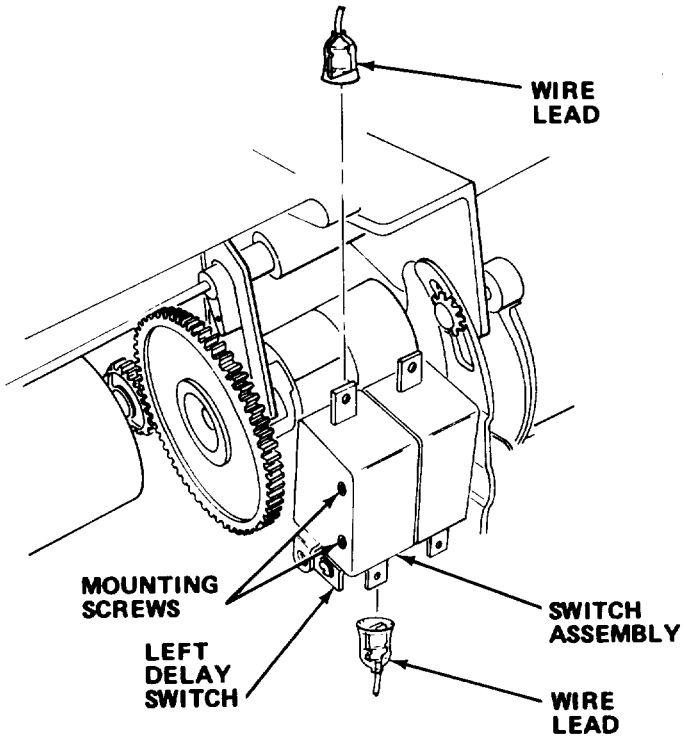


c. Loosen two lower screws and remove top screws at both ends of front console. Lift and move console forward to expose control potentiometer leads.



d. Tag and disconnect three leads from exposure control potentiometer.

e. Remove front console and place in safe location.



f. Remove two screws and delay switch.

g. Disconnect two leads from top and bottom of defective delay switch and remove defective switch.

CAUTION

Be sure cam follower is moved aside while installing new switch or damage could result.

h. Install new delay switch and secure with screws.

i. Reconnect switch leads.

j. Reconnect leads to exposure control potentiometer and reinstall front console.

k. Plug in power cord.

4-16.5 Replace Interlock Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

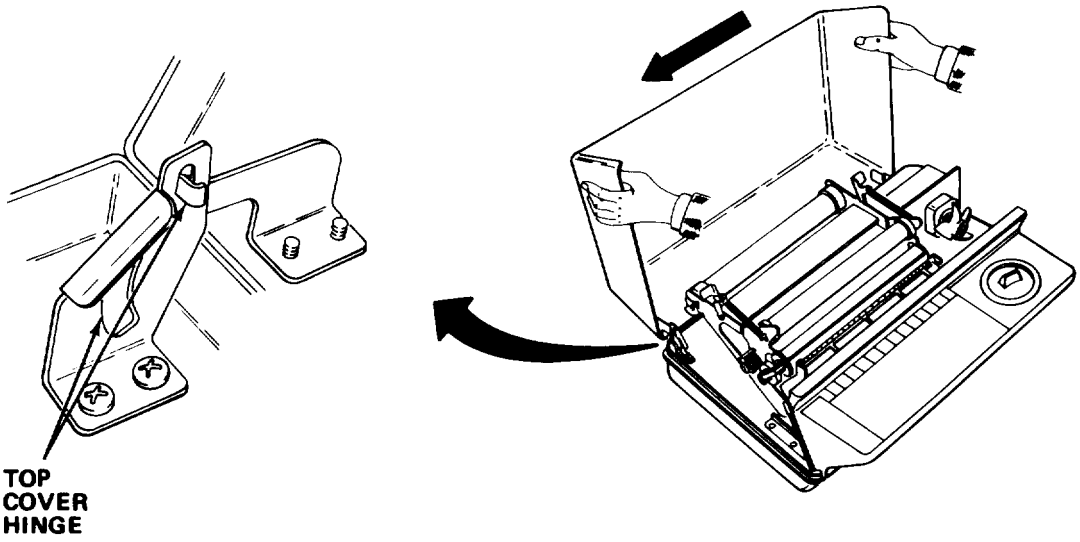
TOOLS: Cross Tip Screwdriver
Flat Tip Screwdriver (6 in.)
Multimeter

SUPPLIES: Interlock Switch

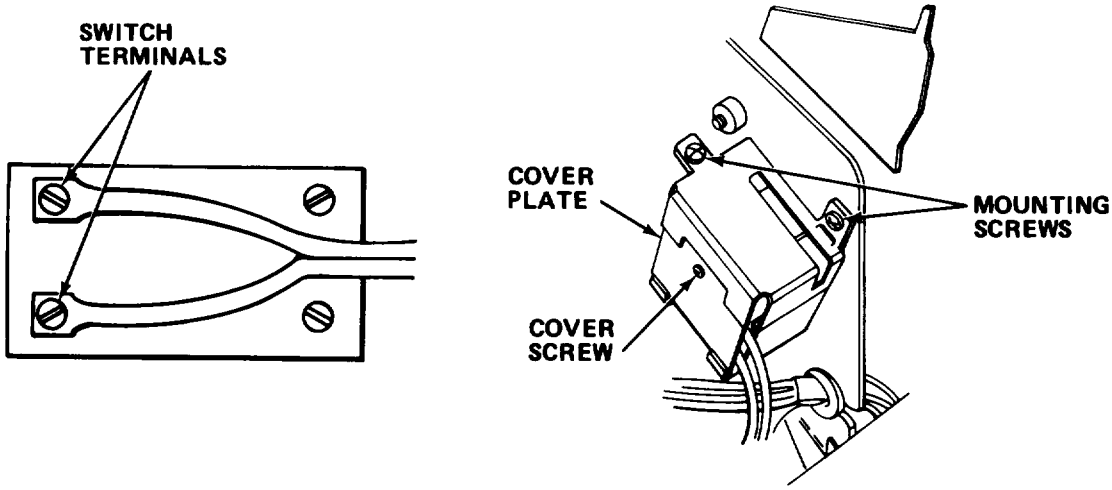
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing the copy machine.

a. Unplug power cord.



b. Open and remove top cover.



c. Remove screw securing cover plate.

d. Remove screw and wiring cover.

e. Tag and disconnect wiring by removing two screws. Pull remaining two wires from clips.

f. Remove defective interlock switch.

g. Reconnect leads to new interlock switch and reinstall wiring cover.

h. Install new interlock switch and secure with mounting screws.

i. Reinstall and close top cover.

j. Plug in power cord.

4-16.6 Replace Paper Trigger Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS : Cross Tip Screwdriver (6 in.)
3/32 in. Hex Head Key Wrench

SUPPLIES: Paper Trigger Switch

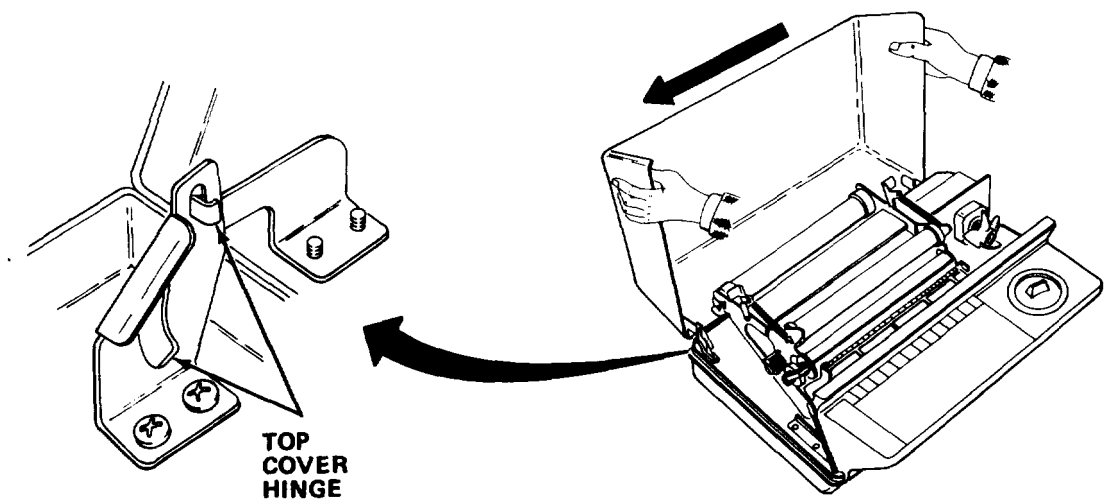
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing the copy machine.

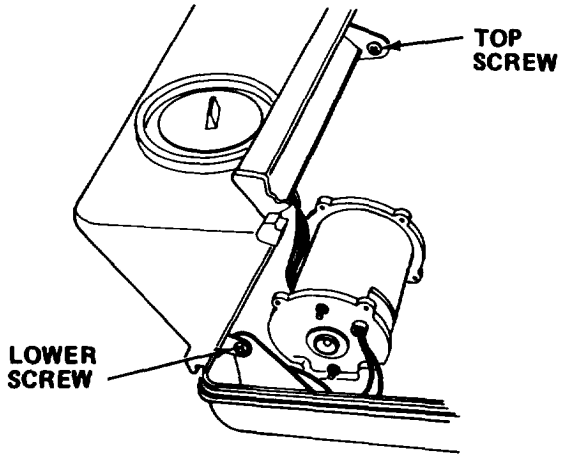
CAUTION

Allow minimum of five minutes for copy machine to cool before opening top cover, or damage to equipment may result.

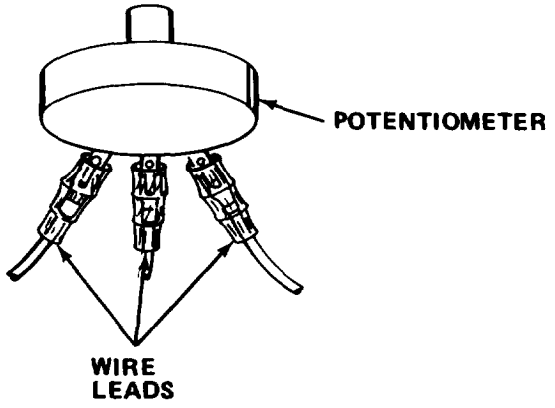
a. Unplug power cord.



b. Open and remove top cover.

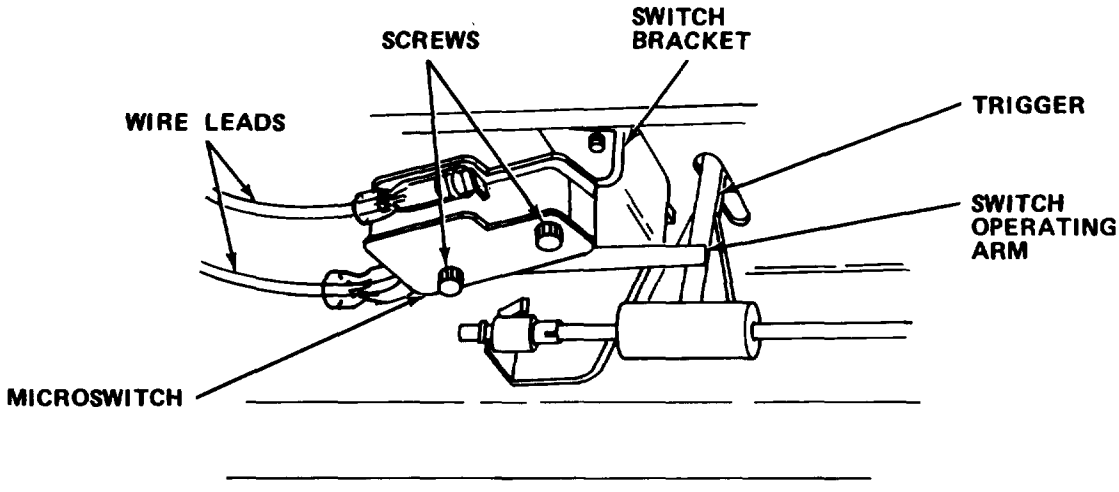


c. Loosen two lower screws and remove top screws at both ends of front console. Lift and move console forward to expose control potentiometer leads.



d. Tag and disconnect three leads from exposure control potentiometer.

e. Remove front console and place in safe location.



f. Disconnect two leads from paper trigger switch.

g. Remove two screws from trigger switch bracket. Note orientation of insulator plates.

h. Remove defective paper trigger switch.

i. Preassemble top insulator plate, new paper trigger switch, bottom insulator plate, and screws.

j. Install new paper trigger switch and plate assembly in position with retaining plate on top of paper trigger switch bracket and tighten screws.

k. Reconnect paper trigger switch leads.

1. Reconnect three leads to exposure control potentiometer.

m. Reinstall front console, and tighten upper and lower screws at both ends.

n. Close top cover.

o. Plug in power cord.

4-16.7 Replace Exposure Control Potentiometer.

MOS: 83FJ6, Reproduction Equipment Repairer

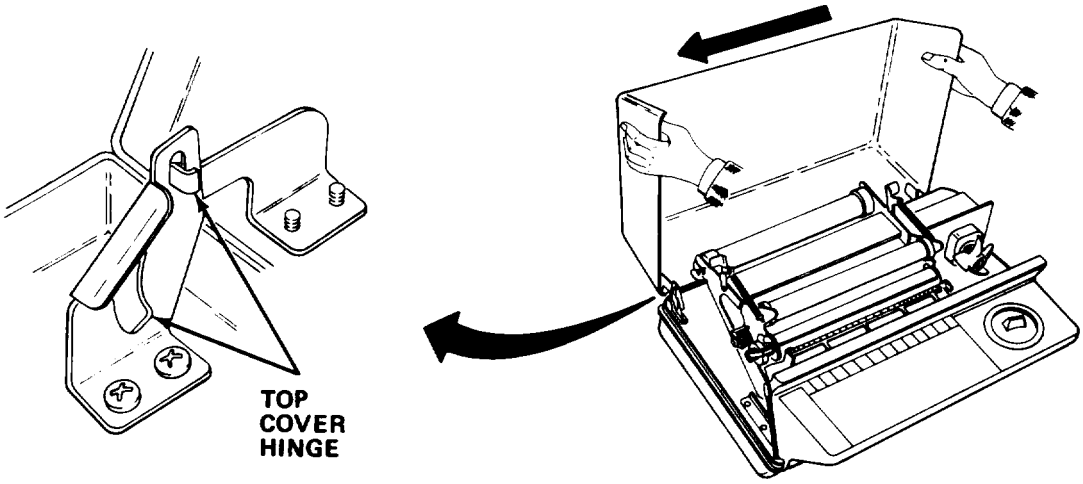
TOOLS: Cross Tip Screwdriver (6 in.)
1/2 in. Combination Wrench

SUPPLIES: Potentiometer

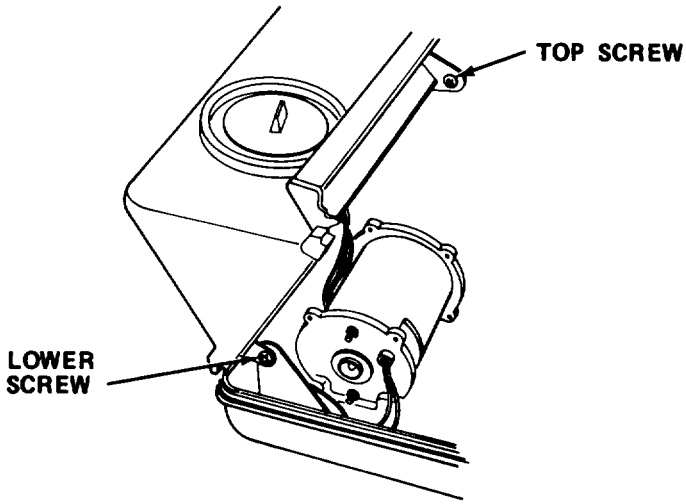
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing the copy machine.

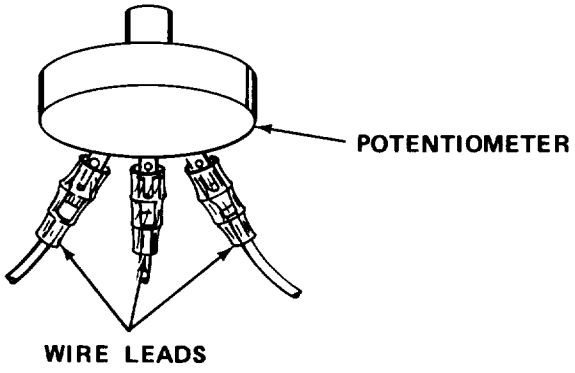
a. Unplug power cord.



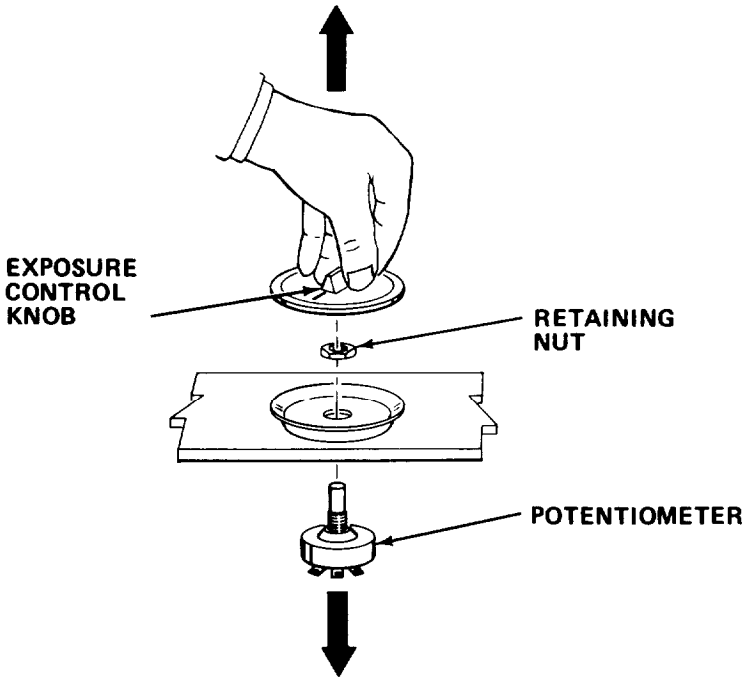
b. Open and remove top cover.



c. Loosen two lower screws. Remove top screws at both ends of front console, and remove console by lifting up and pulling forward.



d. Tag and disconnect three leads from exposure control potentiometer.



e. Remove exposure control knob by pulling straight up.

f. Remove potentiometer retaining nut.

g. Remove defective exposure control potentiometer from inside of console.

h. Install new exposure control potentiometer and secure with retaining nut.

1. Reinstall exposure control knob.

j. Reconnect three leads to exposure control potentiometer.

k. Reinstall console and tighten screws.

1. Close top cover.

m. Plug in power cord.

4-16.8 Replace Printed Circuit Board.

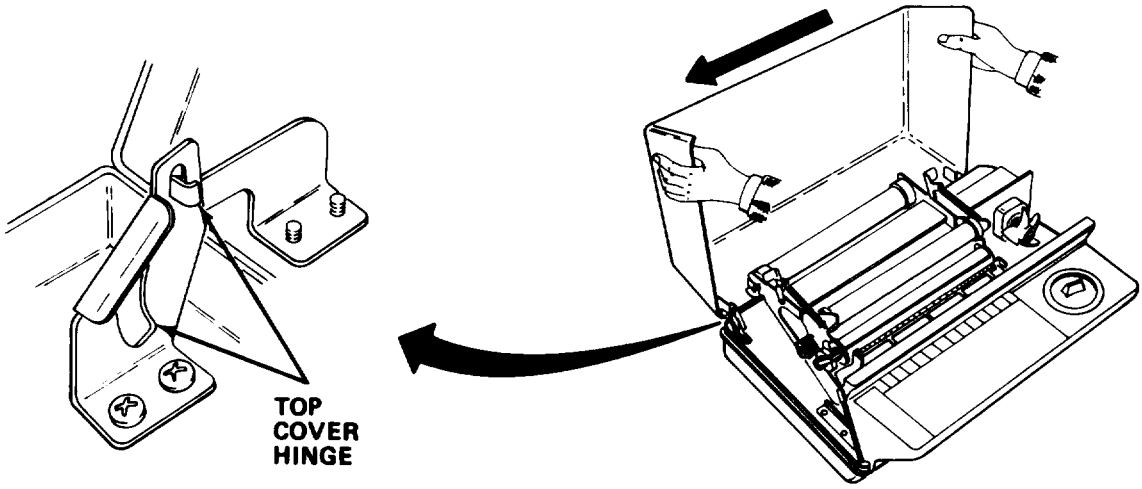
MOS: 83FJ6, Reproduction Equipment Repairer

SUPPLIES: Printed Circuit Board

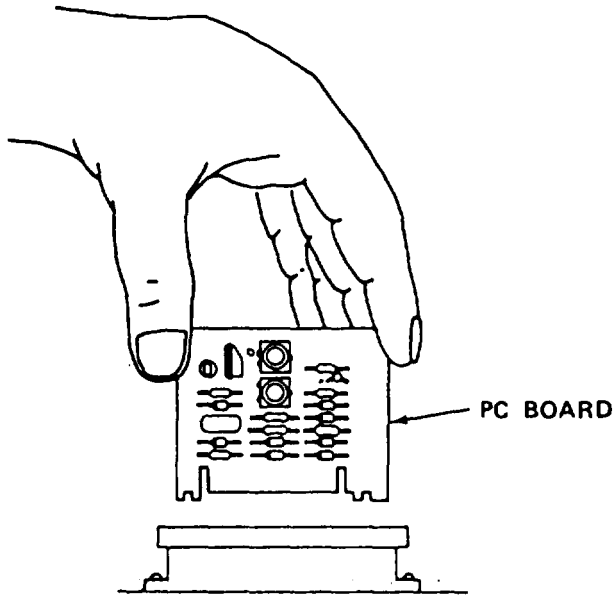
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing copy machine.

a. Unplug power cord.



b. Open and remove top cover.



c. Remove printed circuit board by pulling straight up out of inline socket.

d. Insert new printed circuit board into socket and push downward until properly seated.

e. Close top cover.

f. Plug in power cord.

4-16.9 Replace Blower Motor.

MOS: 83FJ6, Reproduction Equipment Repairer

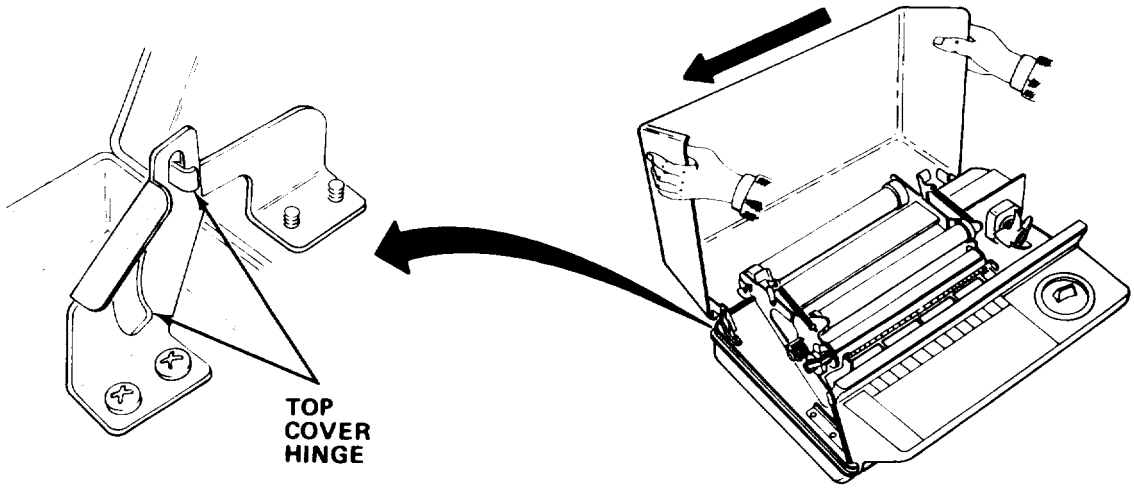
TOOLS: Cross Tip Screwdriver (6 in.)
Flat Tip Screwdriver (6 in.)

SUPPLIES: Blower Motor

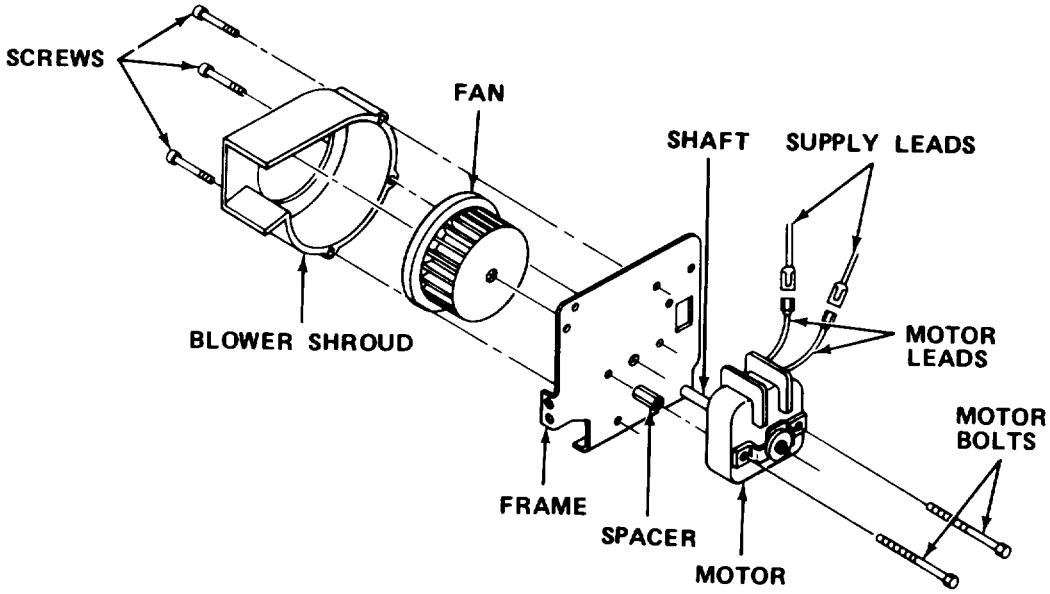
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing the copy machine.

a. Unplug power cord.



b. Open and remove top cover.



c. **Tag** and disconnect **blower supply leads from blower motor leads.**

d. Remove **interlock switch, but do not remove switch** wiring (paragraph 4-16.5).

e. **Remove printed circuit board (paragraph 4-16.8).**

f. Remove three screws and blower shroud.

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PIN:058687-001

g. Pull fan from blower motor shaft.

h. Remove two retaining bolts and defective blower motor.

i. Install new blower motor and secure with two retaining bolts.

j. Push blower fan onto blower motor shaft.

k. Reinstall blower shroud and secure with three screws.

1. Reconnect blower supply leads to motor leads.

m. Reinstall printed circuit board.

n. Reinstall interlock switch.

o. Plug in power cord.

p. Close top cover.

4-16.10 Replace Drive Motor

MOS: 83FJ6, Reproduction Equipment Repairer

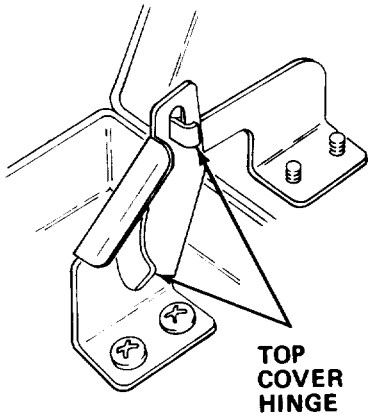
TOOLS: Cross Tip Screwdriver (6 in.)

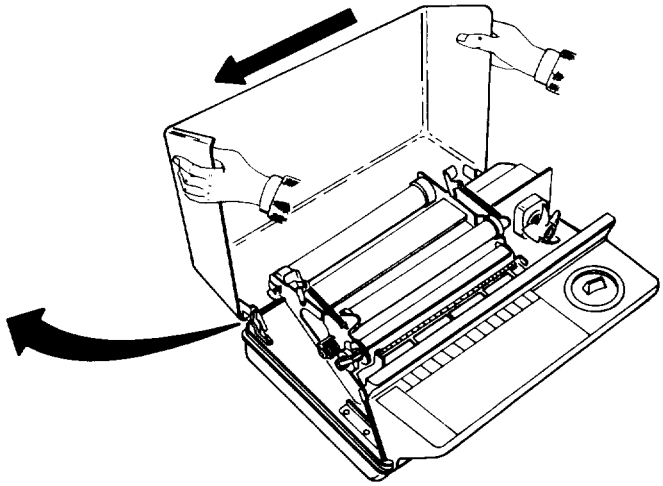
SUPPLIES: Drive Motor

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing the copy machine.

a. Unplug power cord.



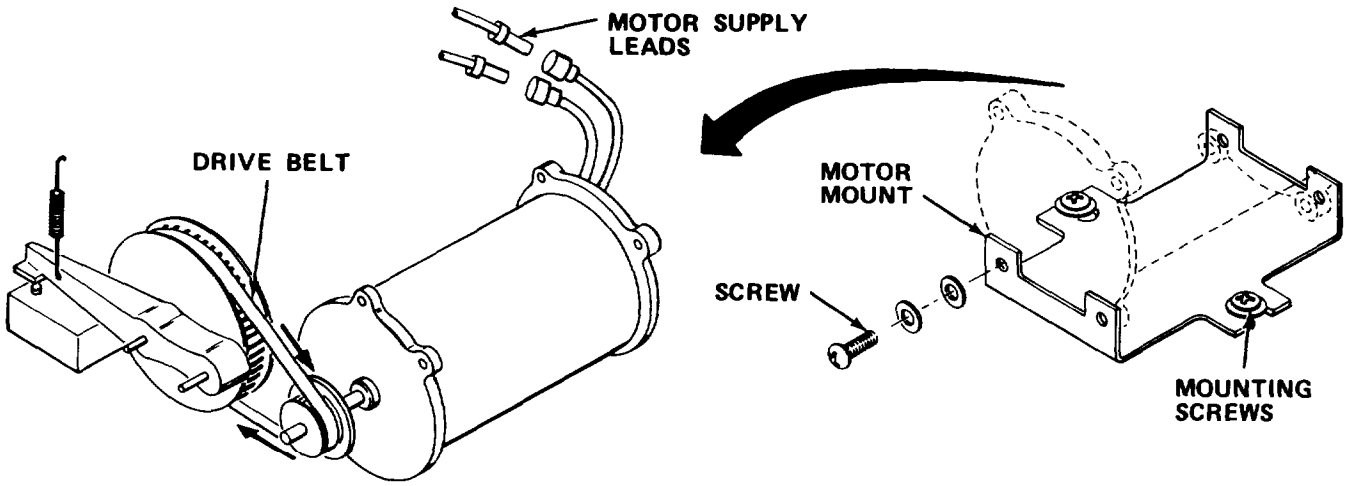


b. Open and remove top cover.

c. Loosen two lower screws and remove top screws at both ends of front console. Lift and move console forward to expose control potentiometer leads.

d. Tag and disconnect leads from exposure control potentiometer.

e. Remove front console.



f. Loosen two motor mounting screws.

g. Slide drive motor and mount toward rear of copy machine.

h. Remove rubber drive belt from drive motor pulley.

i. Disconnect drive motor supply lead connector.

j. Disconnect ground wire.

k. Remove motor mount screws and drive motor assembly.

l. Remove four mounting screws, washers, and defective motor from motor mount.

m. Install new drive motor into motor mount and loosely secure with screws and washers.

NOTE

Belt may be reinstalled when placing assembly into copier, before it is secured with mounting screws.

n. Reinstall drive belt.

o. Reinstall drive motor assembly into copier and secure with **mounting** screws.

p. Reconnect motor supply leads.

q. Reconnect potentiometer leads and reinstall front console.

r. Reinstall and close top cover.

s. Plug in power cord.

4-16.11 Replace Power Transformer.

MOS : 83FJ6, Reproduction Equipment Repairer

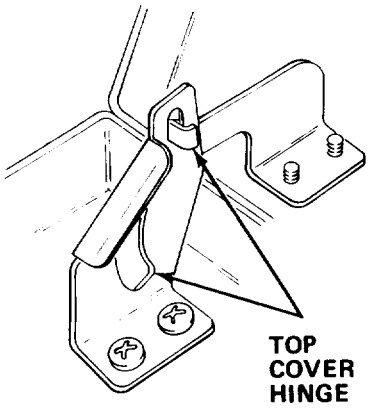
TOOLS : Offset Cross Tip Screwdriver (6 in.)
Cross Tip Screwdriver

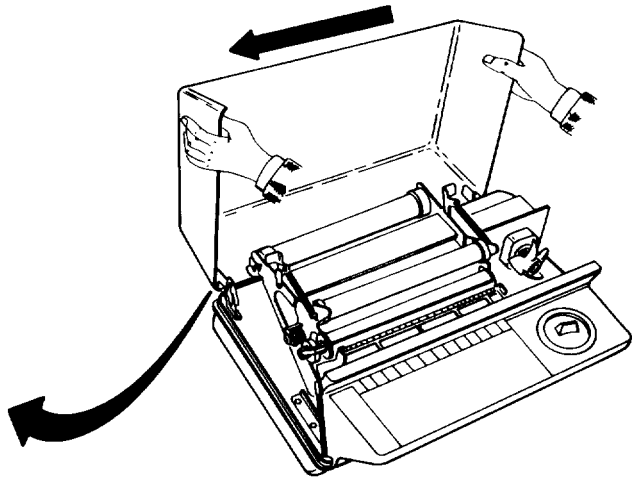
SUPPLIES: Transformer (120-280 V)

WARNING

Death or serious injury may occur from electrical shock unless **power cord is unplugged before servicing the copier.**

a. Unplug power cord.





b. Open and remove top cover.

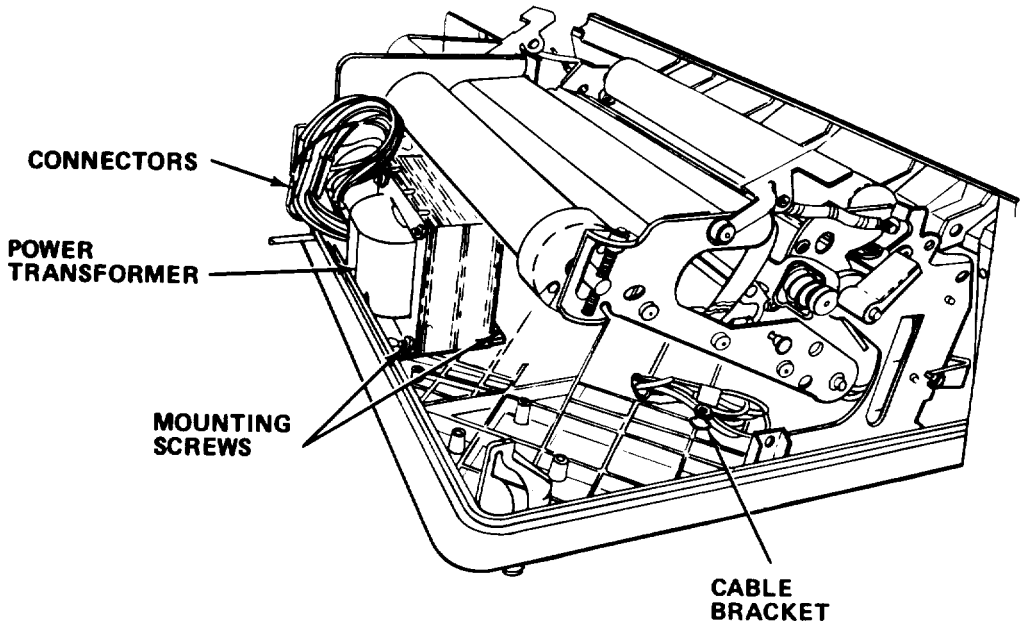
c. Remove cable bracket and move cables out of way of rear transformer mounting screws.

d. Remove two rear mounting screws and washers from transformer base.

e. Loosen two front mounting screws.

f. Tag and disconnect six connectors.

g. Remove defective power transformer.



h. Install new power transformer and tighten rear mounting screws. Reinstall front mounting screws and washers, and tighten securely.

i. Reconnect transformer leads.

j. Reinstall and close top cover.

k. Plug in power cord.

4-16.12 Replace Exposure Lamp.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS : Cross Tip Screwdriver

SUPPLIES: Exposure Lamp
Cheesecloth (Item 7, Appendix E)
Denatured Alcohol (Item 4, **Appendix E)**

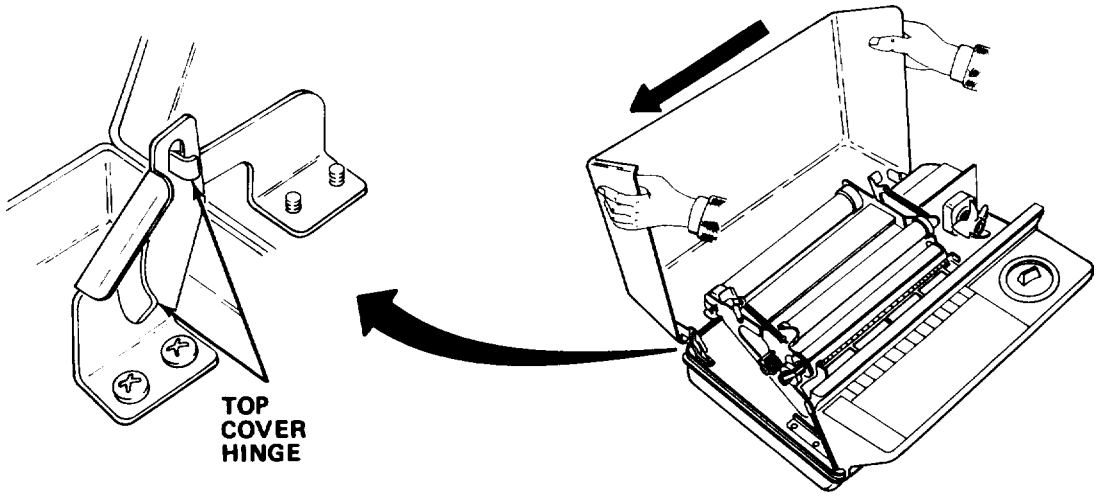
WARNING

Death or serious injury may occur from electrical **shock unless power cord is unplugged before servicing the copier.**

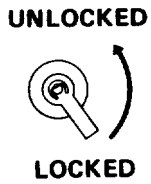
CAUTION

Allow minimum of five minutes for copy machine to cool before opening top cover, or damage to equipment can result.

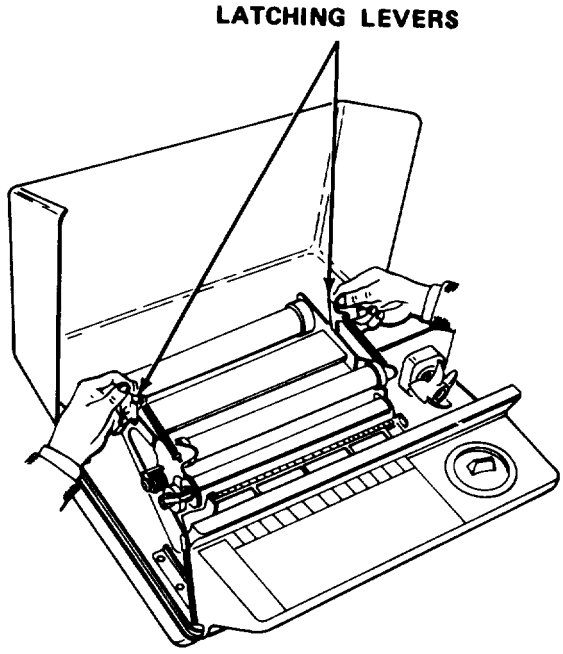
a. Unplug power cord.



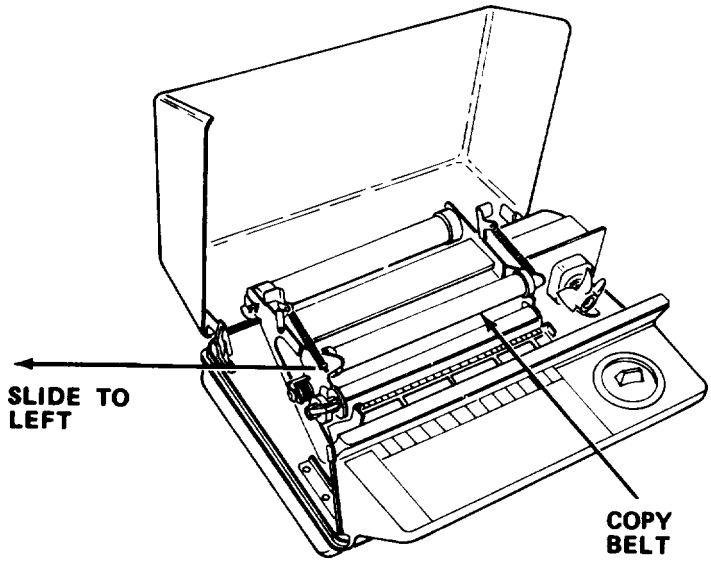
b. Open and remove top cover.



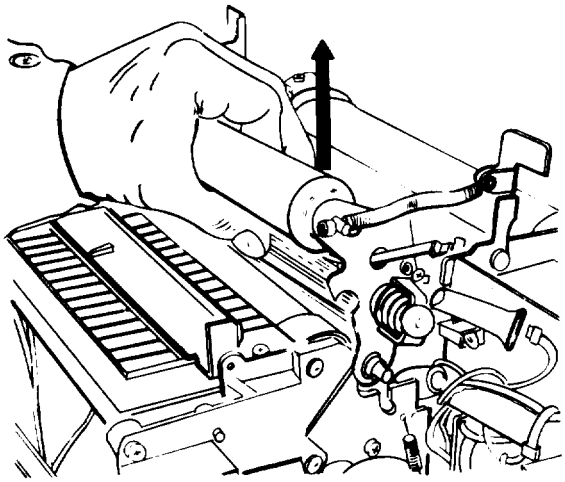
c. Rotate red reflector locking lever up to unlocked position.

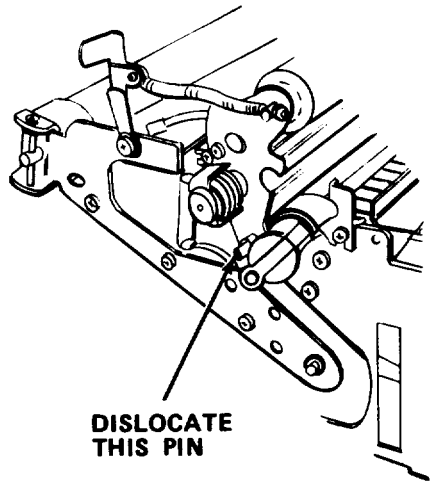


d. Raise rear latching levers simultaneously and push them toward back of copy machine.



e. Remove copy belt by sliding it off rollers to left of copy machine.





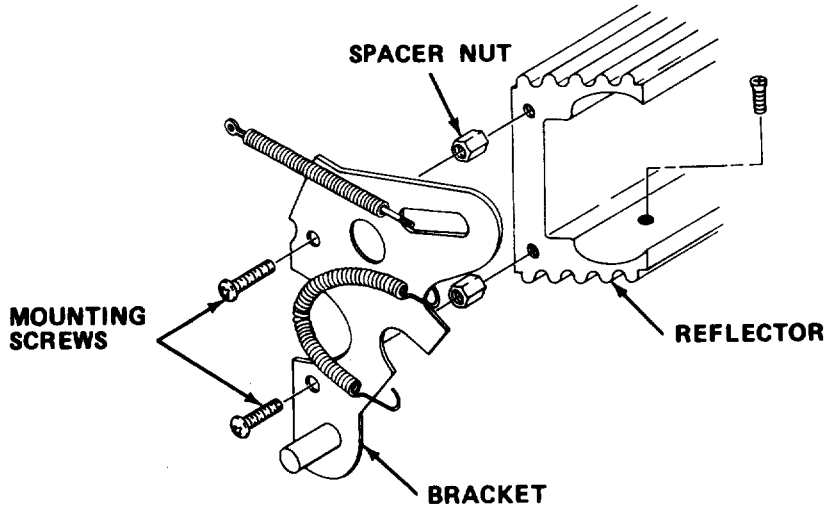
f. Remove two screws and spring latches.

g. Lift right end of lamp and roller assembly up, sliding pin up and out of slot. Then move assembly right and remove from copier.

NOTE

Do not remove assembly from copier until exposure lamp leads are disconnected.

h. Disconnect exposure lamp leads.



i. **Remove springs, two bracket retaining** screws and bracket at each end **of reflector.**

CAUTION

Do not touch exposure lamp with bare fingers. Fingerprints on glass will cause premature failure of exposure lamp. If inadvertently touched, clean it with cloth moistened with alcohol and then dry.

j. Remove defective exposure lamp from reflector.

k. Clean reflector with cheesecloth moistened with denatured alcohol.

l. Install new exposure lamp in reflector.

m. Reinstall brackets and secure with screws.

n. Reinstall springs.

o. Reinstall exposure lamp and reflector assembly into frame.

p. Reconnect spring latches and secure with screws.

q. Reconnect exposure lamp leads.

r. Reinstall copy belt by sliding it over rollers from left to right. Center belt on rollers.

s. Pull both latching levers forward and push them down.

t. Rotate reflector locking lever down to locked position.

u. Reinstall and close top cover.

v. Plug in power cord.

4-17. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

There are no direct/general support maintenance procedures assigned for this equipment.

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By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

DONALD J. DELANDRO
Brigadier General, United States Army
The Adjutant General

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COA, 3d ENGINEER BN
FT. LEAVENWORTH, KS 66027

DATE SENT

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TM 5-6675-324-14-1	3 Sep 85	Topographic Support System Information Section

BE EXACT. . . PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
6	2-1 a			In line 6 of paragraph 2-1a the manual states the engine has 6 Cylinders. The engine on my set only has 4 Cylinders. Change the manual to show 4 Cylinders.
B1		4-3		Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please correct one or the other.
125	line 20			I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered, so the NSN is wrong. Please give me a good NSN

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C