
TECHNICAL MANUAL

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

**TOPOGRAPHIC SUPPORT SYSTEM
PHOTOMECHANICAL SECTION
MODEL ADC-TSS-18
NSN 3610-01-105-1556**

**HEADQUARTERS, DEPARTMENT OF THE ARMY
29 SEPTEMBER 1986**

CHANGE

NO. 3

HEADQUARTERS
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WASHINGTON, D.C., 15 April 1991

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

**TOPOGRAPHIC SUPPORT SYSTEM
PHOTOMECHANICAL SECTION, MODEL ADC-TSS-18
NSN: 3610-01-105-1556**

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Operator's Organizational, Direct
Support And General Support
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**TOPOGRAPHIC SUPPORT SYSTEM
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Operator's, Organizational, Direct
Support and General Support
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WARNING

DEATH OR SERIOUS INJURY

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.

Fumes and chemicals used may result in DEATH or BLINDNESS if personnel do not operate equipment with proper ventilation.

Chemicals used in reproduction and photographic processes may result in BLINDNESS if personnel do not use eye protection when required.

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

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

WARNING

CAUSTIC CHEMICALS IN FILM PROCESSOR

Use rubber gloves to avoid serious burns.

If chemicals get on your skin or clothes, wash immediately with water.

If chemicals get in your eyes, wash them with plenty of water and get medical help immediately.

b

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT

AND

GENERAL SUPPORT MAINTENANCE MANUAL

TOPOGRAPHIC SUPPORT SYSTEM

PHOTOMECHANICAL SECTION, MODEL ADC-TSS-18

NSN: 3610-01-105-1556

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

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

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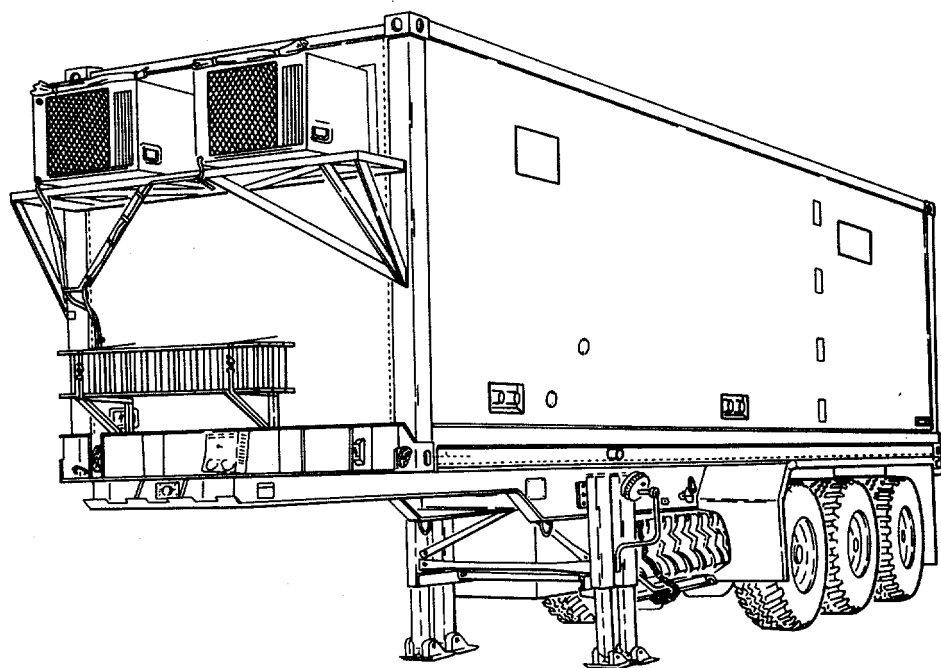
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CHAPTER 1

PHOTOMECHANICAL SECTION

Section I. INTRODUCTION

1-1. GENERAL INFORMATION.

1-1.1 Scope. This manual contains operating and maintenance instructions for the ADC-TSS-18, Photomechanical Section, Topographic Support System (TSS). The purpose of the Photomechanical Section is to provide duplicate film negatives, positives, or reproducible material, color proofs, processed scribing material and peel coats. The trailer chassis is covered in TM 5-2330-305-14, Operator's, Organizational, Direct Support and General Support Maintenance Manual, Topographic Support System, Chassis, Semitrailer, ISO Container Transporter. Repair parts and special tools are listed in TM 5-3610-285-24P, Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List, Photomechanical Section, Topographic Support System. Lubrication instructions are contained in LO 5-3610-285-12, Lubrication Order, Photomechanical Section, Topographic Support System. All authorized equipment, supplies, and their locations for transport are shown in Location and Description of Major Components.

1-1.2 Purpose of Equipment. To provide a transportable facility for production of duplicate film negatives, positives, or reproducible material, color proofs, processed scribing material and peel coats.

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 Report Equipment Improvements (EIR's). If the Photomechanical 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, ATM: AMSTR-MOF, 4300 Goodfellow Boulevard, 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 this 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.

1-1.7 Hand Receipt (-HR) Manual. This manual has a companion document with a TM number followed by "-HR" (which stands for Hand Receipt). TM 5-3610-285-14-HR consists of preprinted hand receipts (DA Form 2062) that list end item-related equipment (i. e. , Components of End Item, Basic Issue Items, and Additional Authorization Lists) for which you must account. As an aid to property accountability, additional -HR manuals may be requisitioned from the following source in accordance with procedures in Chapter 3, AR 310-2: The U. S. Army Adjutant General Publications Center, 2800 Eastern Boulevard, Baltimore, MD 21220.

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 one-half division on level indicator, 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.

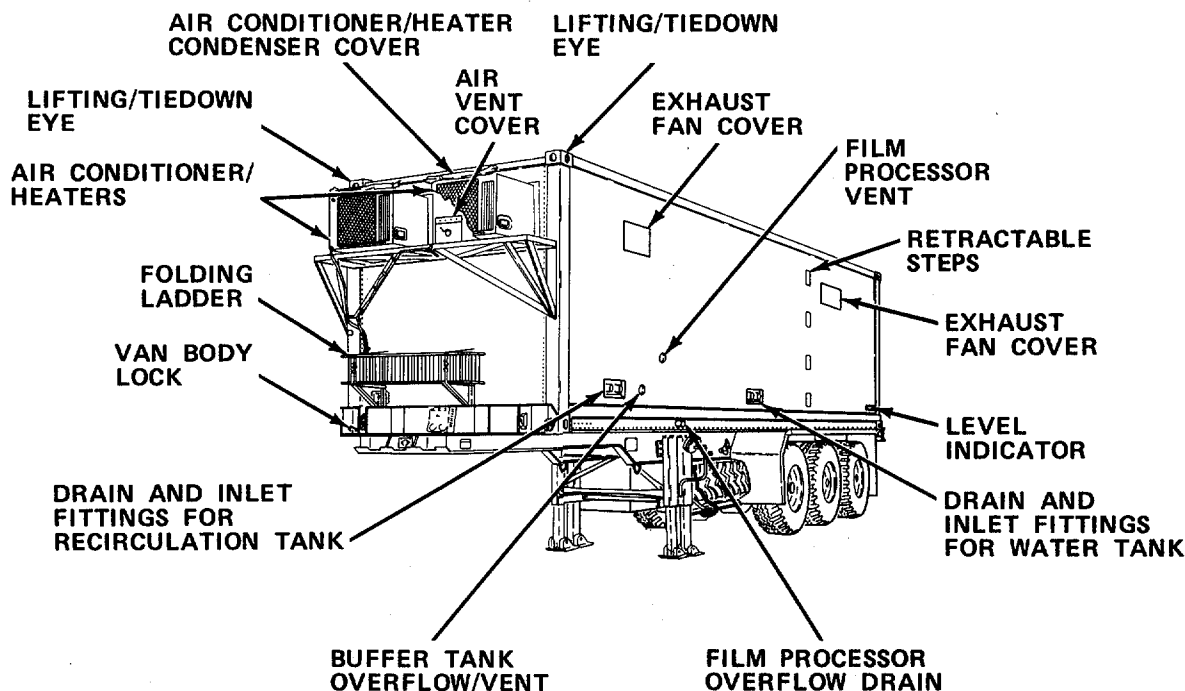
c. During site selection, avoid overhead power transmission lines to prevent danger from electric shock or electromagnetic interference.

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. Cover air conditioner/heater condensers to prevent water/air entering air conditioner/heater units when in transport or storage.

AIR VENT COVER. Covers air vent opening.

EXHAUST FAN COVER. Covers exhaust fan opening.

FILM PROCESSOR VENT. Exhausts excess heat from film processor.

RETRACTABLE STEPS. Provide access to roof.

LEVEL INDICATORS. Indicate van body inclination.

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

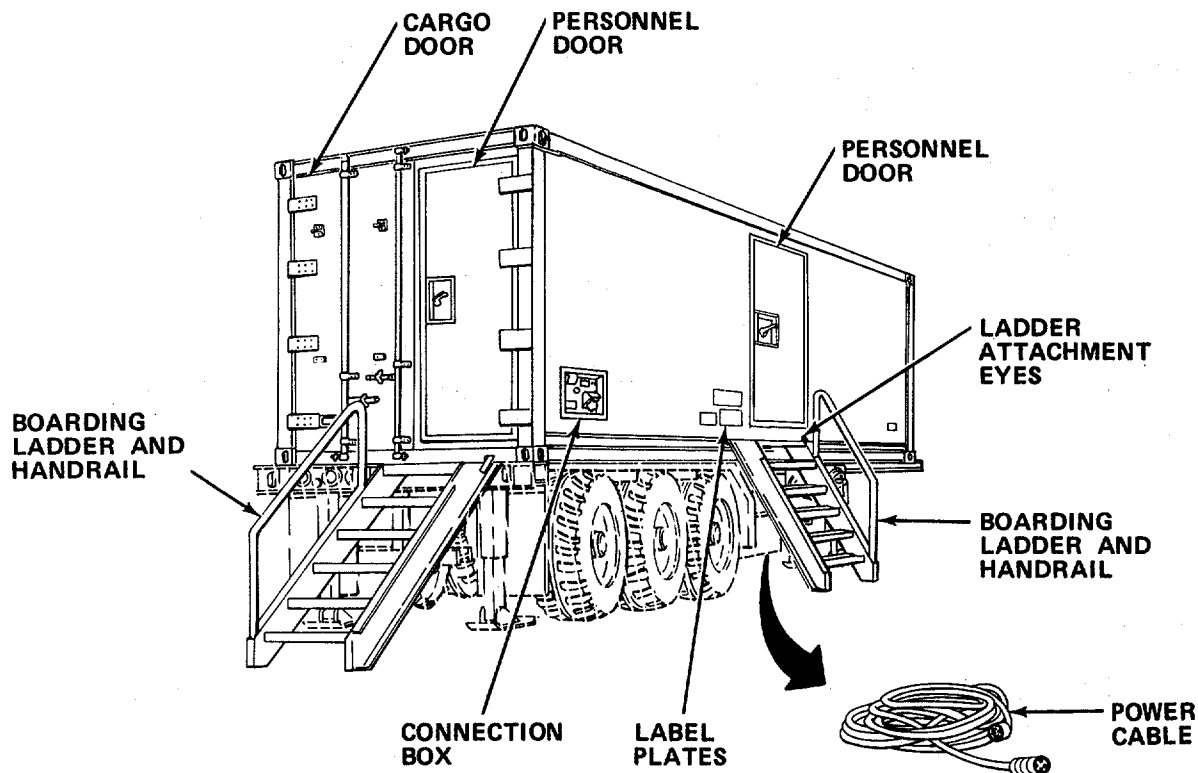
DRAIN AND INLET FITTINGS FOR WATER TANK. Fittings to fill and drain water tank.

FILM PROCESSOR OVERFLOW DRAIN. Provides drain for liquids collected in drain pan beneath film processor.

BUFFER TANK OVERFLOW/VENT. Provides both vent and drainage for overflow from buffer tank.

DRAIN AND INLET FITTINGS FOR RECIRCULATION TANK. Fittings to fill and drain recirculation tank.

b. Curbside Exterior.



CARGO DOOR. Access for equipment removal/installation.

PERSONNEL DOORS. Doors are 26.75 in. (67.9 cm) wide by 70.5 in. (179.1 cm) high.

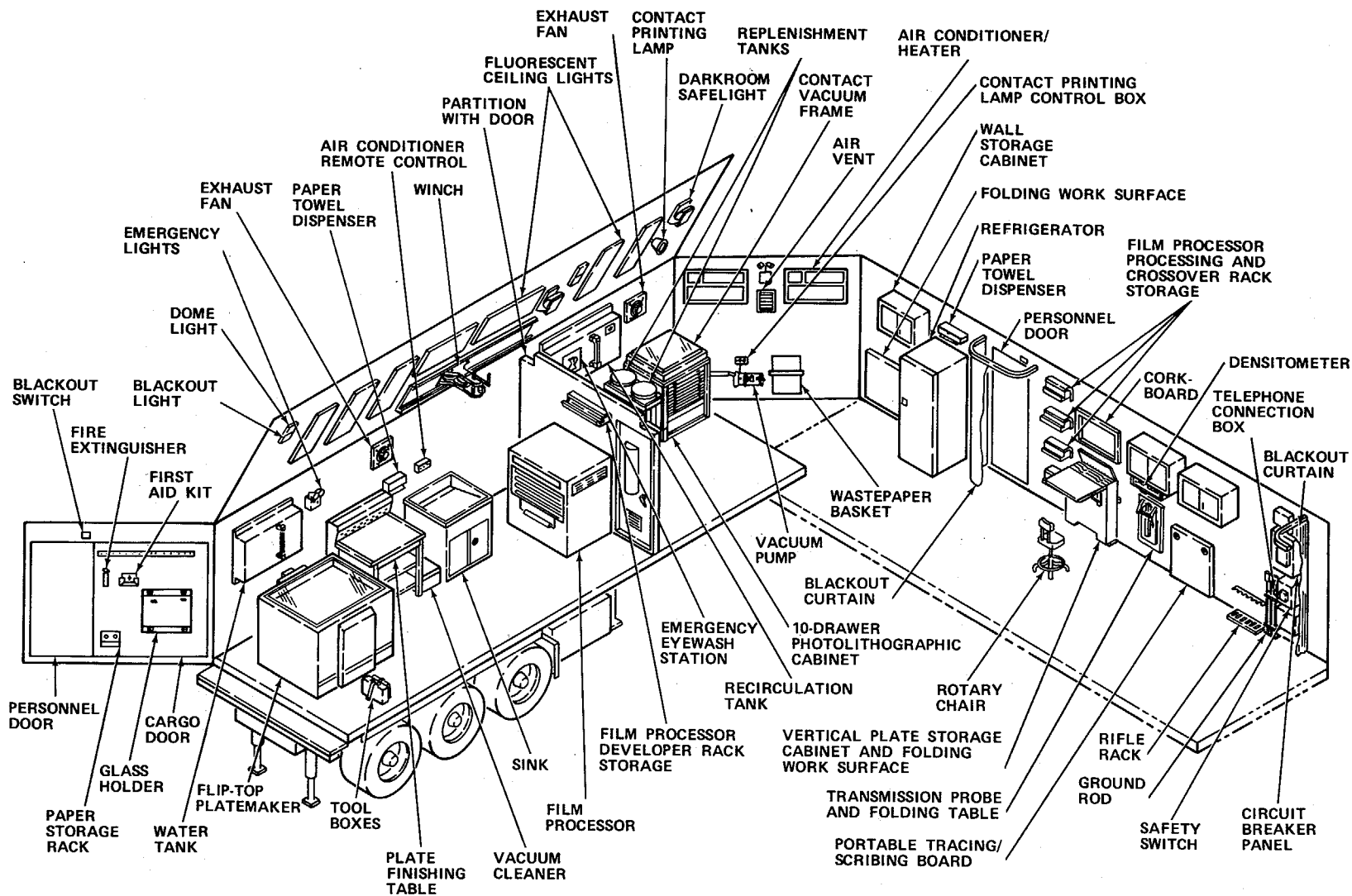
LABEL PLATES. Provide weight/moment data.

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 van body.



PERSONNEL DOOR. Provides access to van. Weatherproof, fitted with blackout switch.

BLACKOUT SWITCHES. Turn ceiling lights off when activated.

FIRE EXTINGUISHER. Provides fire fighting capability. Dry chemical.

FIRST AID KIT. Provides first aid supplies.

CARGO DOOR. Provides access for equipment removal/installation.

GLASS HOLDER. Provides storage for glass shield for flip-top platemaker.

PAPER STORAGE RACK. Provides storage for kraft paper roll.

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

EMERGENCY LIGHTS. Provide emergency illumination. Battery powered lighting activated by power failure.

PAPER TOWEL DISPENSER. Holds and dispenses paper towels.

AIR CONDITIONER/HEATER REMOTE CONTROL. Provides means to operate air conditioner/heater from a remote location.

WINCH. Provides a means of lifting and moving developer rack to and from film processor.

PARTITION WITH DOOR. Divides section to permit darkroom operation in one area.

EMERGENCY EYEWASH STATION. Provides first aid for chemicals splashed in eyes.

FLUORESCENT CEILING LIGHTS. Provide illumination. White, two-level (high/low) overhead lights.

EXHAUST FANS. Provide ventilation. Fitted with lightproof louvers and weatherproof covers.

REPLENISHMENT TANKS. Replenish fixer and developer in film processor system.

CONTACT VACUUM FRAME. Exposes proofs and produces contact and duplicate prints.

CONTACT PRINTING LAMP. Provides controlled light source for use with contact vacuum frame.

DARKROOM SAFELIGHT. Provides source of illumination using filtered light that will not react with photosensitive material in use.

CONTACT VACUUM FRAME. Used to hold sensitized material flat for exposure.

AIR VENT. Permits filtered make-up air to enter van body.

AIR CONDITIONERS/HEATERS. Provide internal environmental control.

CONTACT PRINTING LAMP CONTROL BOX. Controls operation of contact printing lamp.

WALL STORAGE CABINET. Provides additional storage.

FOLDING WORK SURFACE. For accessory equipment and miscellaneous tasks.

REFRIGERATOR. Provides temperature controlled storage for photolithographic chemicals/supplies.

PERSONNEL DOOR. Provides entrance and exit to and from van. Weatherproof, fitted with blackout switch.

PROCESSING AND CROSSOVER RACK STORAGE. Provides secure storage for processor racks during transport mode.

CORKBOARD. Used for posting information.

VERTICAL PLATE STORAGE CABINET AND FOLDING WORK SURFACE. Provides storage for lithographic plates and additional work surface.

DENSITOMETER. To measure color and black and white densities.

TRANSMISSION PROBE. Collects diffused light that passes through a sample and inputs it to densitometer.

TELEPHONE CONNECTION BOX. Communication terminal.

BLACKOUT CURTAINS. Provide lightproofing.

CIRCUIT BREAKER PANEL. Circuit breakers with voltage and phase test indicator.

SAFETY SWITCH. Main power safety disconnect switch.

GROUND ROD. Provides electrical ground for section.

RIFLE RACK. Provides weapon storage.

PORTABLE TRACING/SCRIBING BOARD. Provides portable drawing surface.

ROTARY CHAIR. Provides adjustable height chair.

WASTEPAPER BASKET. Refuse container.

VACUUM PUMP. Provides vacuum for contact vacuum frame.

10-DRAWER PHOTOLITHOGRAPHIC SUPPLY STORAGE CABINET. Provides additional storage for photolithographic supplies.

RECIRCULATION TANK. A temperature controlled tank containing wash water for wash system of processor.

FILM PROCESSOR DEVELOPER RACK STORAGE. Provides secure storage for processor developer rack during transport mode.

FILM PROCESSOR. Used to process exposed photographic film.

SINK. Used to wash and develop photographic material.

VACUUM CLEANER. Provides means of properly cleaning equipment.

PLATE FINISHING TABLE. Provides work surface for drying and completion of plate process.

TOOL BOXES. Provide tool storage.

FLIP-TOP PLATEMAKER. Exposure device for the photolithographic process.

WATER TANK. Provides storage for photomechanical water supply.

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

Dimensions

Length 29.92 ft (9.12 m)

Width 8 ft (2.44 m)

Height 8 ft (2.44 m)

Cubage 2038 ft³ (57.7 m³)

Connections

Telephones One telephone (three-post connection)

Power 21.7 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 ft³/min (8.18 m³/min)

Air Vent 289 ft³/min (8.18 m³/min)

Weight

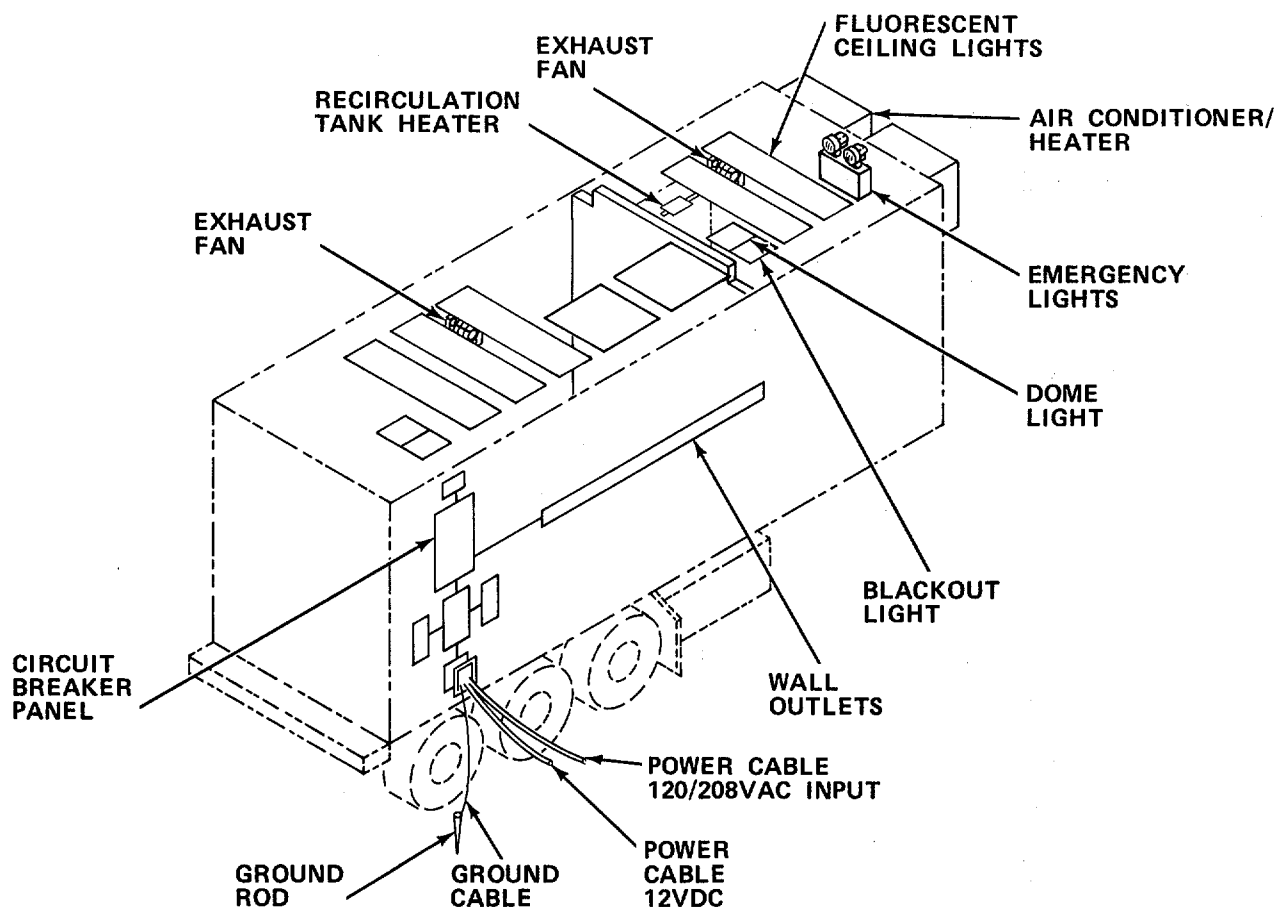
Gross (Container and Chassis) 25,200 lbs (11,430.72 kg)

Tare (Container Only) 13,565 lbs (6153.08 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 CABLE. Used with ground rod.

GROUND ROD. Used to ground van body.

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

EXHAUST FANS. Plug-in fans, separately fused.

RECIRCULATION TANK HEATER. Warms recirculating tank water to preset temperature.

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

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

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

EMERGENCY LIGHTS. Battery powered. Activated by power loss.

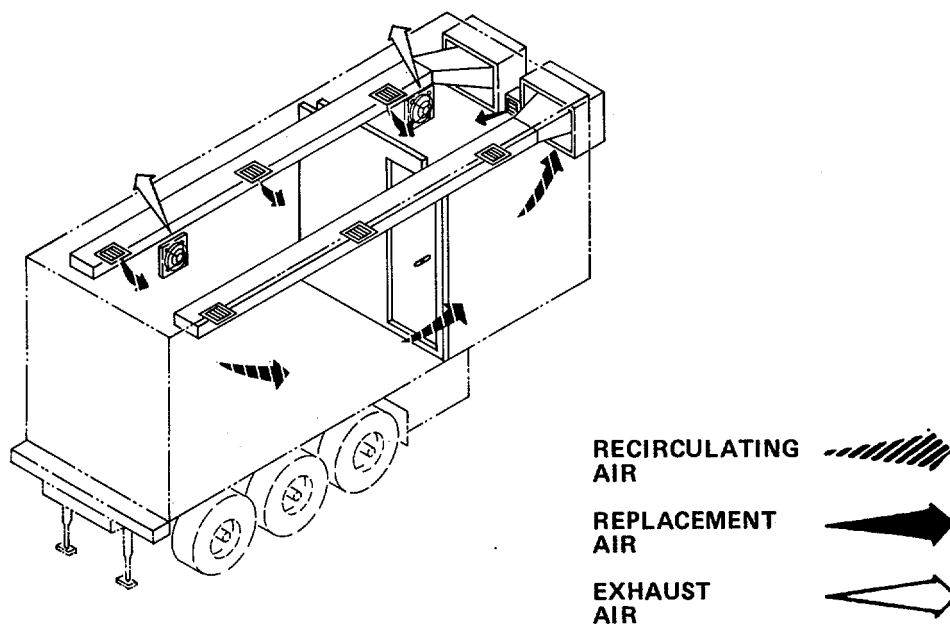
BLACKOUT LIGHTS. Red-lensed, 12 V ac lights actuated when blackout switch operates.

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

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

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

1-3.4 Ventilation System.



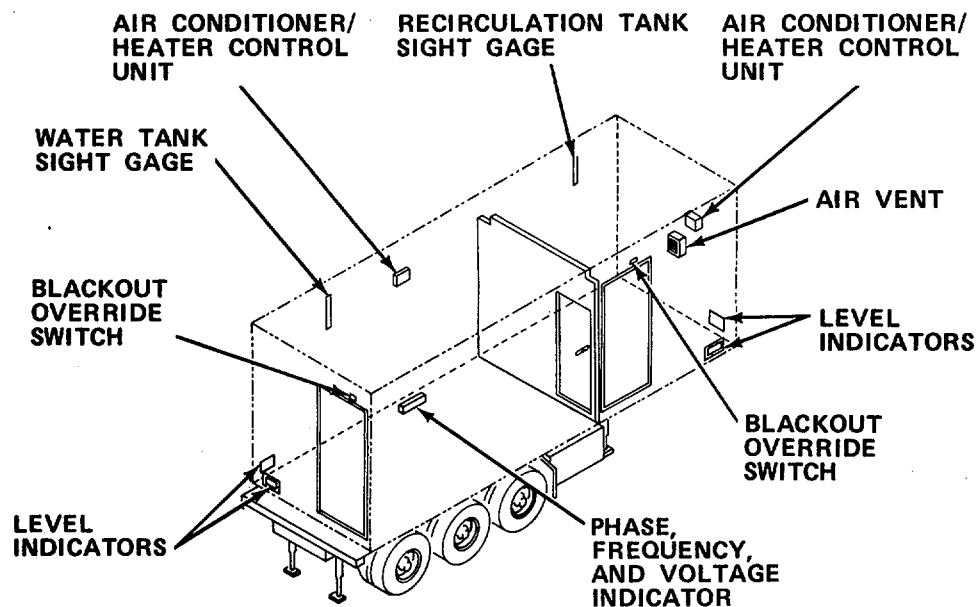
Exhaust fan exhausts air. Replacement air flows into the section through the air vent filter. Recirculating air is filtered as it enters the air conditioners/heaters. From the air conditioners/heaters, it flows through the ceiling vents and into the section.

NOTE

Detailed description of air conditioner/heater operation is contained in TM 54120-367-14, 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 (5274 W).

Section II. OPERATING INSTRUCTIONS

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



CONTROL OR INDICATOR

FUNCTION

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.
Water Tank Sight Gage	Indicates level of water in water tank.
Recirculation Tank Sight Gage	Indicates level of water in recirculation tank.
Blackout Override Switches	Bypass blackout switches.
Blackout Switches	Turn off lights when doors are opened.
Phase, Frequency, and Voltage Indicator	Monitors electrical power phase, frequency, and voltage.
Level Indicators	Aid in leveling van body, ensuring proper equipment operation.

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 column. 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:

<u>Item</u>	<u>Quantity</u>
Wire Brush	1 ea
6 in. Adjustable Wrench	1 ea
Flat Tip Screwdriver	1 ea
Vacuum Cleaner	1 ea
Cheesecloth (Item 14, Appendix E)	ar
General Purpose Detergent (Item 16, Appendix E)	ar
Paint (Item 36, Appendix E)	ar
Paint Brushes	ar
Plastic Utility Pail (Item 35, Appendix E)	1 ea
Tape, Electrical Insulation (Item 59, Appendix E)	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

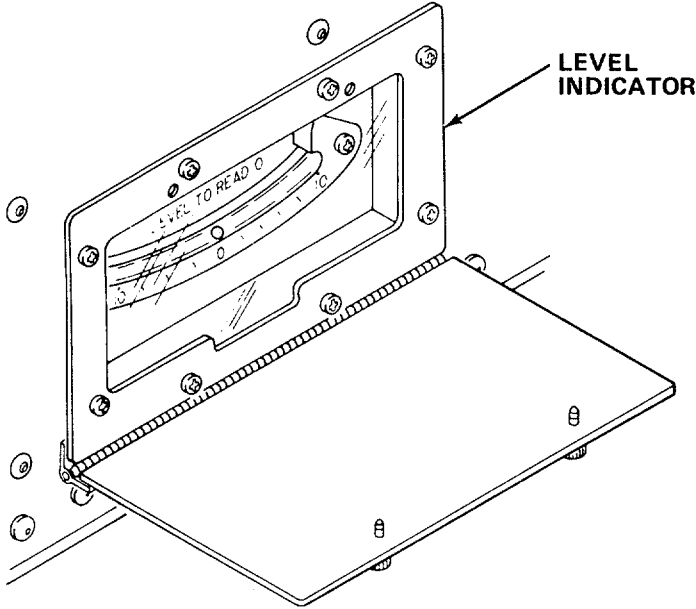
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
1	B/W	<p>VAN BODY</p> <p><u>Inspect Exterior.</u></p> <p>1. Inspect surfaces for punctures, cracks, or open seams that could permit moisture to enter wall.</p> 	Punctures, cracks, or open seams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

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
1	B	<p>VAN BODY - Cont</p> <p><u>Inspect Exterior - Cont</u></p> <p style="text-align: center;">WARNING</p> <p style="text-align: center;">To prevent death or serious injury, do not handle or clean power cable or connectors when cable is connected to power source.</p> <p>3. Inspect power cable assembly for dirt or damaged connectors.</p> <p style="padding-left: 20px;">a. Wipe cable insulation with clean, dry cloth to remove dirt.</p> <p style="padding-left: 20px;">b. Clean corrosion from terminals.</p> <div style="text-align: center;"> <p>The diagram shows a rectangular power entry panel with a grid of 20 mounting holes. It contains several components: a 'TRIPPER' switch, an 'AUTO' switch, and a central connector assembly. Two warning labels are present: one on the bottom left that reads 'CAUTION GROUND TRAILER BEFORE APPLYING MAIN POWER' and one on the bottom right that reads 'CAUTION DO NOT REMOVE THIS PROTECTIVE COVER UNTIL AFTER THE TRAILER IS DISCONNECTED FROM THE MAIN POWER SOURCE'. An arrow points to the right edge of the panel with the label 'POWER ENTRY PANEL'.</p> </div>	Connector damaged.
	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.

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

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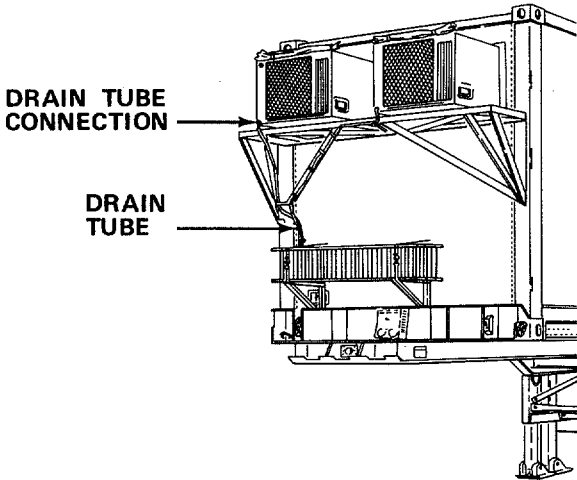
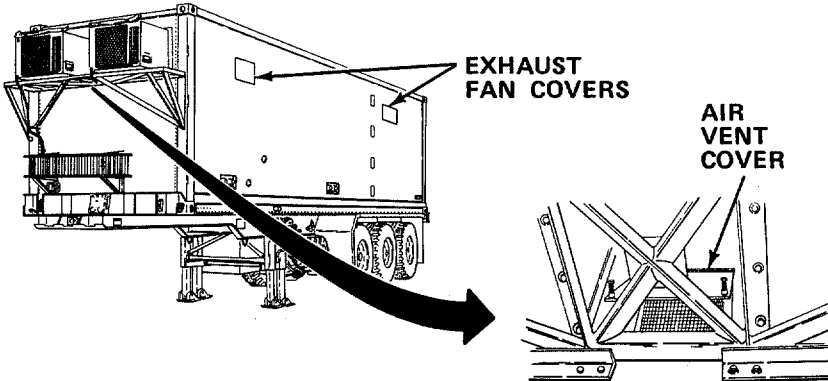
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
1		<p>VAN BODY - Cont</p> <p><u>Inspect Exterior - Cont</u></p>  <p>DRAIN TUBE CONNECTION</p> <p>DRAIN TUBE</p> <p>B/W 6. Inspect air conditioner/heater drain tube to be sure tube is positioned as shown. Check for breaks and crimps in hose and check connections for damage or leakage.</p>  <p>EXHAUST FAN COVERS</p> <p>AIR VENT COVER</p> <p>B/W 7. Inspect exhaust fan covers and air vent cover to be sure they are not blocked or clogged. Clean as required. Clean screen with vacuum cleaner as necessary.</p>	

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ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
1	B/W	<p><u>VAN BODY - Cont</u></p> <p><u>Inspect Exterior - Cont</u></p> <p>8. Visually inspect ground connections to be sure ground cable is connected to terminal lug and ground rod. Clean if necessary. missing.</p> <p style="text-align: center;"><u>WARNING</u></p> <p>Electrical shock hazard. Power cable must be de-energized before servicing entry panel connections. Death can result from failure to observe these safety precautions.</p> <p>a. Turn power off to cable. Disconnect from power source.</p> <p>b. Disconnect ground lug from ground rod.</p> <p>c. Clean lug, cable end, and rod with wire brush.</p> <p>d. Reconnect ground cable lug to rod.</p> <p>e. Disconnect ground cable end from entry panel.</p> <p>f. Clean terminal and cable end with wire brush.</p> <p>g. Reconnect ground cable to entry panel.</p> <p>h. Reconnect cable to power source. Turn power on.</p>	Ground connections are broken or

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ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
1	B	<p><u>VAN BODY - Cont</u></p> <p><u>Inspect Exterior - Cont</u></p> <p>9. Inspect boarding ladders for:</p> <p style="padding-left: 40px;">a. Secure attachment of handrails.</p> <p style="padding-left: 40px;">b. Steps not broken.</p> <p style="padding-left: 40px;">c. Locking pins in place.</p> <p>10. Inspect folding ladder for:</p> <p style="padding-left: 40px;">a. Secure attachment to support bracket.</p> <p style="padding-left: 40px;">b. Broken or missing ladder rungs.</p> <p style="padding-left: 40px;">c. Missing or deteriorated safety shoes.</p> <p>B/D/ A Q 11. Inspect front and rear van body locks to be sure locks are fully engaged.</p> <p>Q 12. Inspect gaskets on personnel doors for leaks or damage.</p> <p>W 12.1 Inspect hinges for proper placement of hinge pins.</p> <p>Q 13. Clean and paint blistered, pitted, rusting, or flaking-areas and bare metal spots in accordance with instructions contained in TM 43-0139, Painting Instructions for Field Use.</p>	<p>Steps are broken or will not lock in place.</p> <p>Broken or missing rung. Missing or deteriorated safety shoes.</p> <p>Lock disengaged.</p> <p>Missing hinge</p>
2	B/D	<p><u>Inspect Interior.</u></p> <p>1. Test emergency lights by pressing test button.</p>	<p>Emergency lights do not light.</p>

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2		<u>VAN BODY - Cont</u>	
		<u>Inspect Exterior - Cont</u>	
	W	2. Inspect power cords and cables to be sure wires are not kinked, cut, or cracked. cut.	Wires or cables are cracked or
	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.
	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.	
		<p style="text-align: center;">NOTE</p> <p>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.</p>	

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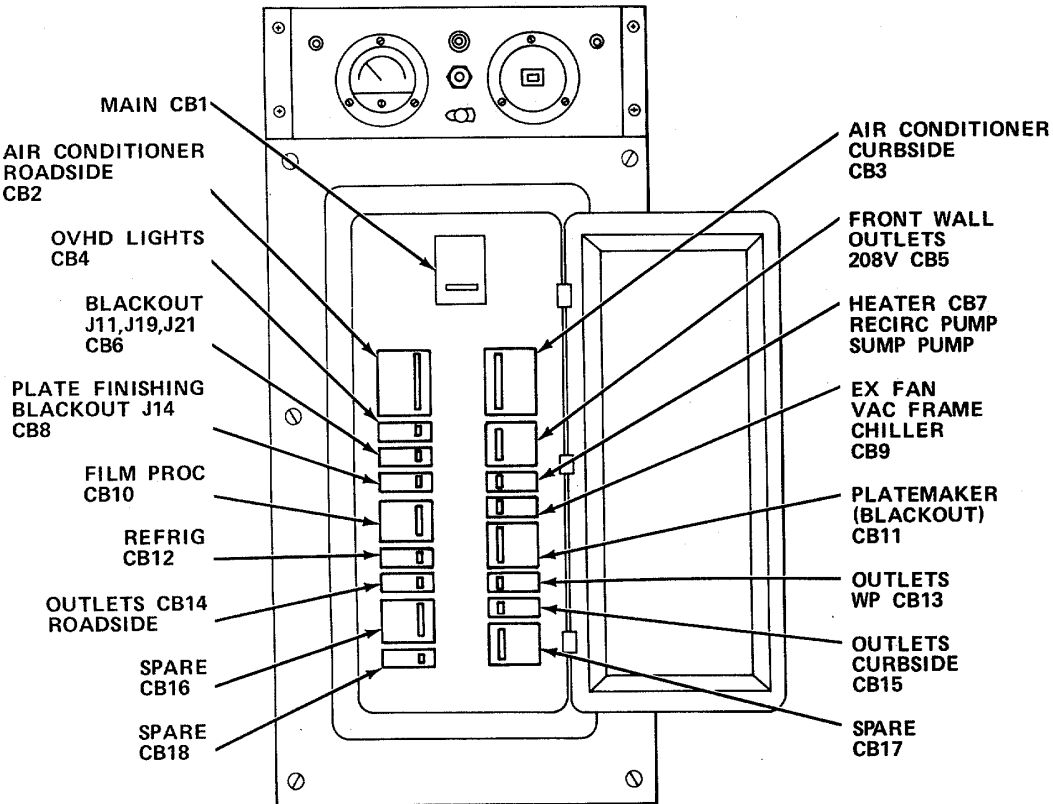
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
2		<p><u>VAN BODY - Cont</u></p> <p><u>Inspect Exterior - Cont</u></p>  <p>a. Set main circuit breaker to ON.</p> <p>b. Set each circuit breaker to OFF, then ON.</p>	

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ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
2	Q B/A A	<p><u>VAN BODY - Cont</u></p> <p><u>Inspect Exterior - Cont</u></p> <p>9. Inspect light traps.</p> <ul style="list-style-type: none"> a. Turn on fluorescent lamps (high level). b. Close entrance doors. Have exhaust fan covers and air vent cover open. Inspect for light leakage. c. Place light switches ON; blackout override switches OFF. d. Open door and make sure internal lights go off. <p>10. Inspect water systems.</p> <ul style="list-style-type: none"> a. Inspect for leaks in tanks or piping. b. Inspect for secure fastening of piping to section walls. c. Inspect internal plumbing to be certain that unused valves are closed. <p>11. Inspect/clean interior.</p> <p style="text-align: center;"><u>WARNING</u></p> <p>Death or serious injury may occur if wet or damp cloth is used to wipe or clean energized equipment, power cords, or cables.</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>Do not sweep interior. Dislodged dirt or dust will ruin optical, electronic, and photographic equipment and supplies.</p>	<p>Light leaks are present.</p> <p>Blackout system is inoperable.</p> <p>Water leaks.</p>

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

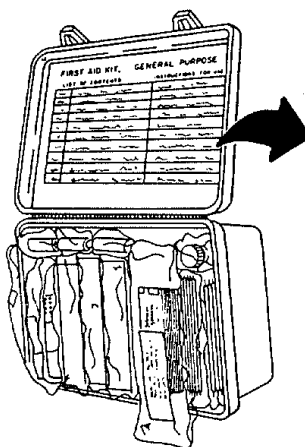
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ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
2	S	<p><u>VAN BODY - Cont</u></p> <p><u>Inspect Exterior - Cont</u></p> <ol style="list-style-type: none"> a. Wipe vertical and horizontal painted surfaces with cleaning cloth moistened with solution of general purpose detergent and fresh water until soil is removed from painted surfaces. 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. <p>12. Inspect first aid kit.</p>	



FIRST AID KIT, GENERAL PURPOSE		
LIST OF CONTENTS	INSTRUCTIONS FOR USE	
3 ROLLS	ADHESIVE TAPE, SURGICAL, 1"X1 1/2" YARDS	USE FOR MINOR CUTS AND COLTHING REPAIR
18 EACH	BANDAGE, ADHESIVE, 3"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, 3"X3 1/2"X3 1/2" INCH	USE FOR SLING
1 PKG	BLADE, SURGICAL PREPARATION RAZOR, STRAIGHT, SINGLE EDGE, 5/8"	SHAVING HAIR AND OPENING WOUNDS AS REQUIRED
1 PKG	COMPRESS AND BANDAGE, CAMOUFLAGED, 2"X2", 4"	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"X3 1/2", 3"	FOR BURNS, APPLY PAD OVER BURN
1 BTL	POVIDONE, IODINE SOLUTION, 1/2 OUNCE	AS DISINFECTANT AND CLEANSER OF CUTS AND WOUNDS; APPLY BEFORE BANDAGING
1 EACH	AMMONIA INHALANTS	CURL UP 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.

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ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
2	B/W	<p><u>VAN BODY - Cont</u></p> <p><u>Inspect Exterior - Cont</u></p> <ul style="list-style-type: none"> e. Replace damaged or missing items. f. Repack kit. g. Reinstall kit. <p>13. Inspect blackout curtains.</p> <ul style="list-style-type: none"> 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.
3	B	<p><u>Inspect Air Conditioner/Heater.</u></p> <p>Refer to TM 5-4120-367-14 for preventive maintenance checks and services.</p>	
4	M	<p><u>Service Power Cable.</u></p> <p style="text-align: center;"><u>WARNING</u></p> <p>Electrical shock hazard. Power cable must be de-energized before servicing. Death or serious injury may occur from failure to observe this safety precaution.</p> <ol style="list-style-type: none"> 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 Photomechanical 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.

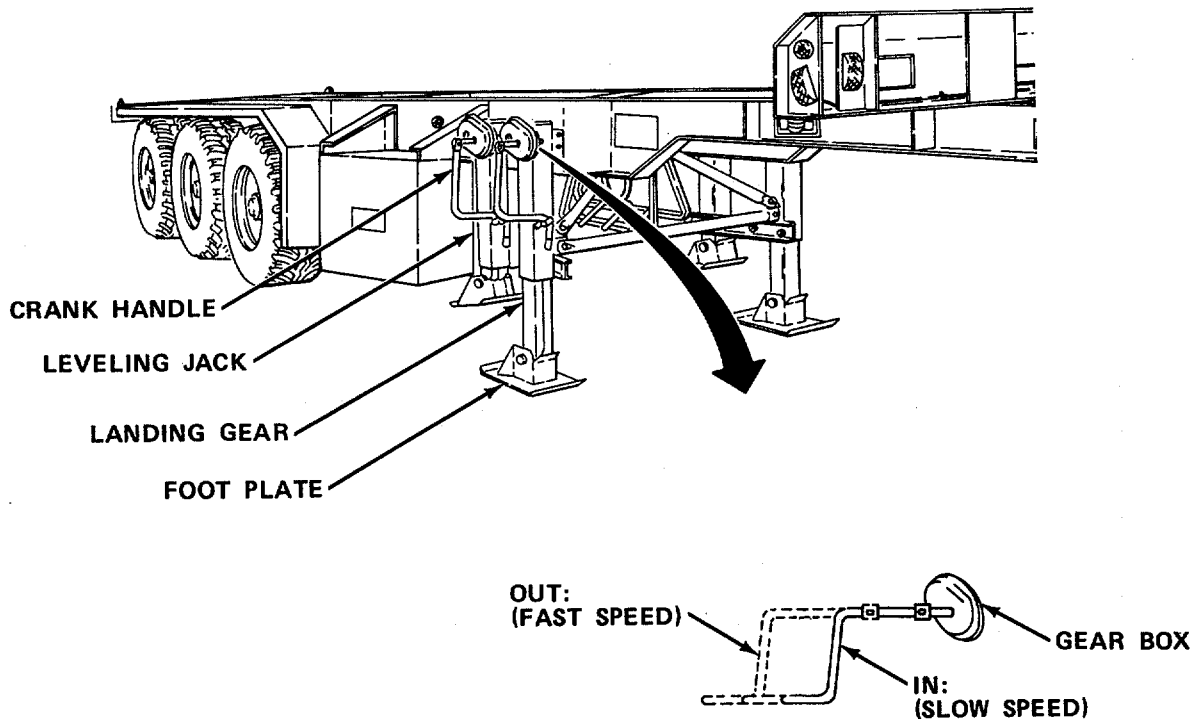
a. Procedures for leveling.

CAUTION

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

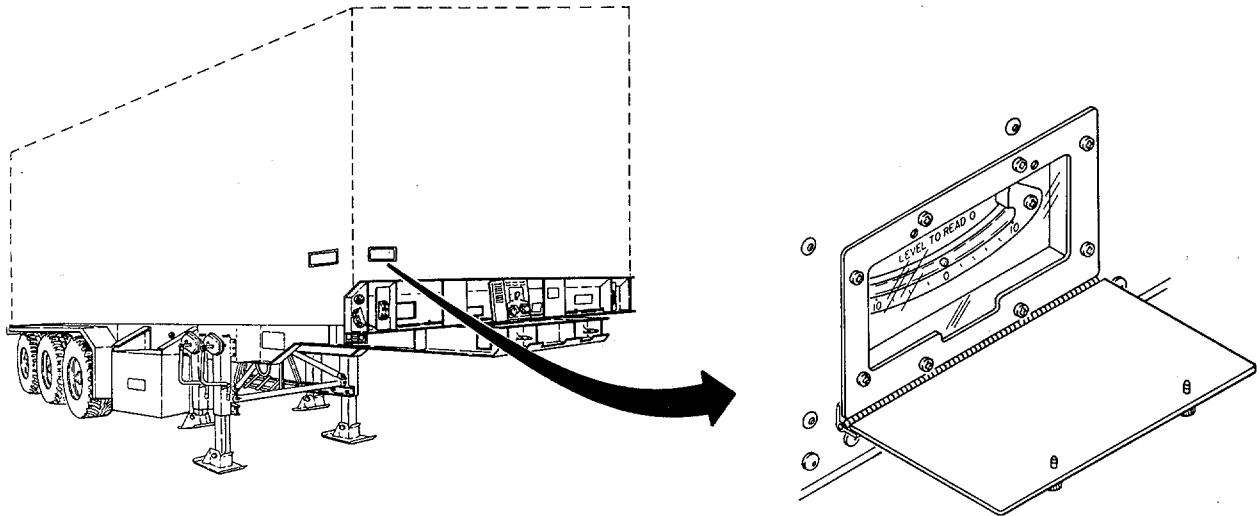
NOTE

- 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 from 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.

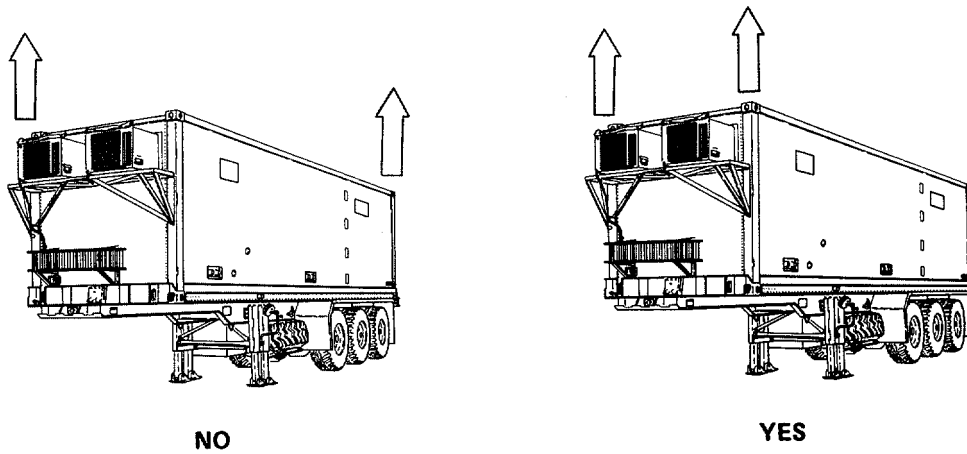
- (2) Approximately level trailer chassis by raising or lowering landing gear.
- (3) Move handle from secured location and swing out.
- (4) Pull crank handle on each leveling jack all the way out and engage. There are two positions when handle is engaged. Fully out is fast speed. In is slow speed.
- (5) Lower each leveling jack by turning crank to right at fast speed until foot plate just contacts ground.



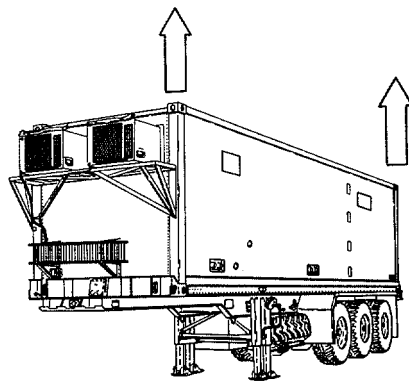
- (6) Station personnel to have a clear view of level indicators at both front and rear of section.
- (7) Observe level indicators to determine which end and side must be raised.

CAUTION

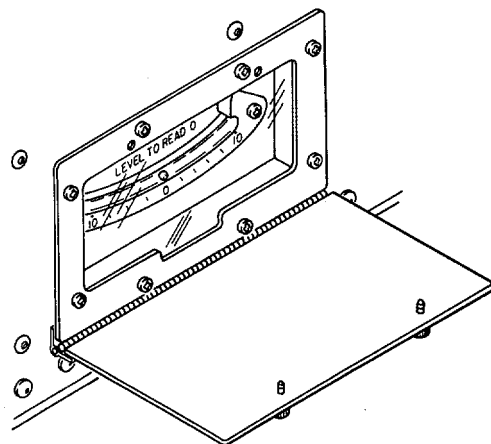
Do not attempt to level section by lifting at diagonal corners or frame will be twisted.



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



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

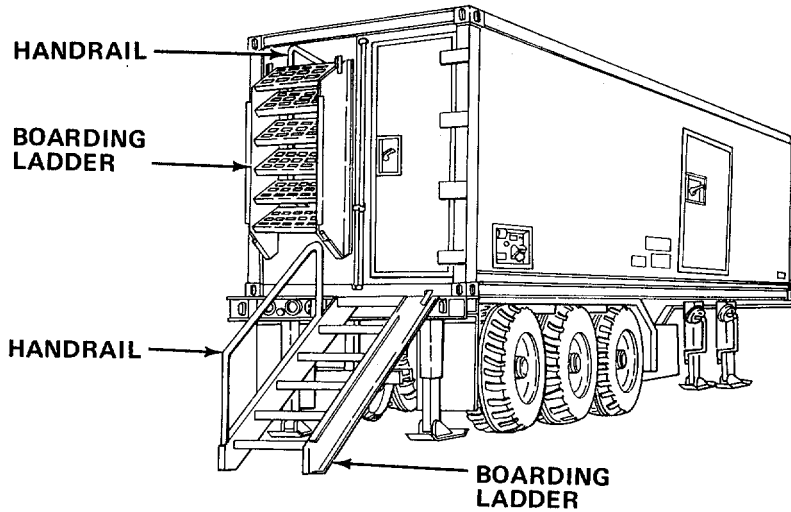


NOTE

Be sure ball is within one-half division of center on all four level indicators.

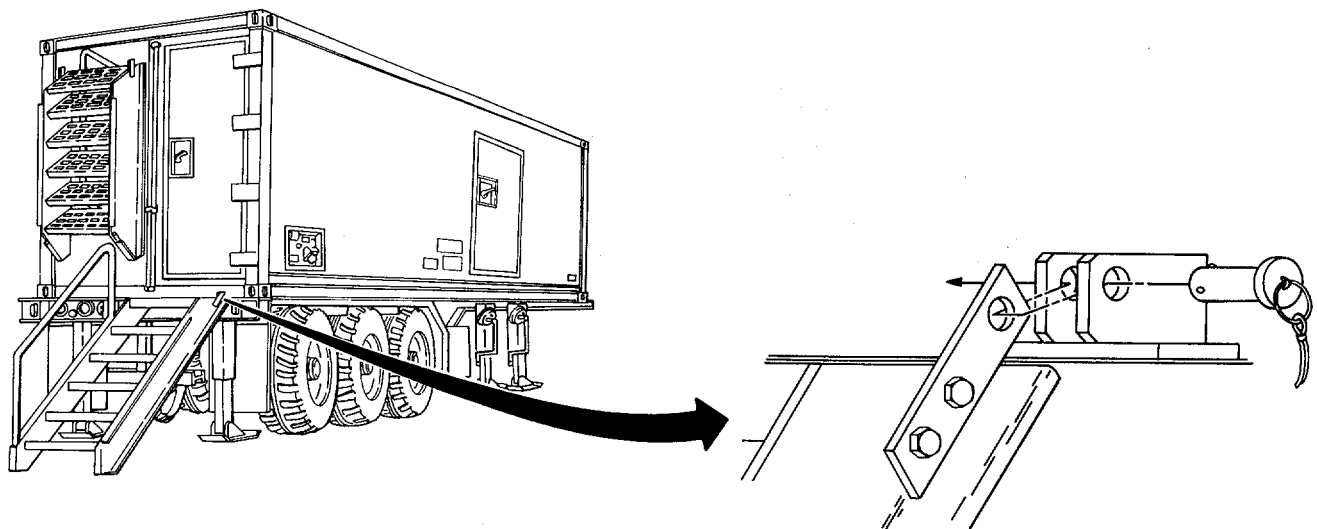
(10) Pull leveling crank handles away from trailer chassis and lower crank handle to stowed position.

b. Procedures to activate section.

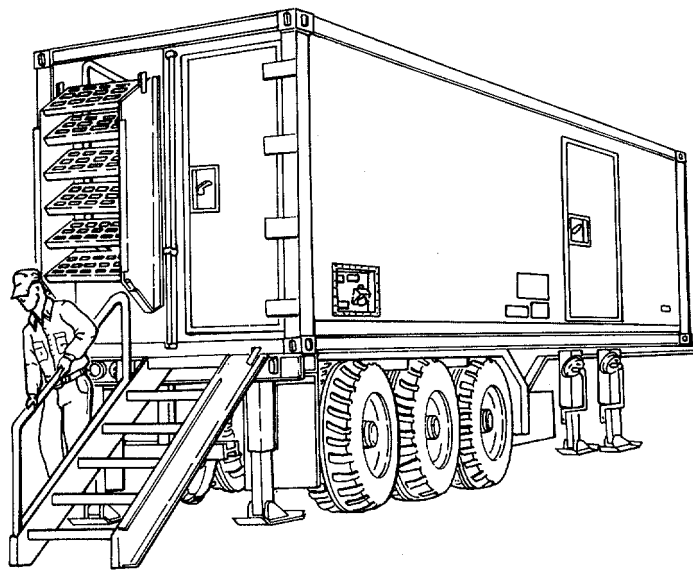


(1) Remove boarding ladders and handrails from rear of section.

(2) Remove handrails from ladders.



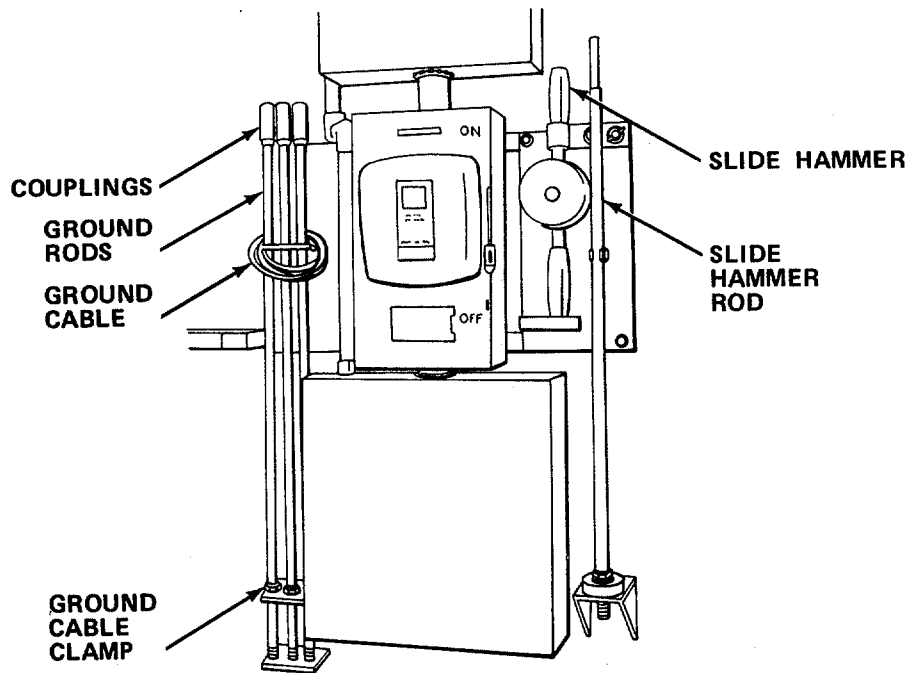
(3) Mount ladders at personnel doors and secure with locking pins.



- (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

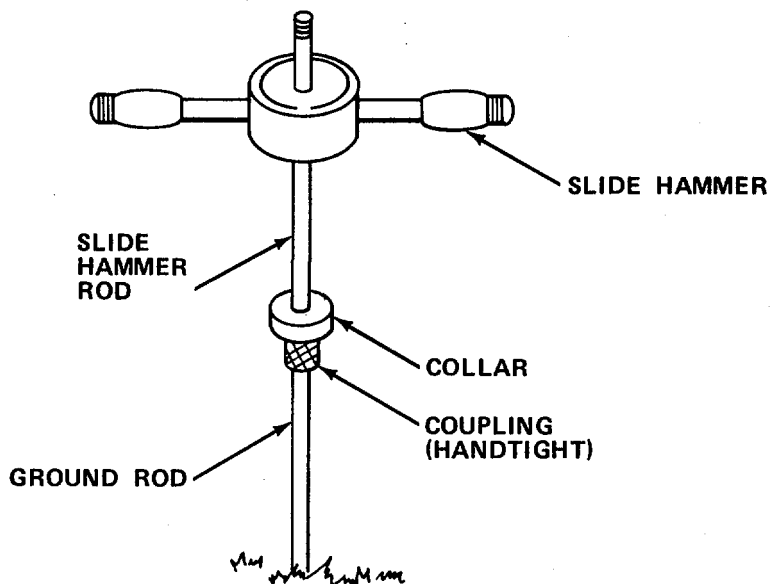
Death or serious injury may result from connecting power cable to section before grounding.



- (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

To prevent loss of rod or thread damage, 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.

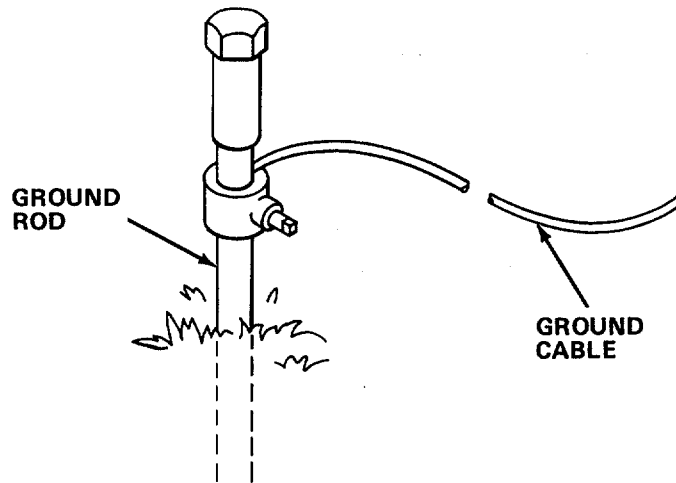
NOTE

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.

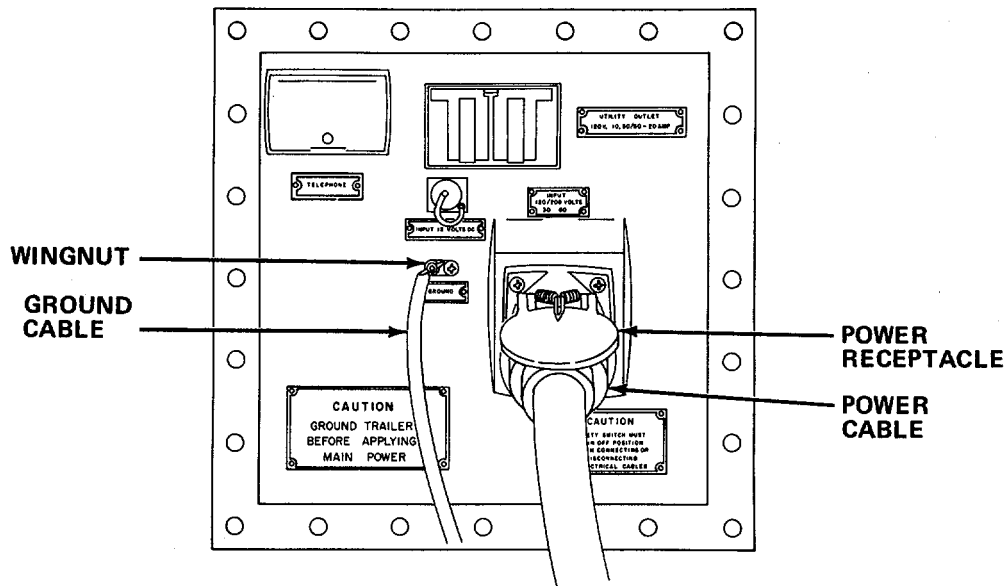


WARNING

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 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.

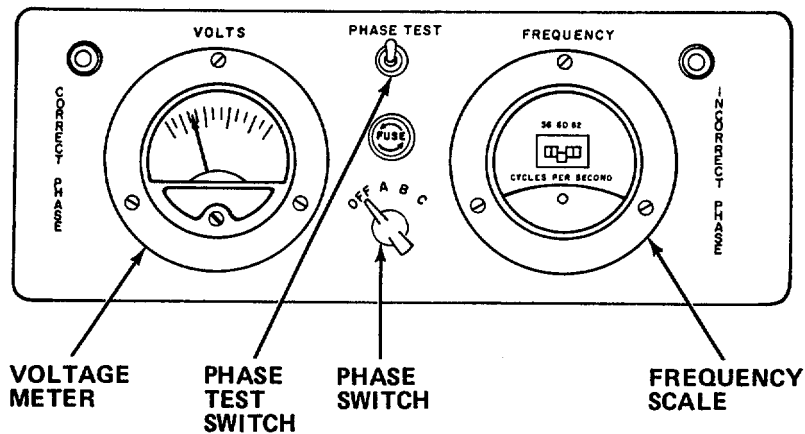


(11) Connect ground cable to ground lug with wingnut.

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

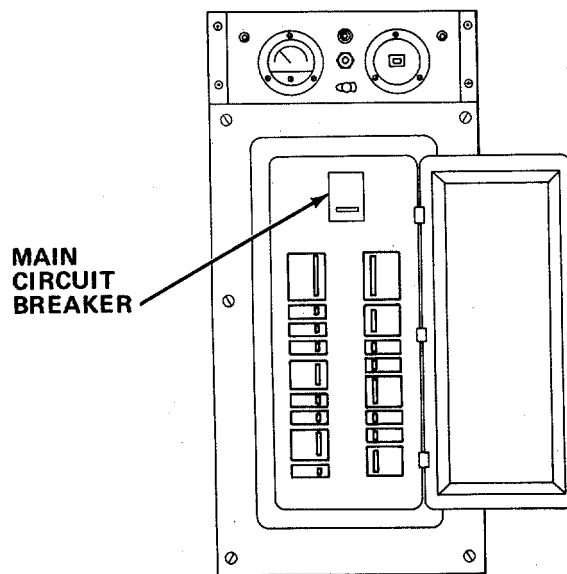
Do not energize section if incorrect phase lamp lights. Damage to equipment may result.

- (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.

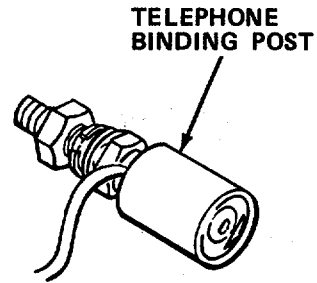
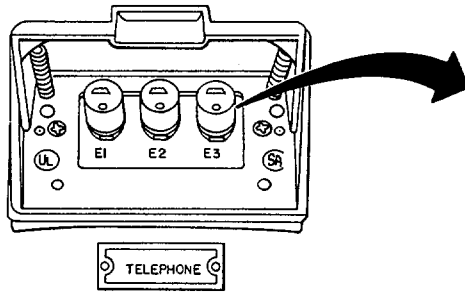
NOTE

This step must be accomplished if section is placed in 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.



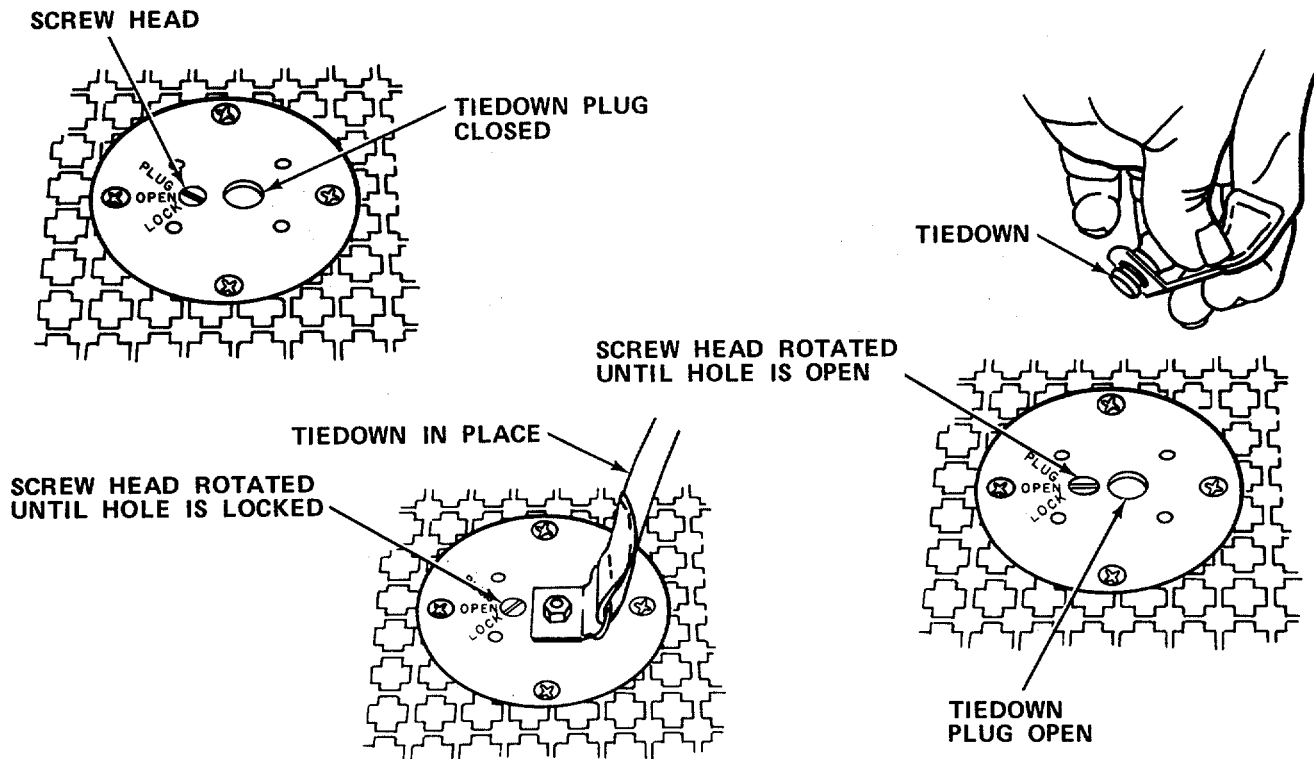
(18) Connect telephone lines to corresponding interior binding posts.

(19) Check blackout switches.

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

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.

WARNING

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

- e. Turn equipment switches off.

WARNING

Movement of section with filled water and recirculation tanks will raise the center of gravity, cause unstable weight distribution, and may result in severe personnel injury or equipment damage.

- f. Drain water and recirculation tanks in accordance with local directions.

WARNING

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

- g. Turn equipment switches OFF.
- h. Turn main circuit breaker OFF.
- i. Turn safety switch OFF.
- j. Have power cable disconnected at power supply end. Disconnect power cable from receptacle. Put cable in storage box on trailer chassis.
- k. Turn emergency light switch OFF.
- l. 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.

- m. 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 covers and air vent cover are securely closed.

- n. Reinspect section interior for loose equipment and close all vents.
- o. Close section. Secure and lock all personnel doors and cargo door.

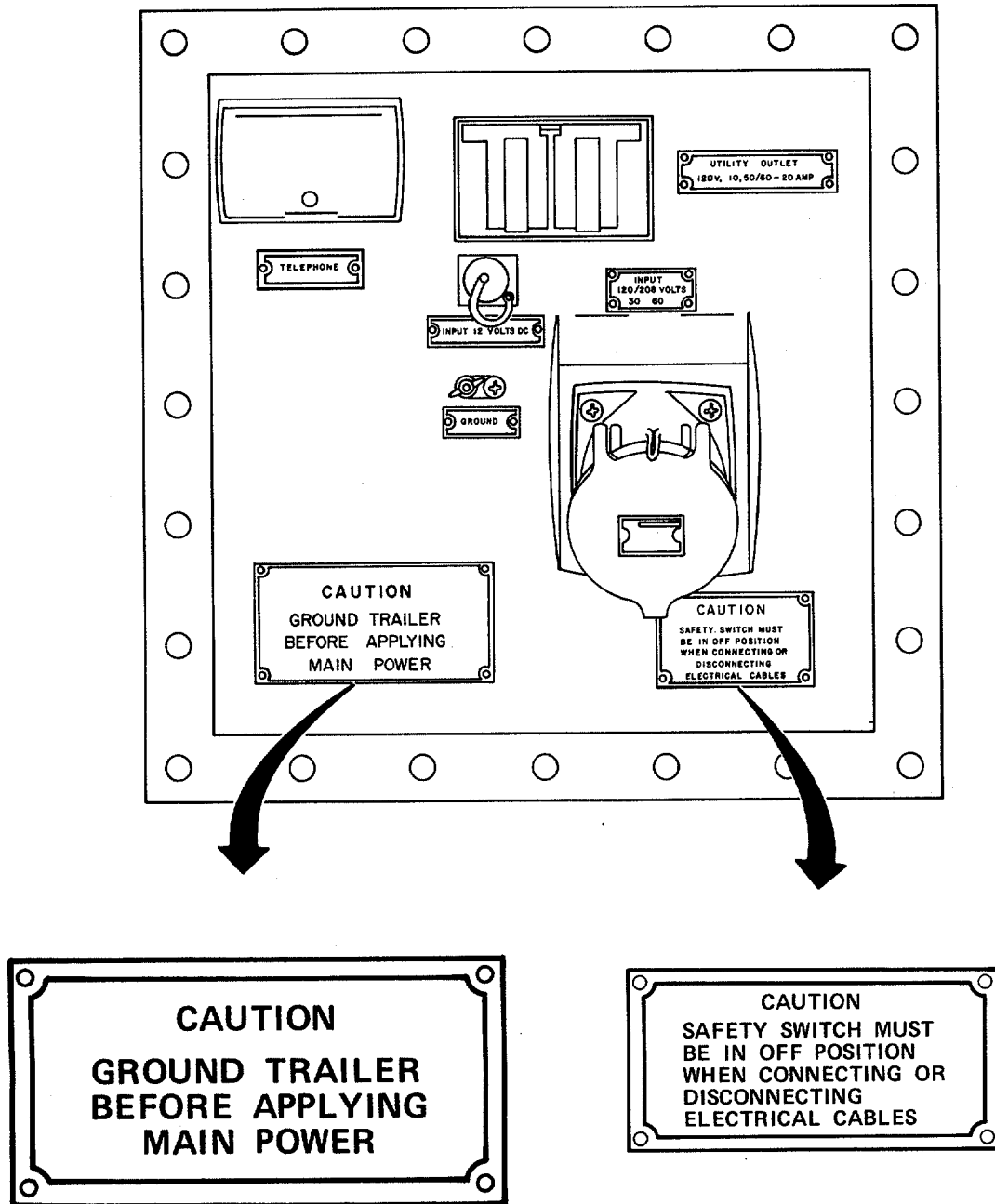
NOTE

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

- p. Remove handrails from boarding ladders.
- q. Remove boarding ladders and insert handrails into back of ladders.
- r. Secure ladders to back of section.

- s. Fully extend landing gear.
- t. Retract leveling jacks.
- u. Visually inspect van exterior to be sure all equipment and covers are secured.

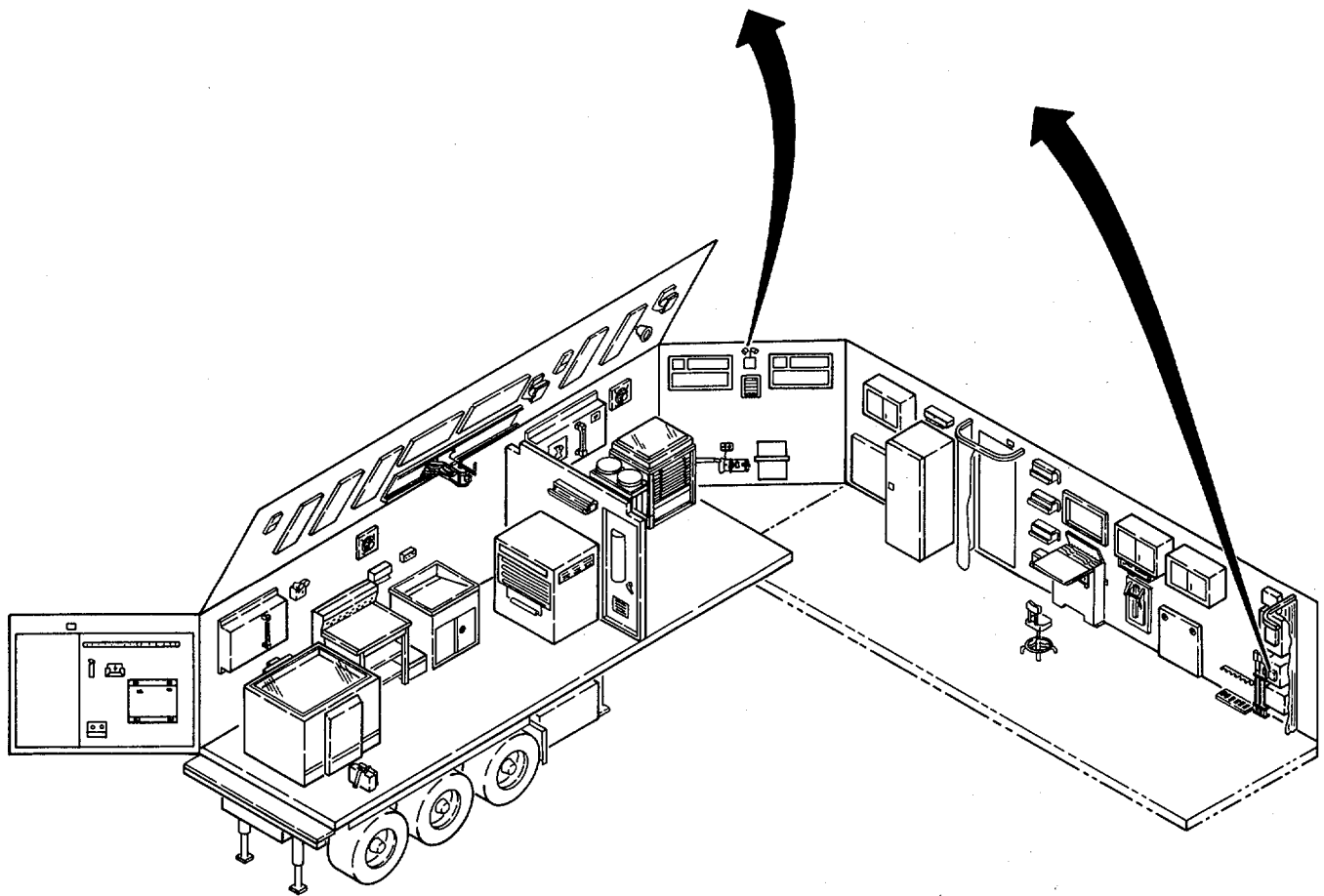
1-6.3 Operating Instructions on Decals and Instruction Plates.



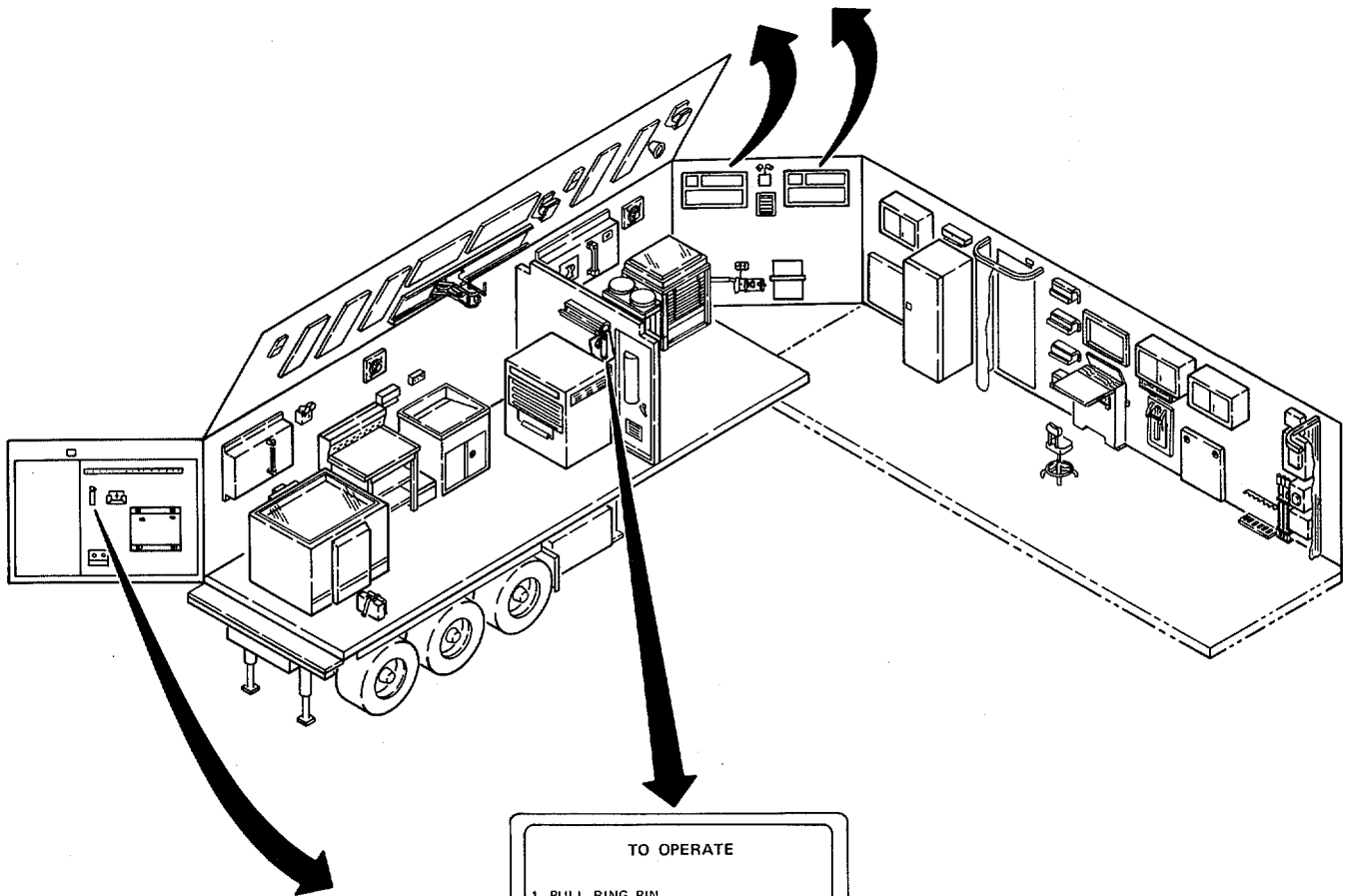
CAUTION

**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



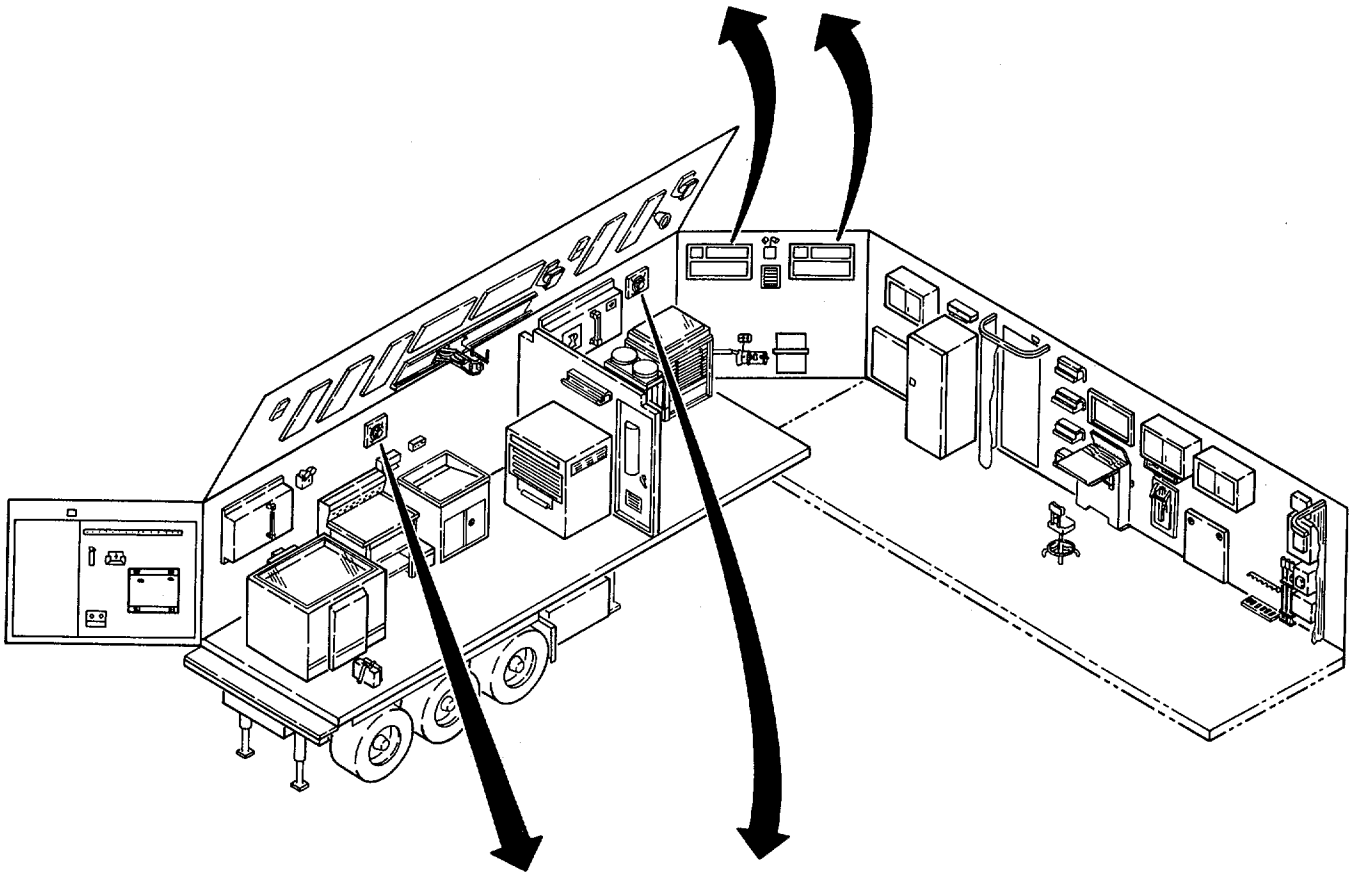
TO OPERATE

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

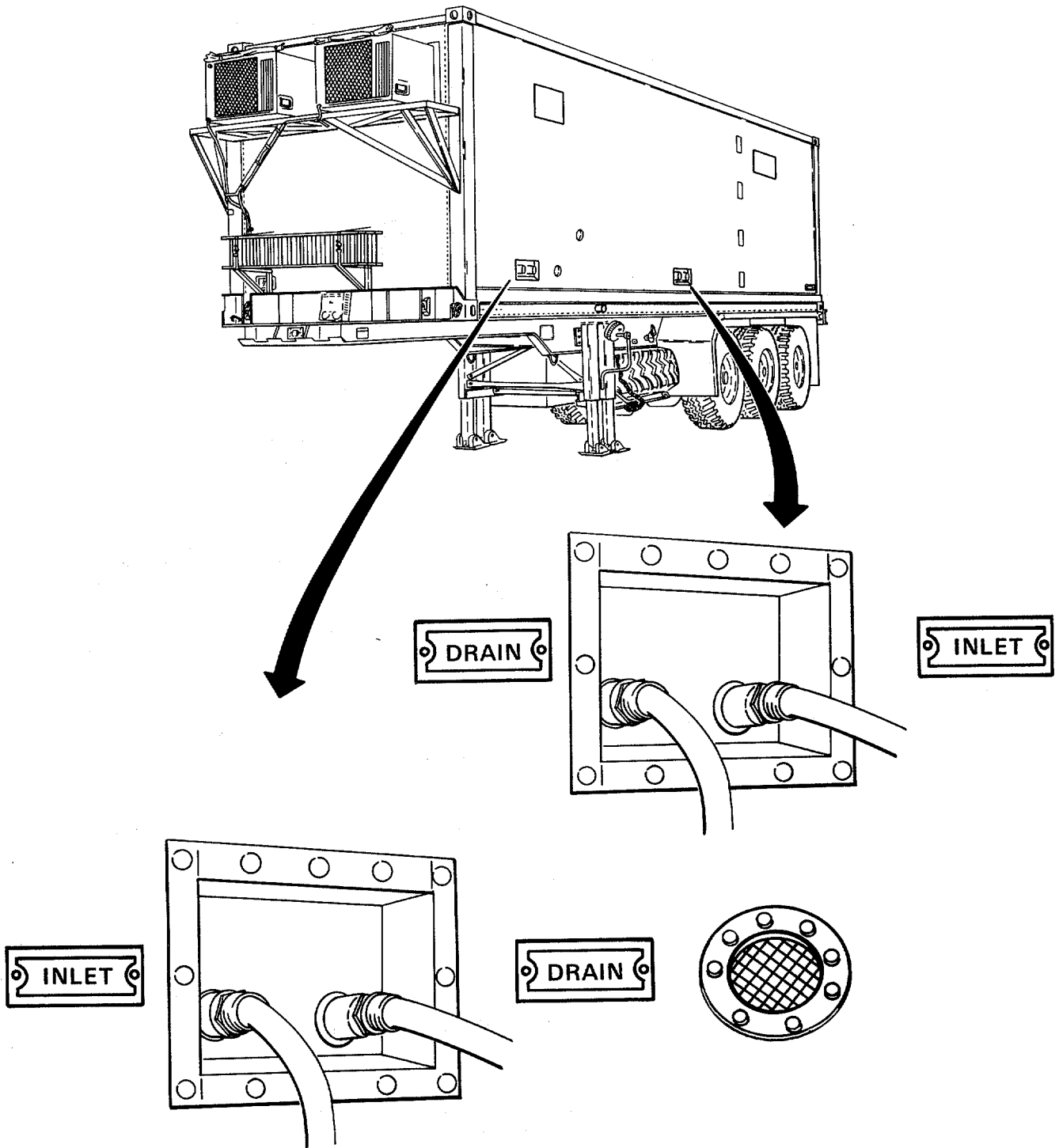
EXTINGUISHER, FIRE, CF₃BR, 2 3/4 LB

CAUTION
FOR SAFE OPERATION
SEE TM FOR PROPER
INTERNAL AND EXTERNAL
GROUNDING

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



CAUTION
OPEN OUTSIDE VENTS BEFORE
OPERATING FANS

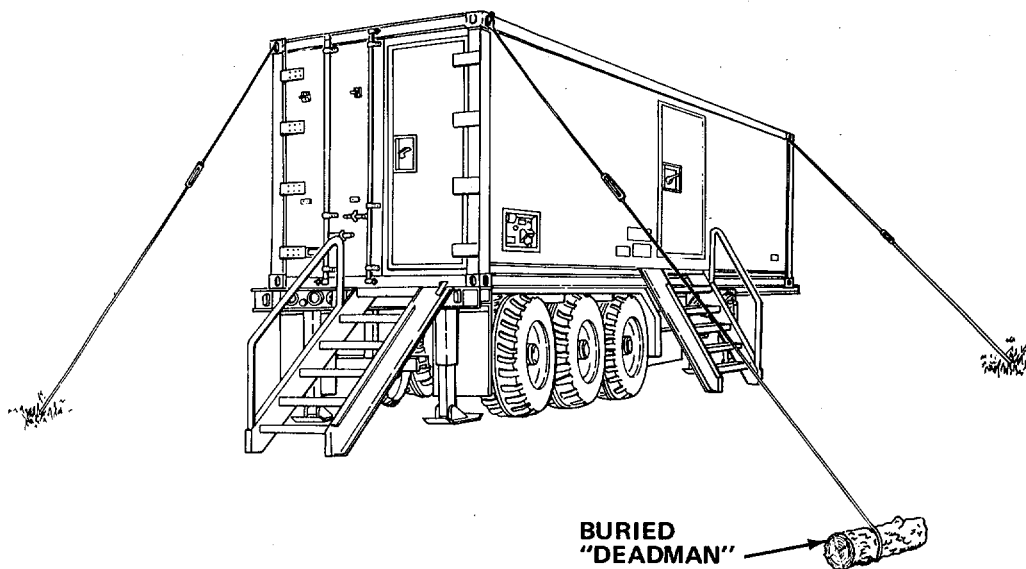


1-7. OPERATION UNDER UNUSUAL CONDITIONS.**NOTE**

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.

c. 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 those items in an area to prevent equipment or document damage.

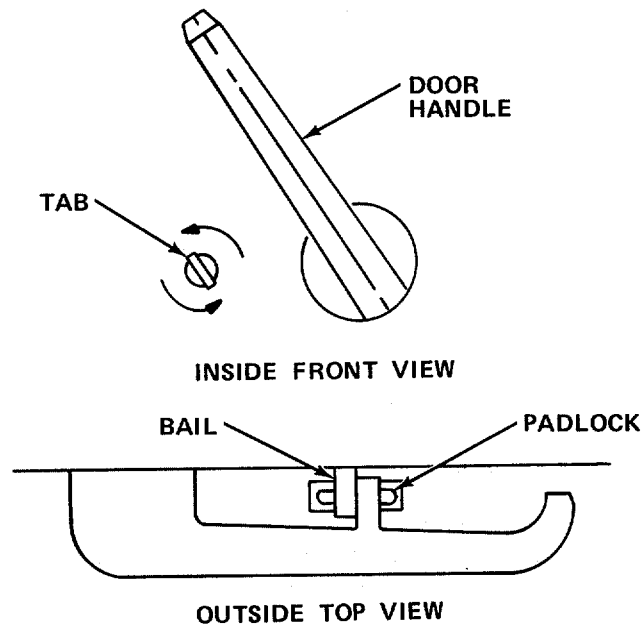
d. Drain water tanks and recirculating tanks anytime the section heaters are inoperative or a power loss is expected, to prevent damage from freezing.

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 padlock falls free. The door handle is now free to turn.

Section III. OPERATOR'S MAINTENANCE INSTRUCTIONS

1-8. LUBRICATION INSTRUCTIONS.

a. Lubrication instructions for the Photomechanical Section are contained in LO 5-3610-252-12, Lubrication Order, Photomechanical Section, Topographic Support System. The intervals and task-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. OPERATOR'S TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during operation or maintenance of the Photomechanical 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. OPERATOR'S TROUBLESHOOTING

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

1. NO ELECTRICAL POWER TO SECTION.

WARNING

Death or serious injury may result. Do not perform any electrical 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 ± 5 V, 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. OPERATOR'S 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 all circuit breakers are ON, refer to direct/general support maintenance.
- (b) If any circuit breakers are OFF, turn ON.

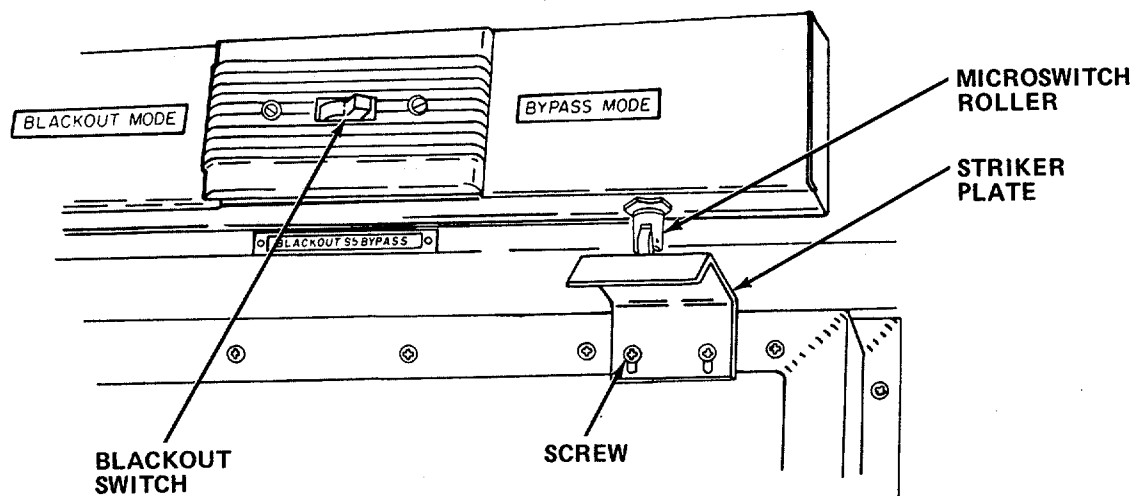
Table 1-2. OPERATOR'S TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

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. OPERATOR'S MAINTENANCE PROCEDURES.

a. This section contains instructions covering operator maintenance functions for the Photomechanical 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

PROCEDURE	PARAGRAPH
Replace Fluorescent Lamp	1-10.1
Service Ventilation Ducts	1-10.2
Replace Blackout/Dome Light	1-10.3

1-10.1 Replace Fluorescent Lamp.

MOS: 83E, Photo and Layout Specialist

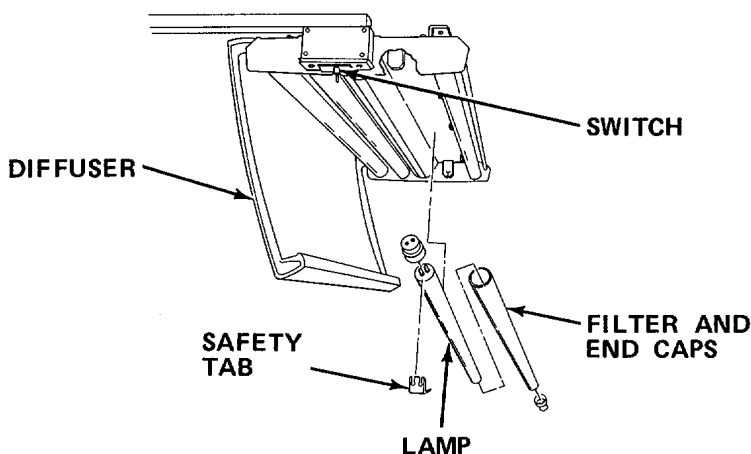
TOOLS: None

SUPPLIES: Fluorescent Lamp

WARNING

Death or serious injury may result from electrical shock if power cord 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. Remove filter and end caps; reinstall on new lamp.
- f. Insert new lamp prongs into slot and rotate 90 degrees.
- g. Reinstall safety tab into lamp socket.
- h. Reinstall diffuser.
- i. Turn power ON.

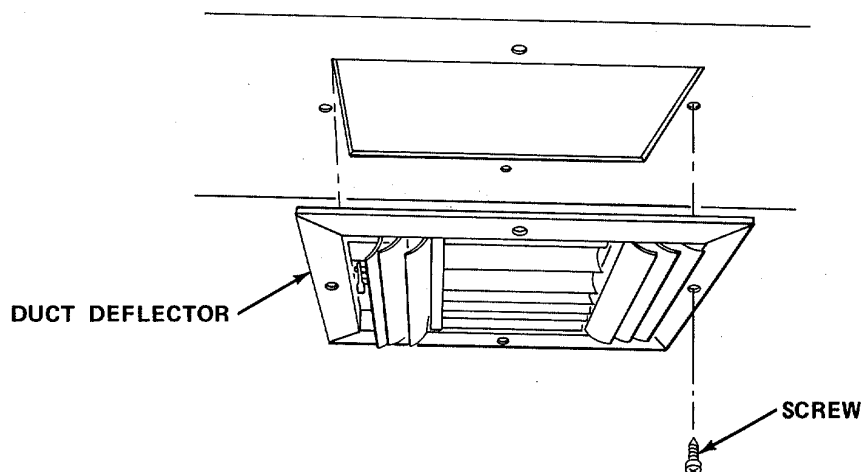
1-10.2 Service Ventilation Ducts.

MOS: 83E, Photo and Layout Specialist

TOOLS: Vacuum Cleaner
Cross 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.
1. Remove equipment covers for operation.

1-10.3 Replace Blackout/Dome Light.

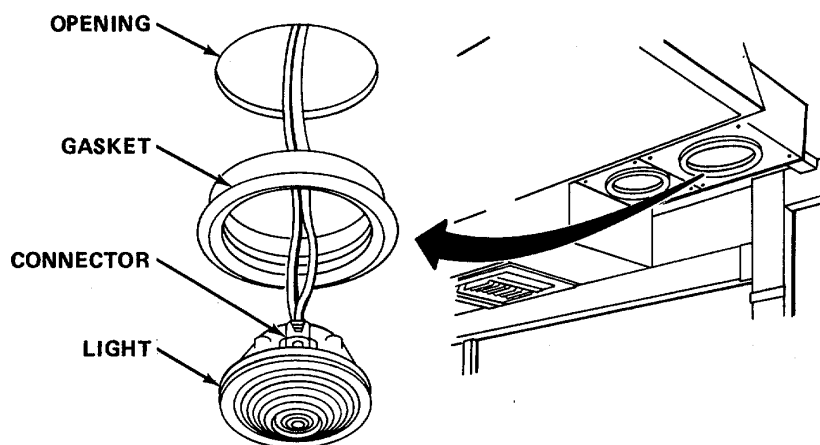
MOS: 83E, Photo and Layout Specialist

TOOLS: None

SUPPLIES: Lamp (12 V)
Silicone Spray (Item 56, 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 INSTRUCTIONS

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 5-3610-285-24P 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.

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on the 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 loose equipment.

(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 73511-2.

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) 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.

c. Interval column. 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:

<u>Item</u>	<u>Quantity</u>
Vacuum Cleaner	1 ea
8 in. Adjustable Wrench	1 ea
Cross Tip Screwdriver	1 ea
Flat Tip Screwdriver	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

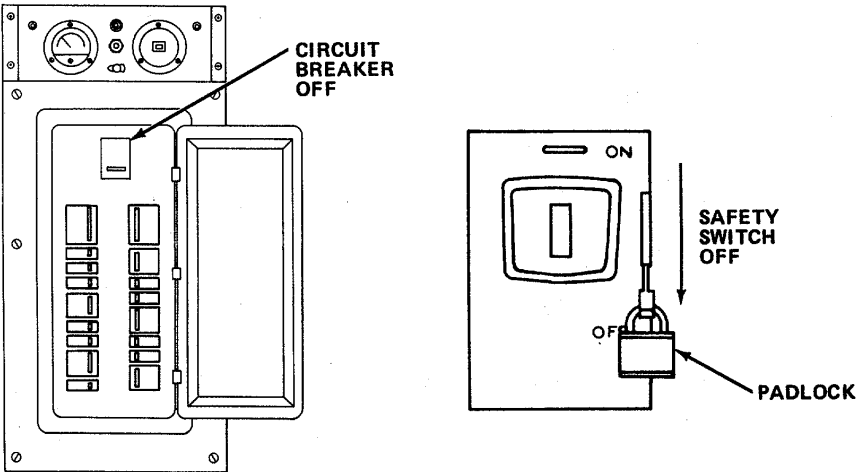
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
1	M	<p><u>VAN BODY</u></p> <p><u>Service Air Conditioner/Heater.</u></p> <p>Refer to TM 5-4120-367-14 for preventive maintenance checks and services.</p>
2	M	<p><u>Service Lighting System.</u></p> <div style="text-align: center;">  <p>The diagram shows two electrical components. On the left is an open electrical panel with a circuit breaker at the top. An arrow points to the breaker with the label 'CIRCUIT BREAKER OFF'. On the right is a safety switch with 'ON' and 'OFF' positions. An arrow points to the switch with the label 'SAFETY SWITCH OFF'. Below the switch is a padlock, with an arrow pointing to it labeled 'PADLOCK'.</p> </div> <p style="text-align: center;"><u>WARNING</u></p> <p>Do not open circuit breaker panel or service electrical connections, cables, or switches until main power is off and multimeter confirms circuit is not energized. Death may result from failure to observe these safety precautions.</p> <ol style="list-style-type: none"> 1. Turn off main circuit breaker. Turn safety switch OFF. 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
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
2	M	<p><u>VAN BODY - Cont</u></p> <p><u>Service Lighting System - Cont</u></p> <ol style="list-style-type: none"> 3. Tighten all 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 panel, and conduits. 6. Remove padlock. 7. Turn on main circuit breaker and safety switch.
3	M	<p><u>Service Air Vent.</u></p> <div style="text-align: center;"> <p>The diagram shows a perspective view of an air vent assembly. It consists of a main rectangular body with a door on the right side. On the left side, there is a grille. A screw is shown being removed from the front of the grille. On the right side, there is a screen. Labels with arrows point to the AIR VENT (the main body), GRILLE (the front panel), SCREW (a screw on the grille), SCREEN (a mesh screen on the side door), and DOOR (the side door).</p> </div> <ol style="list-style-type: none"> 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.

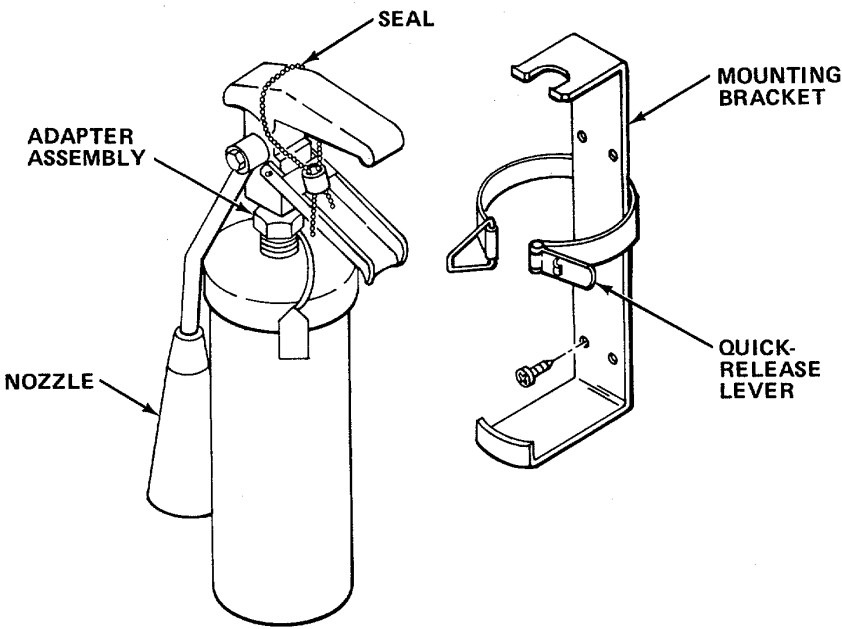
Table 1-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
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
4	M	<p style="text-align: center;"><u>VAN BODY - Cont</u></p> <p><u>Inspect Fire Extinguisher.</u></p> <div style="text-align: center;">  </div> <ol style="list-style-type: none"> 1. Remove from mounting bracket. Check free movement of bracket. 2. Inspect nozzle and adapter assembly for damage. 3. Inspect seal. Be sure it is not broken.

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.

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

d. If any component of the Photomechanical 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 troubleshooting. 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 ballast (paragraph 1-16.1).

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).

Table 1-4. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

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.

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. ORGANIZATIONAL MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the Photomechanical 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

PROCEDURE	PARAGRAPH
Replace Fluorescent Lamp Ballast	1-16.1
Replace Radio Frequency (RF) Filter	1-16.2
Replace Fluorescent Lamp Switch	1-16.3
Replace ON/OFF Switch.....	1-16.4
Replace Blackout/Dome Light Microswitch	1-16.5
Replace Receptacle	1-16.6
Replace Wire Molding.....	1-16.7
Repair Telephone Binding Post Assembly.....	1-16.8
Replace Exhaust Fan.....	1-16.9
Replace Exhaust Fan Cover.....	1-16.10
Replace Emergency Light Assembly	1-16.11
Repair Blackout Curtain	1-16.12
Repair Van Body Skin (Temporary).....	1-16.13
Replace Tiedown Socket.....	1-16.14
Repair Level Indicator	1-16.15
Replace Air Vent Screen.....	1-16.16
Replace Air Vent Cover.....	1-16.17
Repair Personnel Ladder.....	1-16.18

1-16.1 Replace Fluorescent Lamp Ballast.

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

TOOLS:

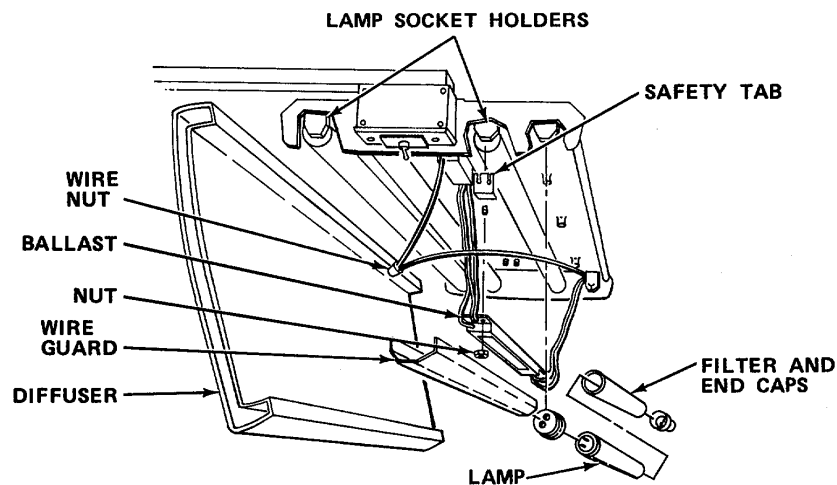
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Scribe
 Tool Kit, Precision Instrument Repair
 1/4 in. Drive Socket Set
 1/4 in. Nut Driver

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 with filters and end caps. 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.
- l. 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 lamps, filters, end caps, 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: 83FJ6, Reproduction Equipment Repairer
 or
 41B, Topographic Instrument Repair Specialist

TOOLS:

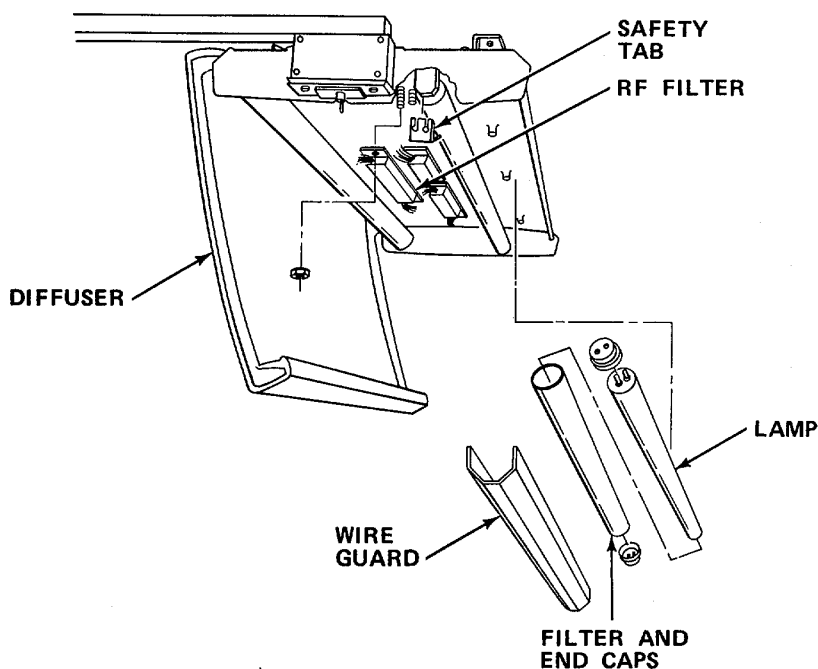
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Tool Kit, Precision Instrument Repair
 1/4 in. Drive Socket Set
 1/4 in. Nut Driver

SUPPLIES: RF Filter
 Wire Ties

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 fixture.
- c. Remove safety tabs, lamps, filters, and end caps. Place in diffuser.
- d. Squeeze light wire 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.
- l. 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, filters, end caps, and safety tabs.
- o. Reinstall diffuser.
- p. Turn on light switch.

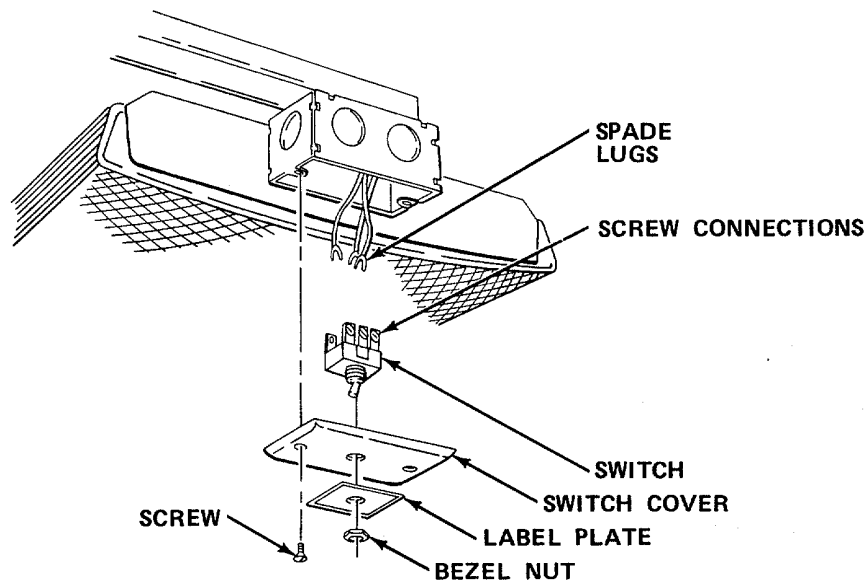
1-16.3 Replace Fluorescent Lamp Switch.

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

TOOLS:

Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Needle Nose Pliers
 Flashlight

SUPPLIES: Switch Assembly



WARNING

Death or serious injury may occur from electrical shock 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 two screws and cover plate.
- c. Note notch on label plate. Remove bezel nut and label plate, and cover plate from defective switch.

NOTE

Note position of cover and reinstall as noted.

- d. Tag and disconnect wires from defective switch.
- e. Install new switch and connect wires.

NOTE

Be sure label plate is in the same direction as when removed.

- f. Insert switch through cover plate and label plate. Secure with bezel nut.
- g. Aline cover plate with holes and secure with screws.
- h. Turn circuit breaker ON.

1-16.4 Replace ON/OFF Switch.

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

TOOLS:

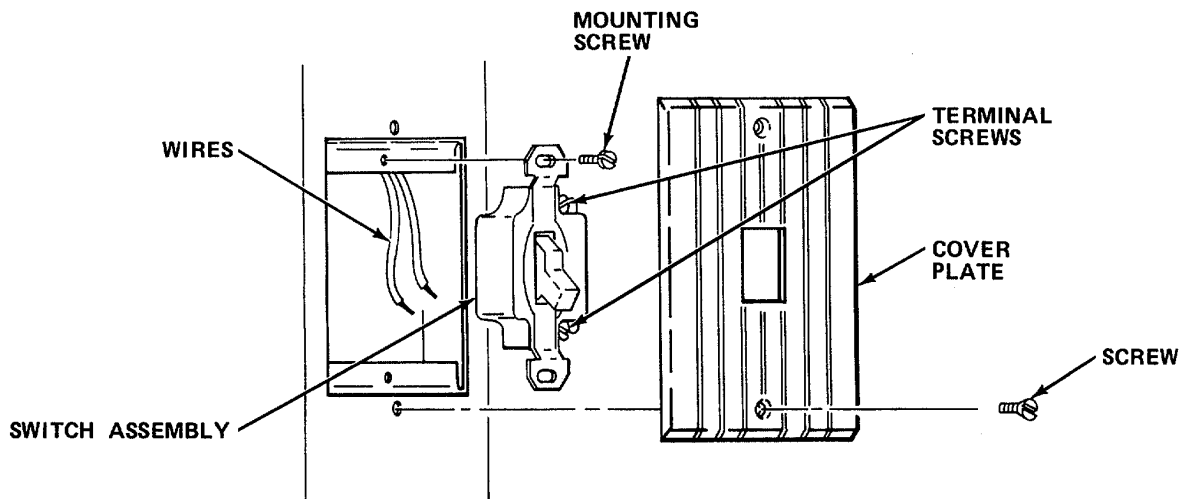
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver

SUPPLIES: Switch

WARNING

Death or serious injury may occur from electrical shock 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.

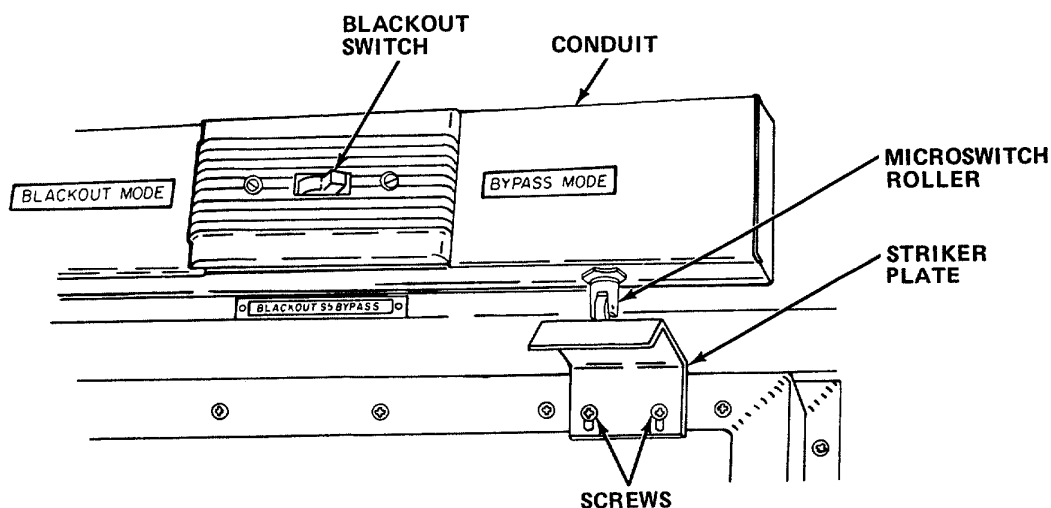
1-16.5 Replace Blackout/Dome Light Microswitch.

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

TOOLS:

Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 8 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
 or
 41B, Topographic Instrument Repair Specialist

TOOLS:

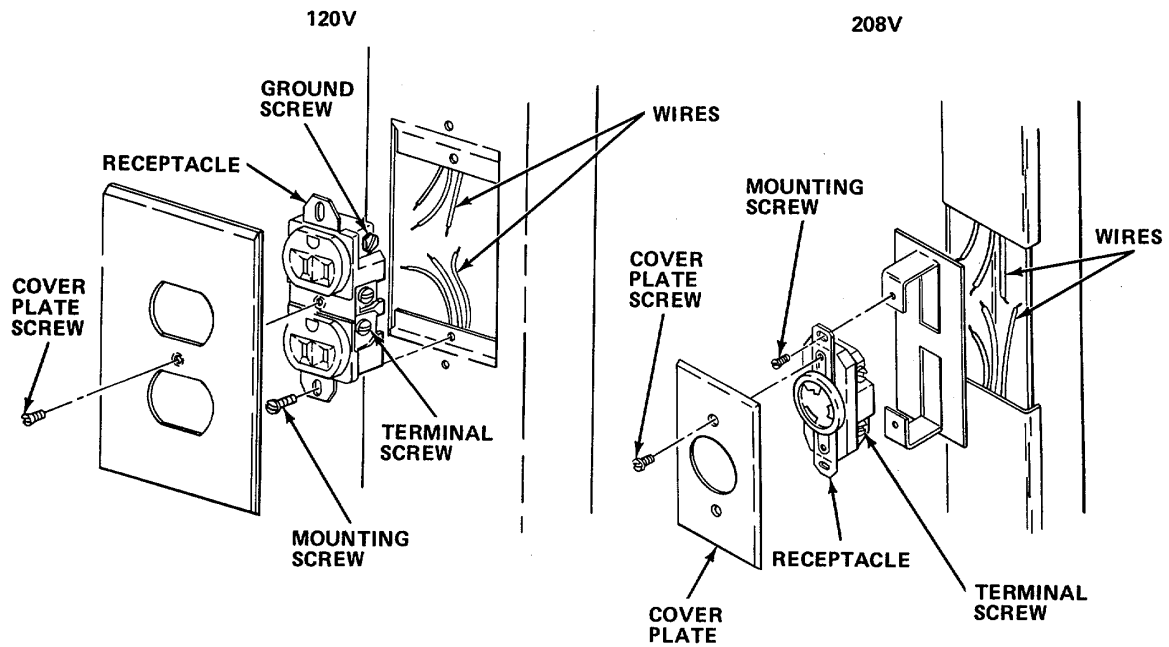
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver

SUPPLIES: Receptacle

WARNING

Death or serious injury may occur from electrical shock 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. 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.
- l. Turn on receptacle circuit breaker.

1-16.7 Replace Wire Molding.

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

TOOLS:

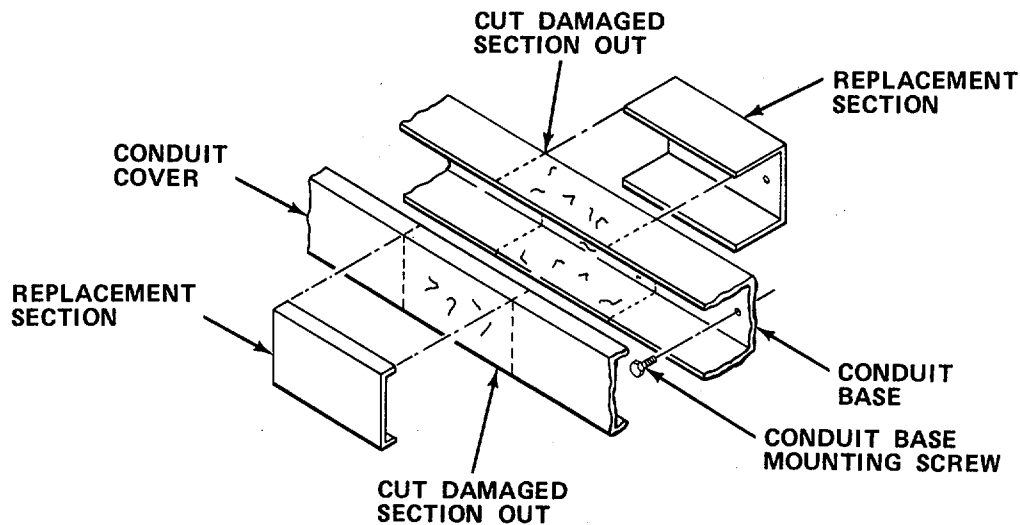
Tool Kit, Light Machine Repair

Flat Tip Screwdriver
Hacksaw
Drill
Drill Bits
File
Machinist's Rule

Electrical Repair Kit

Paint Brush
Multimeter
Flashlight

SUPPLIES: Paint (Item 37, Appendix E)
Cheesecloth (Item 14, Appendix E)
Conduit Base
Conduit Cover
Padlock

**WARNING**

Death or serious injury may occur from electrical shock 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 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.

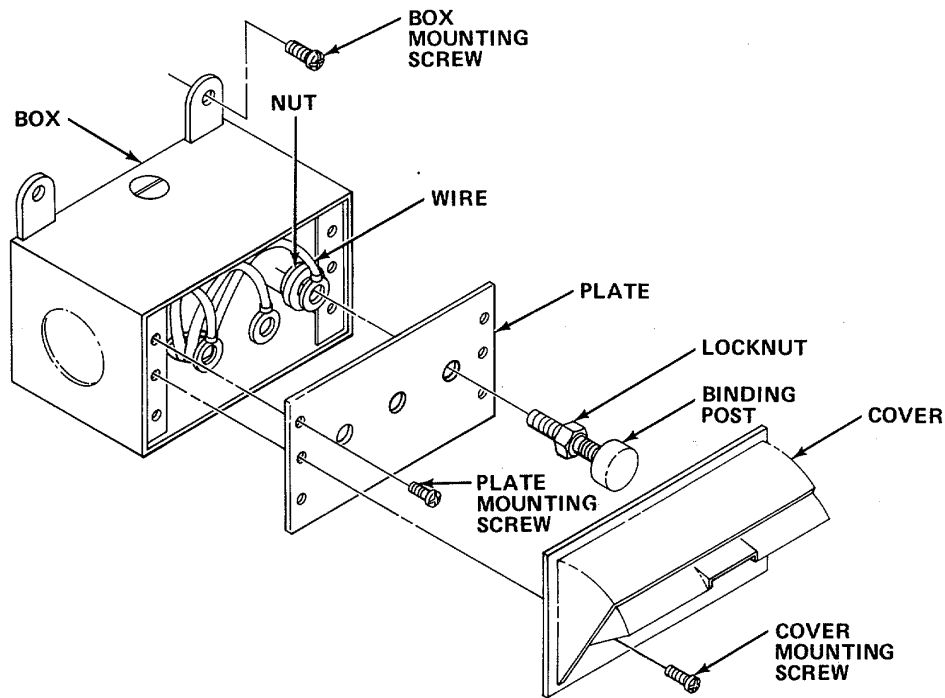
1-16.8 Repair Telephone Binding Post Assembly.

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

TOOLS:

Tool Kit, Light Machine Repair
 Cross Tip Screwdriver
 Combination Wrench Set

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
 or
 1B, Topographic Instrument Repair Specialist

TOOLS:

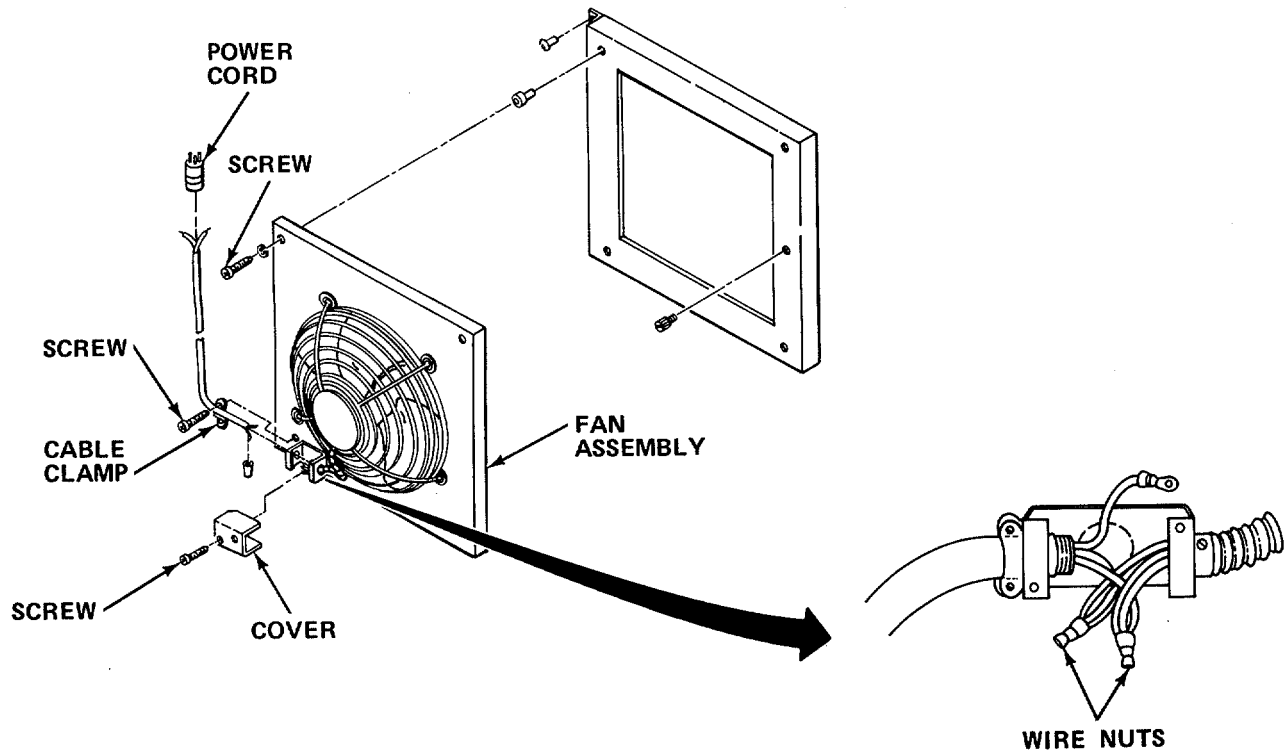
Tool Kit, Light Machine Repair
 Cross Tip Screwdriver
 Flat Tip Screwdriver
 Wire Cutters

SUPPLIES: Fan Assembly
 Wire Nuts
 Power Cord

WARNING

Death or serious injury may occur from electrical shock 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.

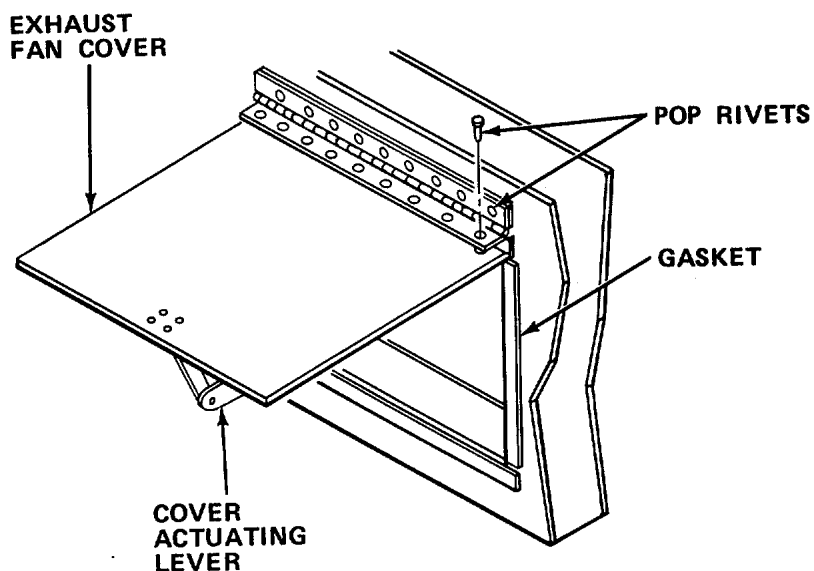
1-16.10 Replace Exhaust Fan Cover.

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

TOOLS:

Tool Kit, Light Machine Repair
 Drill
 Drill Bits
 Pop Rivet Gun
 Scraper

SUPPLIES: Pop Rivets
 Exhaust Fan Cover
 Gasket
 Solvent P-D-680 (Item 53, Appendix E)
 Adhesive (Item 2, Appendix E)
 Cheesecloth (Item 14, Appendix E)
 Impermeable Gloves
 Goggles



- a. Drill pop rivets from hinged cover to remove fan cover.
- b. Remove defective fan cover and transfer mounting 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 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
41B, Topographic Instrument Repair Specialist

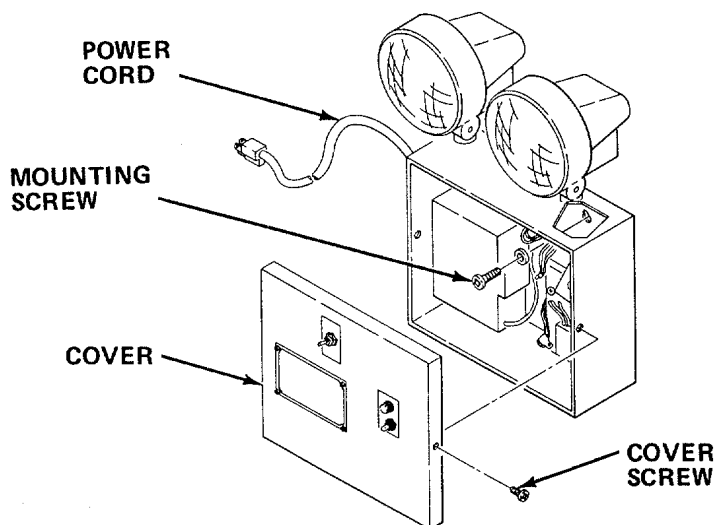
TOOLS:

Tool Kit, Light Machine Repair
Cross Tip Screwdriver
Flat Tip Screwdriver

SUPPLIES: Emergency Light Assembly.

WARNING

Death or serious injury may occur from electrical shock 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.

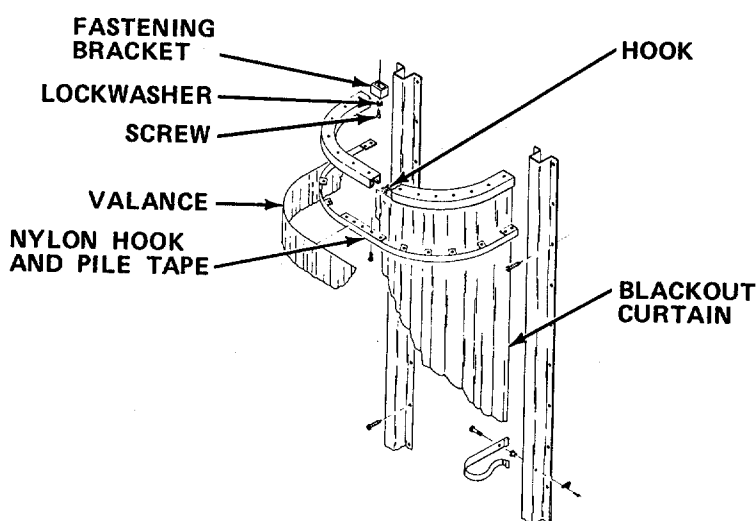
1-16.12. Repair Blackout Curtain.

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

TOOLS:

Tool Kit, Light Machine Repair
 Cross Tip Screwdriver

SUPPLIES: Hooks
 Valance
 Curtain
 Nylon Hook and Pile Tape
 Adhesive (Item 1, 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 screws 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.

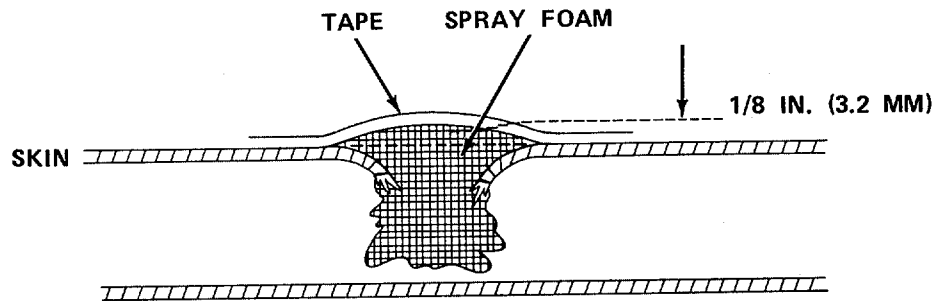
1-16.13. Repair Van Body Skin (Temporary).

MOS: 52C, Utilities Equipment Repairer

TOOLS:

Tool Kit, Service, Refrigeration Unit
 Ball Peen Hammer
 Pliers
 Utility Knife

SUPPLIES: Cloth Duct Sealing Tape (Item 58, Appendix E)
 Silicone Sealant (Item 56, Appendix E)
 Sprayfoam (Item 57, Appendix E)
 Cheesecloth (Item 14, 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. (3.2 mm) 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.

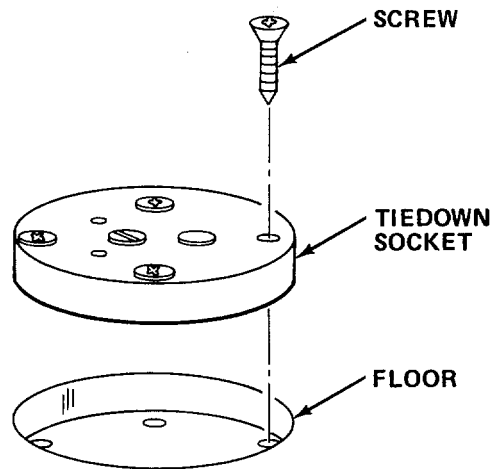
1-16.14. Replace Tiedown Socket.

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

TOOLS:

Tool Kit, Light Machine Repair
 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.

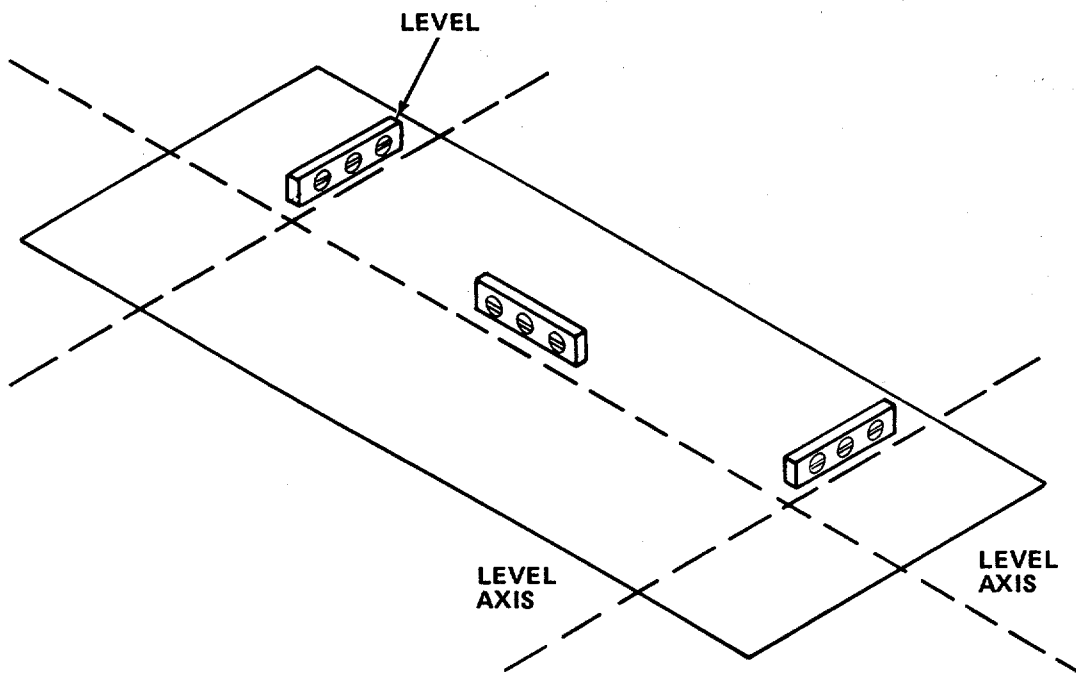
1-16.15. Repair Level Indicator.

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

TOOLS:

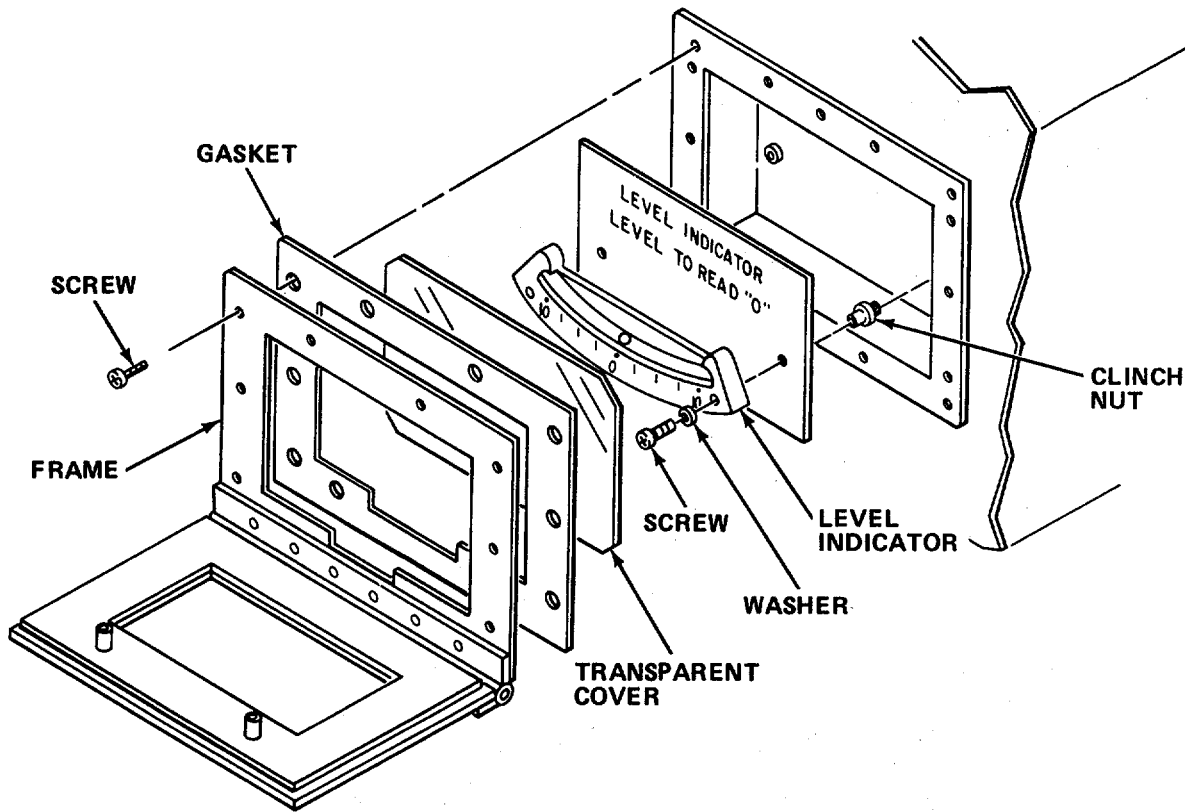
Tool Kit, Precision Instrument Repair
 Cross Tip Screwdriver
 Knife
 Carpenter's Level

SUPPLIES: Level Indicator
 Gasket



- a. Level section using level indicators. 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.

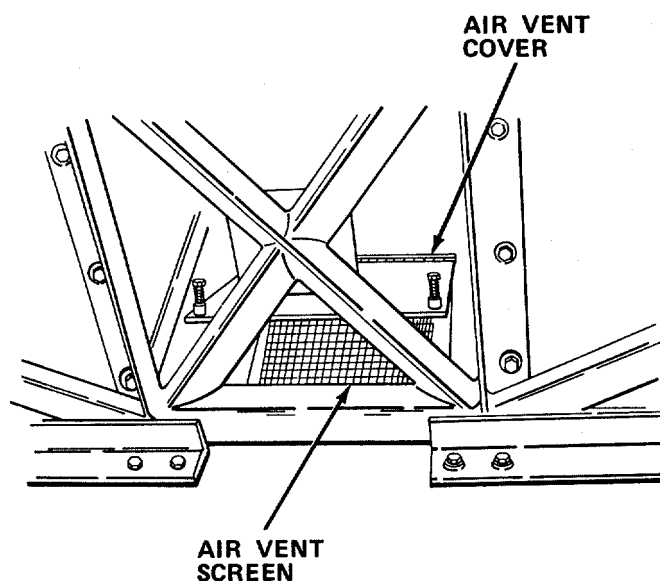
1-16.16. Replace Air Vent Screen.

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

TOOLS:

Tool Kit, Light Machine Repair
Cross Tip Screwdriver
Scissors

SUPPLIES: Rubber Adhesive (Item 1, Appendix E)
Nylon Screen (Item 50, 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.

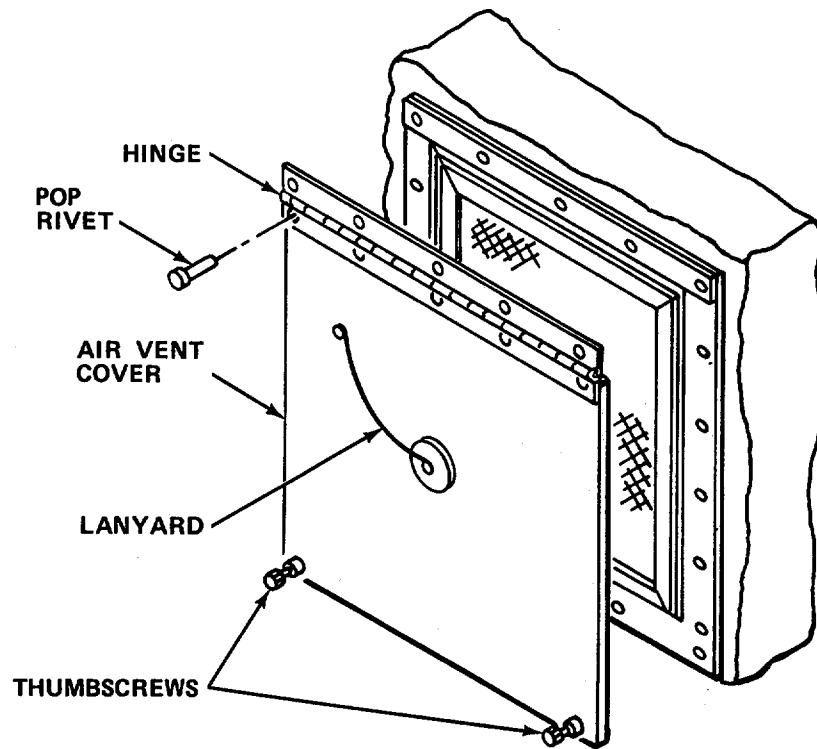
1-16.17. Replace Air Vent Cover.

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

TOOLS:

Tool Kit, Light Machine Repair
 Drill
 Drill Bits
 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.

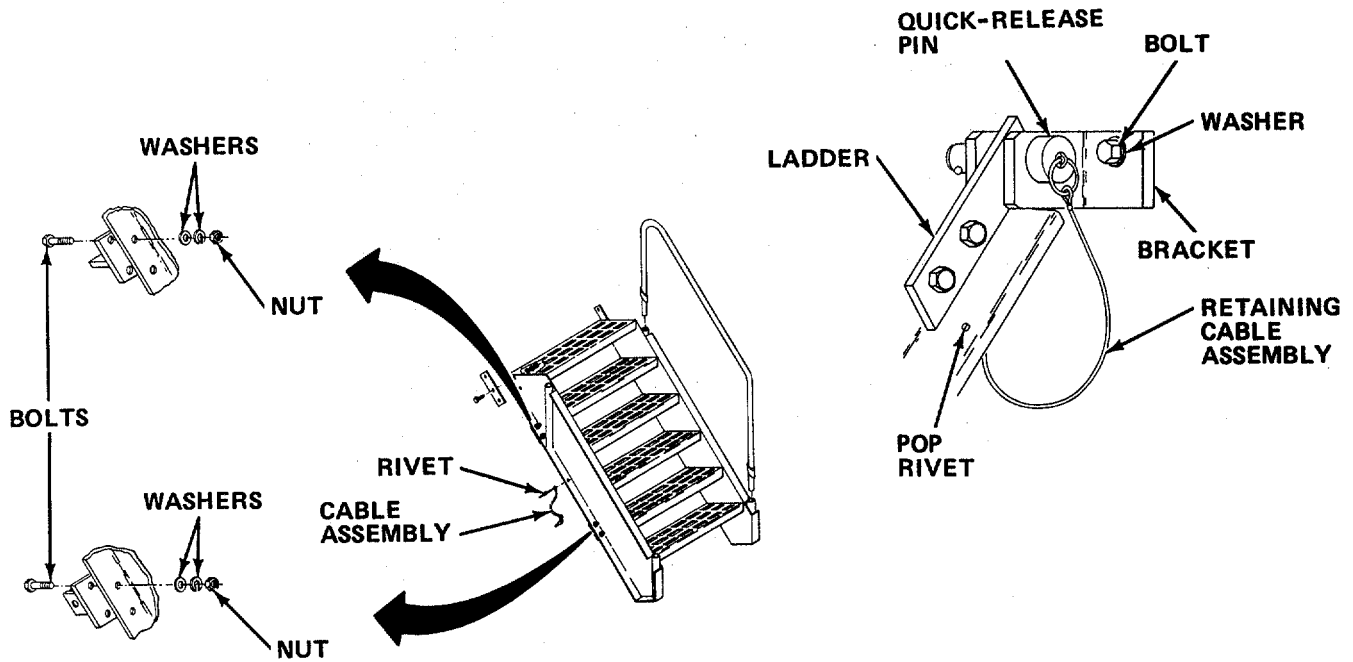
1-16.18. Repair Personnel Ladder.

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

TOOLS:

Tool Kit, Light Machine Repair
 Combination Wrench Set
 8 in. Adjustable Wrench
 Drill
 Drill Bits
 Pop Rivet Gun

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. Inventory equipment and consumable supplies against Hand Receipt Manual to be sure accountable material is contained in the section. 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 5-3610-285-24P 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.

c. For unidentified malfunctions, use 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 BODY 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.	<u>WARNING</u>	
	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.	<u>WARNING</u>	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 Photomechanical 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

PROCEDURE	PARAGRAPH
Repair Personnel Door Handle	1-20.1
Replace Cargo Door Latch Assembly	1-20.2
Replace Personnel/Cargo Door Gasket	1-20.3
Replace Personnel/Cargo Door	1-20.4
Replace Circuit Breaker	1-20.5
Repair Van Body Skin (Permanent)	1-20.6
Replace Air Conditioner/Heater	1-20.7
Replace Air Conditioner Support Bracket	1-20.8
Replace Ventilation Duct	1-20.9
Repair Floor Covering	1-20.10

1-20.1. Repair Personnel Door Handle.

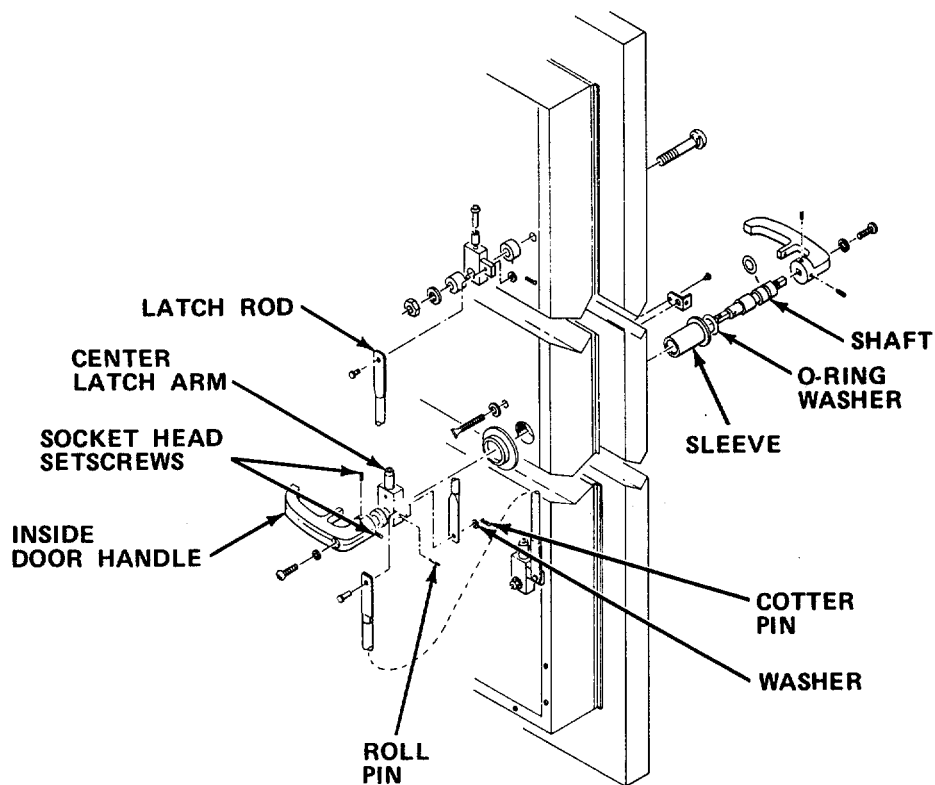
MOS: 63W, Wheel Vehicle Repairer

TOOLS:

Tool Kit, General Mechanic's, Automotive
 Cross Tip Screwdriver
 Needle Nose Pliers
 Combination Wrench set
 Socket Head Key Wrench Set
 Ball Peen Hammer
 Center Punch

SUPPLIES: O-Ring Washer

Sleeve
 Roll Pin
 Personnel Door Handle
 Cheesecloth (Item 14, Appendix E)
 Oil, Lubricating, General Purpose (Item 31, Appendix E)
 Hand Oiler
 Cotter Pin
 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 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 shaft and new 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.

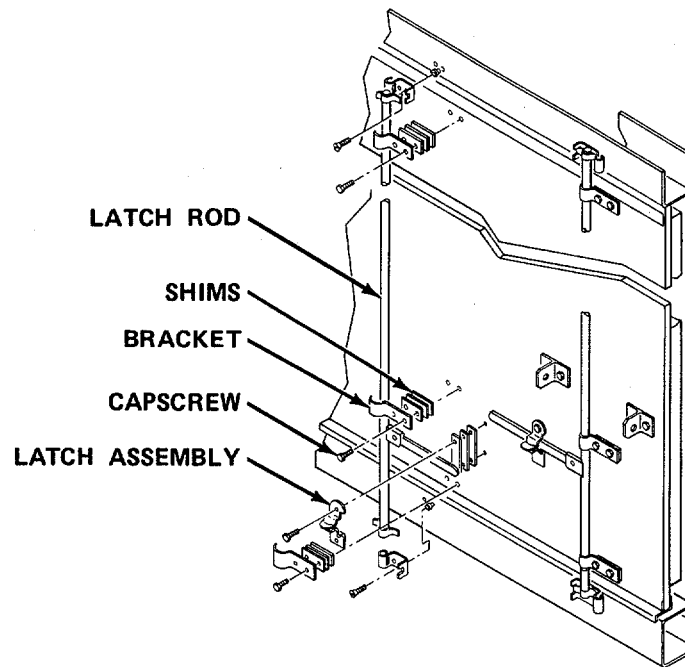
1-20.2. Replace Cargo Door Latch Assembly.

MOS: 63W, Wheel Vehicle Repairer

TOOLS:

Tool Kit, General Mechanic's, Automotive Combination Wrench Set

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.

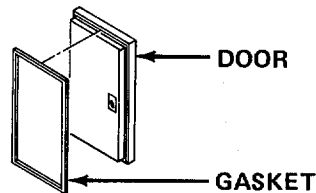
1-20.3. Replace Personnel/Cargo Door Gasket.

MOS: 63W, Wheel Vehicle Repairer

TOOLS:

Tool Kit, General Mechanic's, Automotive

SUPPLIES: Vinyl Gasket
Adhesive (Item 2, Appendix E)
Solvent P-D-680 (Item 53, Appendix E)
Impermeable Gloves
Goggles
Cheesecloth (Item 14, Appendix E)



- 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:

Tool Kit, General Mechanic's, Automotive Combination Wrench Set

Drill

Drill Bits

Rivet Gun

Hoist

Paint Brush

SUPPLIES: Personnel/Cargo Door

Pop Rivets

Vinyl Gasket

Paint (Item 36, Appendix E)

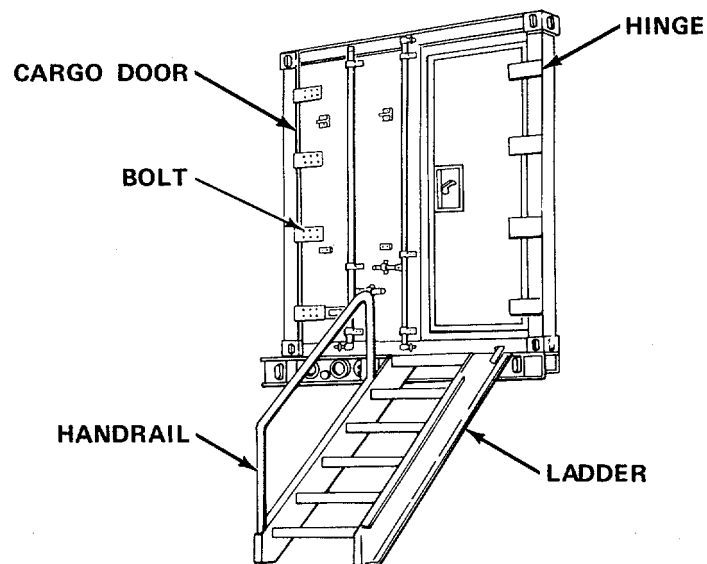
Paint (Item 37, Appendix E)

Adhesive (Item 2, Appendix E)

Cheesecloth (Item 14, Appendix E)

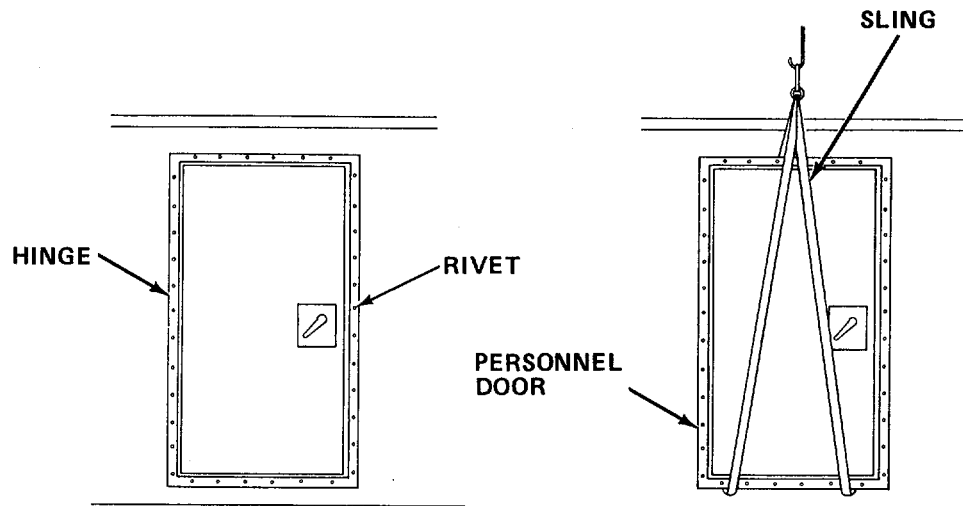
WARNING

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.

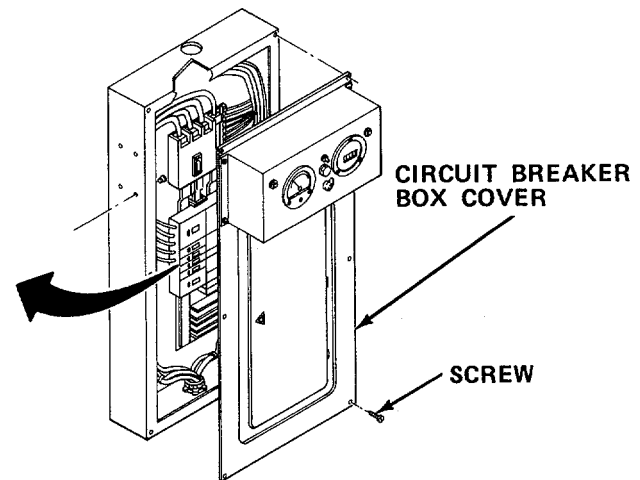
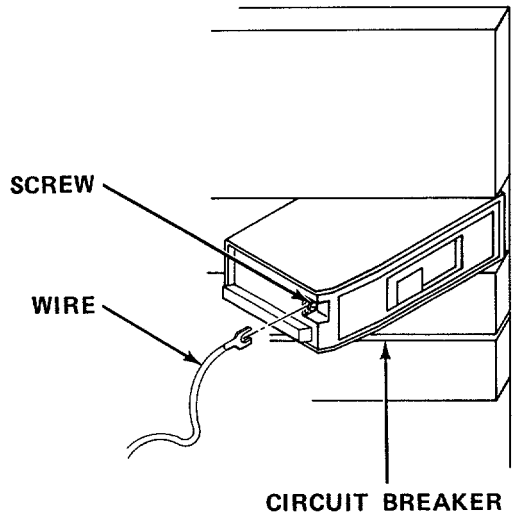
1-20.5. Replace Circuit Breaker.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

Tool Kit, Electronic Equipment
 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.

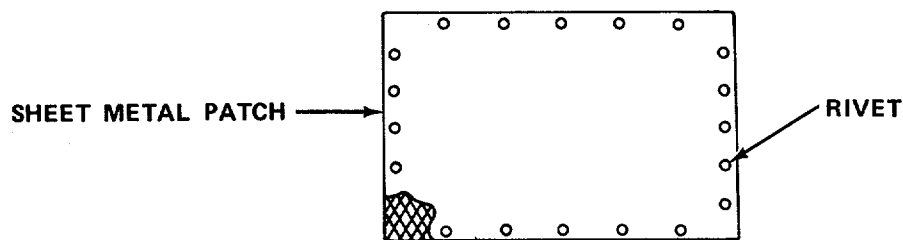
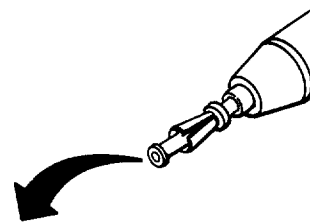
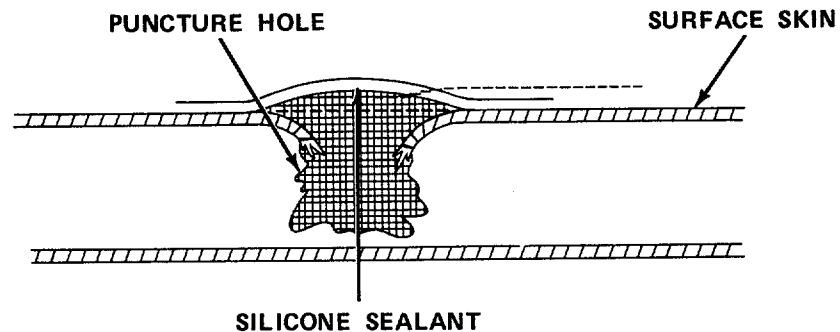
1-20.6. Repair Van Body Skin (Permanent).

MOS: 63W, Wheel Vehicle Repairer

TOOLS: Pop Rivet Gun
 Electric Drill and Bits
 Paint Brush

SUPPLIES: Pop Rivets
 Sprayfoam (Item 57, Appendix E)
 Silicone Sealant (Item 51, Appendix E)
 Sheet Metal
 Paint (Item 36, Appendix E)
 Cheesecloth (Item 14, 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.

1-20.7. Replace Air Conditioner/Heater.

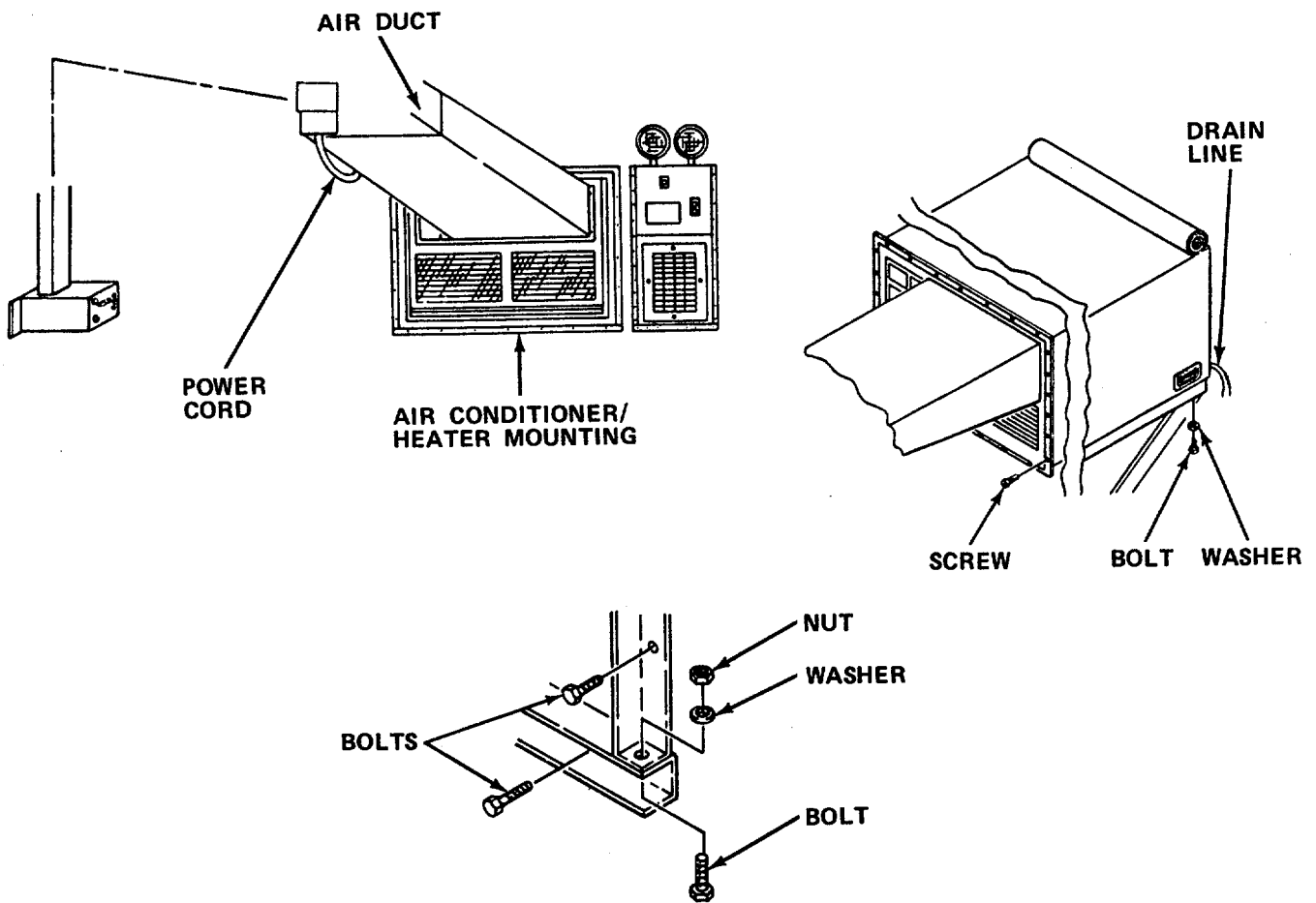
MOS: 63W, Wheel Vehicle Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS:

Tool Kit, General Mechanic's, Automotive
 Cross Tip Screwdriver
 Combination Wrench Set
 8 in. Adjustable Wrench
 Lifting Equipment

SUPPLIES: Air Conditioner/Heater
 Solvent P-D-680 (Item 53, Appendix E)
 Gasket
 Sealant (Item 51, Appendix E)
 Adhesive (Item 1, Appendix E)
 Cheesecloth (Item 14, 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 1000F to 138°F (380C to 590C).

- j. Clean sealant 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.

1-20.8. Replace Air Conditioner Support Bracket.

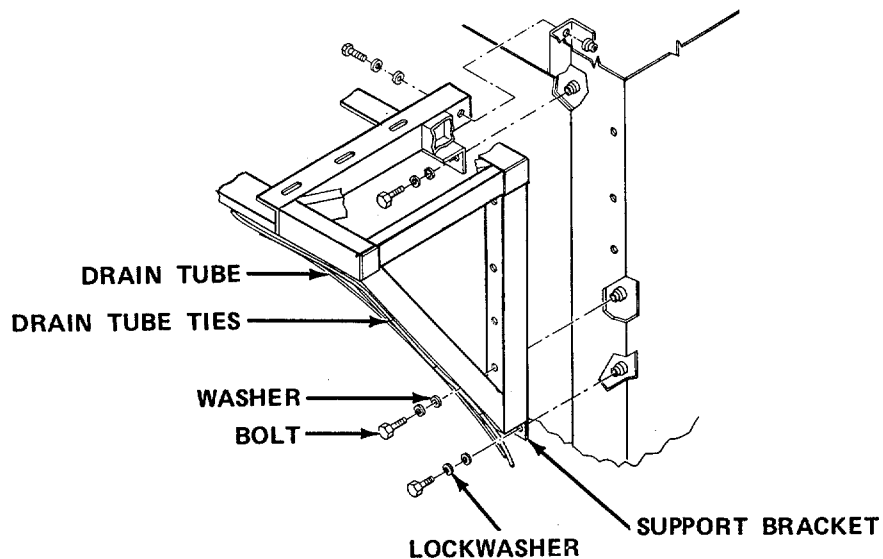
MOS: 63W, Wheel Vehicle Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS:

Tool Kit, General Mechanic's, Automotive
 Combination Wrench Set
 Knife
 Lifting Equipment

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 1-20.7).
- 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 1-20.7).

1-20.9. Replace Ventilation Duct.

MOS: 52C, Utilities Equipment Repairer

TOOLS:

Tool Kit, Service, Refrigeration Unit

Cross Tip Screwdriver

Ball Peen Hammer

Hacksaw

Drill

Drill Bits

Rivet Gun

Paint Brush

SUPPLIES: Sealant (Item 51, Appendix E)

Wood Block

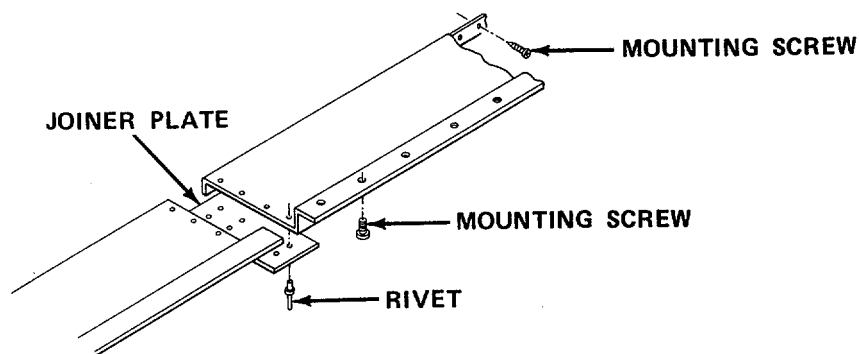
Pop Rivets

Paint (Item 37, Appendix E)

Cheesecloth (Item 14, 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.

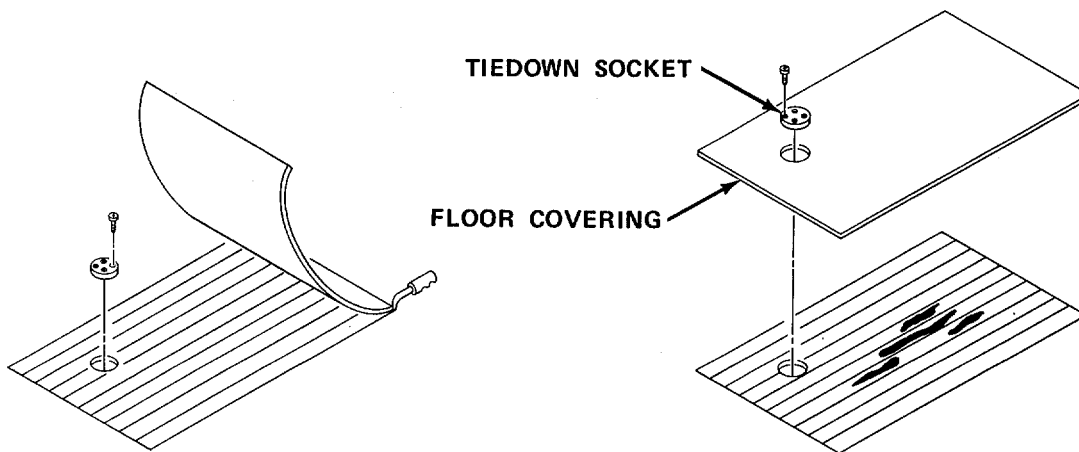
1-20.10. Repair Floor Covering.

MOS: 52C, Utilities Equipment Repairer

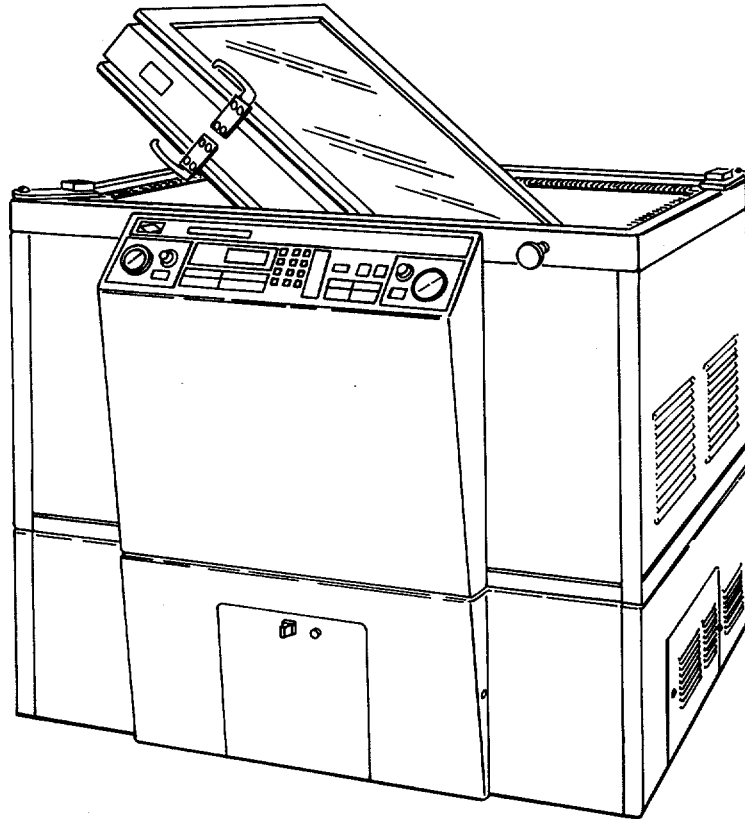
TOOLS:

Tool Kit, Service, Refrigeration Unit
 Cross Tip Screwdriver
 Utility Knife
 Scraper
 Straightedge

SUPPLIES: Vinyl Floor Covering
 Epoxy Resin (Item 49, Appendix E)
 Floor Patch (Item 20, Appendix E)
 Cheesecloth (Item 14, Appendix E)
 Adhesive (Item 1, 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.



CHAPTER 2

FLIP-TOP PLATEMAKER

Section I. INTRODUCTION

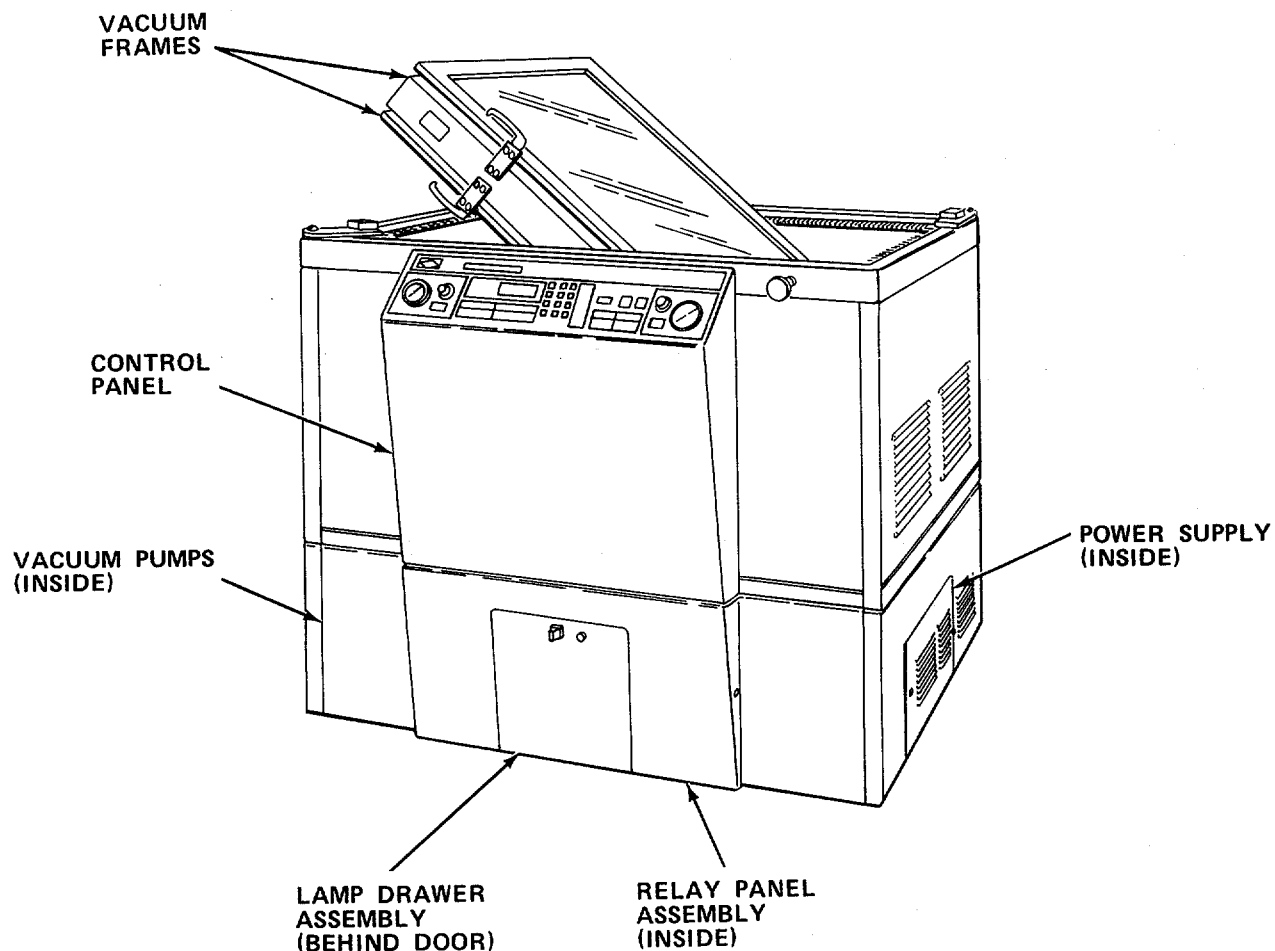
2-1. GENERAL INFORMATION.2-1.1 Scope.

- a. Model Number and Equipment Name. Model FT40V3UPNS, Flip-Top Platemaker.
- b. Purpose of Equipment. To produce offset plates from processed photographic negatives, for lithographic printing.

2-2. EQUIPMENT DESCRIPTION.2-2.1 Equipment Characteristics. Capabilities. and Features.

- a. Instant start, no shutter.
- b. Built-in light integrator.
- c. Interchangeable light source.
- d. Solid-state power supply.
- e. Back-to-back vacuum frames.
- f. One piece aluminum glass frame.
- g. Lighttight.
- h. Large LED readout.
- i. 3600 to 4500 angstrom range light coverage.

2-2.2 Location and Description of Major Components.



VACUUM PUMPS. Oil-less vacuum pumps made of cast iron with hard carbon vanes.

CONTROL PANEL. Contains the controls for operating the flip-top platemaker.

VACUUM FRAMES. Two glass vacuum frames provide nonstop production. One piece live rubber blankets with permanent molded beading. Stays soft for fast vacuum and perfect contact.

POWER SUPPLY. Provides 3000 watt output for use with exposure lamp. Solid-state construction for reliable service.

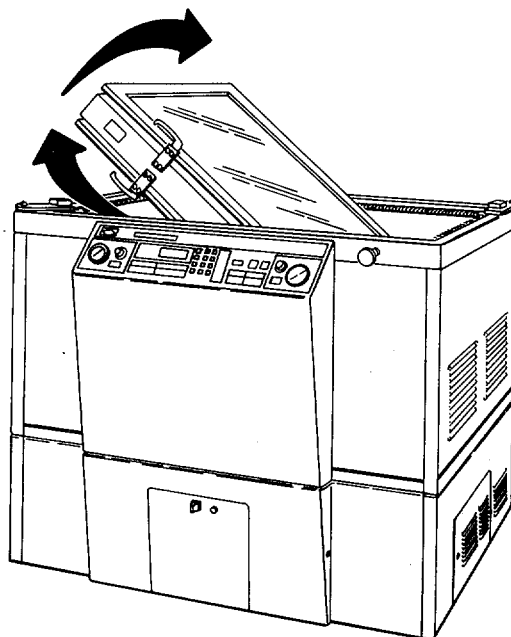
LAMP DRAWER ASSEMBLY. Provides mounting and reflectors for exposure lamp. Mounted on side to allow easy lamp replacement.

RELAY PANEL ASSEMBLY. Houses relays used with vacuum pumps and exposure lamp. Also contains fuses and master circuit breaker.

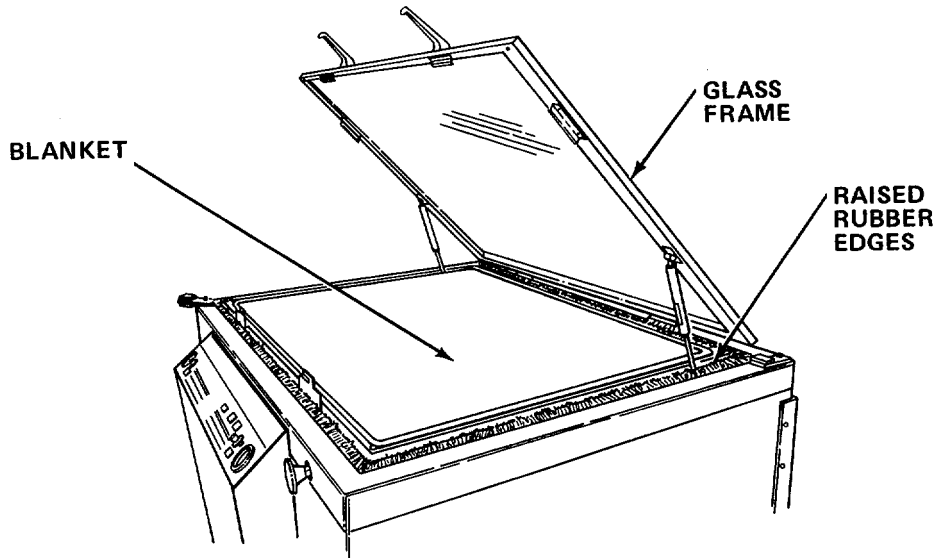
2-2.3 Equipment Data.

Power Requirements	220 V, 60 Hz, single phase, 22 amps
Vacuum Blanket Size	30 in. x 40 in. (77 cm x 102 cm)
Wattage Input to Lamp	3000 W
Dimensions	
Width	48 in. (122 cm)
Depth	48 in. (122 cm)
Height	41 in. (104 cm)
Pump Motors	
Power Output	1/6 hp
Speed	1725 rpm
Ambient Temperature	105°F (40°C)

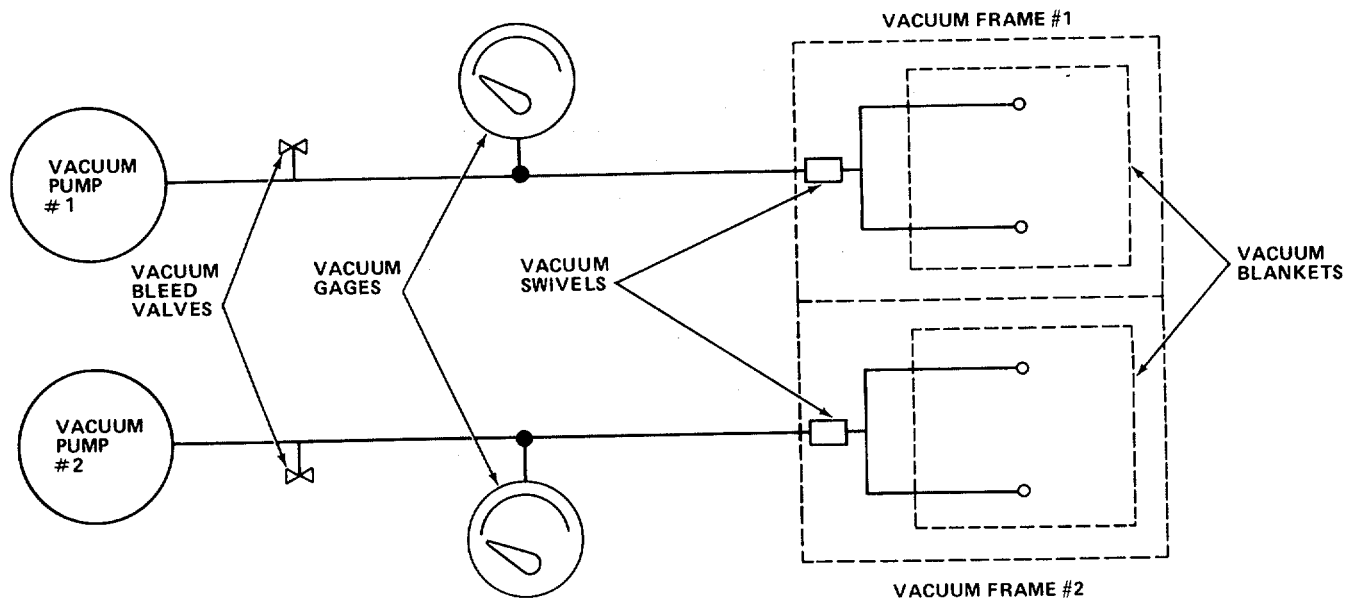
2-3. TECHNICAL PRINCIPLES OF OPERATION.



2-3.1 General. The flip-top platemaker provides for nonstop operation by exposing one side while the other side is being loaded. A built-in light integrator automatically controls exposure time in the event that the lamp intensity should vary.



2-3.2 Flip-Top Contact Vacuum Frames. Provide sturdy frames for constant use. The blankets are pliable to aid in tight contact required for plate processing. Raised rubber edges around the vacuum blankets provide an airtight seal between the glass and blanket.

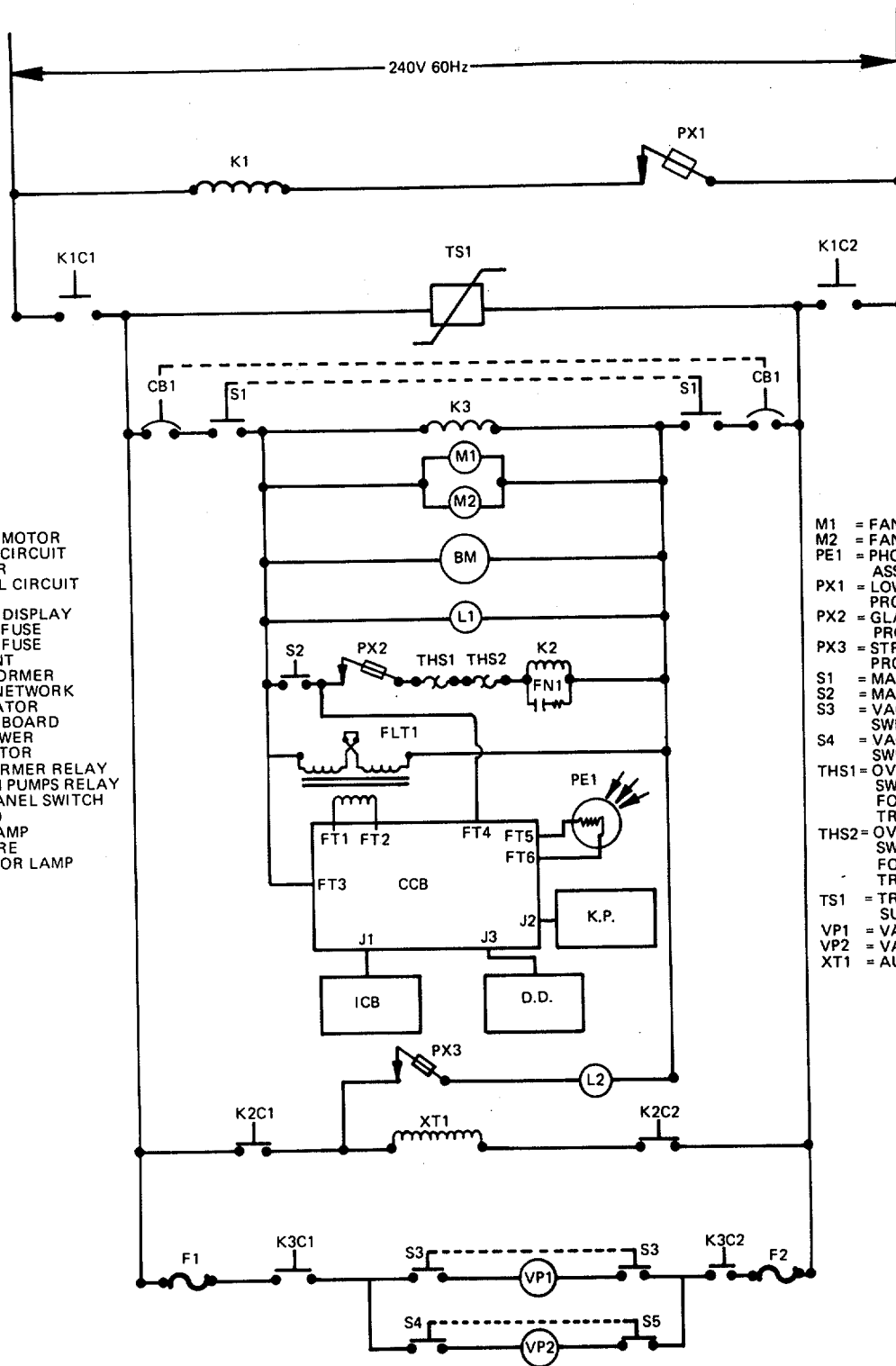


2-3.3 Vacuum Pump System. Produces the vacuum used by the vacuum frames. It is composed of the following components:

a. Vacuum pumps (2). Vacuum pumps are single pumps and motors. The outer end plate, body, rotor, and mounting bracket are all cast iron. The vanes are made of hard carbon and are precision ground. The motor is thermally protected and will automatically restart when the protector resets. (Refer to paragraph 2-3.4c for electrical description.)

b. Vacuum Gages (2). Used to indicate amount of vacuum created in vacuum frames. Indicates from 0-30 lbs. of pressure.

c. Vacuum Bleed Valves (2). Used to bleed the vacuum from the vacuum frames. Valves are needle type valves. Rotating knob to the left will open valve, to the right will close the valve. Can be used to control vacuum pressure.



- BM =BLOWER MOTOR
- CB1 =MASTER CIRCUIT BREAKER
- CCB =CONTROL CIRCUIT BOARD
- DD =DIGITAL DISPLAY
- F1 = # 8 Amp FUSE
- F2 = # 8 Amp FUSE
- FLT1 =FILAMENT TRANSFORMER
- FN1 =FILTER NETWORK
- ICB =INTEGRATOR CIRCUIT BOARD
- K1 =MAIN POWER CONTACTOR
- K2 =AUTOFORMER RELAY
- K3 =VACUUM PUMPS RELAY
- KP =MONO PANEL SWITCH KEY PAD
- L1 =PILOT LAMP
- L2 =EXPOSURE INDICATOR LAMP

- M1 = FAN MOTOR
- M2 = FAN MOTOR
- PE1 = PHOTODETECTOR ASSEMBLY
- PX1 = LOWER DOOR PROXIMITY SWITCH
- PX2 = GLASS FRAME PROXIMITY SWITCH
- PX3 = STRIKE TRANSFORMER #2 PROXIMITY SWITCH
- S1 = MASTER POWER SWITCH
- S2 = MANUAL SWITCH
- S3 = VACUUM PUMP #1 SWITCH
- S4 = VACUUM PUMP # 2 SWITCH
- THS1= OVERTEMPERATURE SWITCH (200°F) FOR STRIKE TRANSFORMER # 1
- THS2= OVERTEMPERATURE SWITCH (200°F) FOR STRIKE TRANSFORMER # 2
- TS1 = TRANSIENT SUPPRESSOR
- VP1 = VACUUM PUMP # 1
- VP2 = VACUUM PUMP # 2
- XT1 = AUTOFORMER

2-3.4 Electrical system. Consists of six subcircuits. Description of each is as follows:

a. Contactor K1 Power Circuits. With power applied to the flip-top platemaker, contactor K1 (main power contactor) will energize, provided the lower cabinet door is closed, activating proximity switch PX1. Contacts C1 and C2 of contactor K1 being closed will then apply power to the transient suppressor (TS1) which is used to suppress voltage spikes. Power is also made available to the master circuit breaker (CB1), the vacuum pump circuits, and via contacts of K2, the autoformer (XT1).

b. Master Power Switch Circuits. Power is applied to the master power switch (S1) from the master circuit breaker (CB1). Master power switch applies power to the following components:

- (1) Relay K3, used to route power in the vacuum pump circuits.
- (2) Fan Motors (M1 and M2), cooling fans for the 3kW power supply.
- (3) Blower Motor (BM), used to cool exposure lamp and cabinet interior.
- (4) Pilot Lamp (L1), indicates main power switch is on.
- (5) Exposure control circuits.
- (6) Filament Transformer (FLT1), used to supply 12 V ac to control circuit board.

c. Vacuum Pump Circuits. Power for the circuits comes from contactor K1 (main power contactor) contacts. Power is routed through fuses F1 and F2, contacts C1 and C2 of relay K3 (vacuum pumps relay), then through the appropriate vacuum pump switch (S3 or S4), to the vacuum pump. Relay K3 is energized when the master power switch (S1) is on.

d. Exposure Control Circuits. The exposure control circuits are used to energize relay K2 (autoformer relay), which energizes the autoformer. Relay K2 can be energized manually or automatically. For manual operations, power from the master power switch (S1) is routed to the manual switch (S2). With the manual switch closed, power is routed through two overtemperature switches (THS1 and THS2) and the glass frame proximity switch (PX2) to energize relay K2. Overtemperature switches are set at 200°F (93.3°C) and are mounted next to the strike transformers in the power supply circuits. They open in the event that the temperature around the strike transformers reaches 200°F (93.3°C). The glass frame proximity switch is closed when the vacuum frame is locked in its horizontal position. For automatic operation, relay K2 is energized in the same manner as in manual operation. Instead of power coming through switch S2 to THS2, power comes from the electronic circuits. These circuits are comprised of the following components:

(1) Photodetector Assembly (PE1). Used to detect the intensity of the exposure lamp. It is wired into the control circuit board. The more intense the light, the less resistance applied, which affects exposure time.

(2) Monopanel Switch Keypad (KP). Used to input units of light to be used during exposure. Contains digits 0-9, a "C" key, used to cancel any exposure in progress or to cancel any information entered, prior to pressing the "T" key. The "T" key is used to activate the exposure. The keypad is wired into the control circuit board.

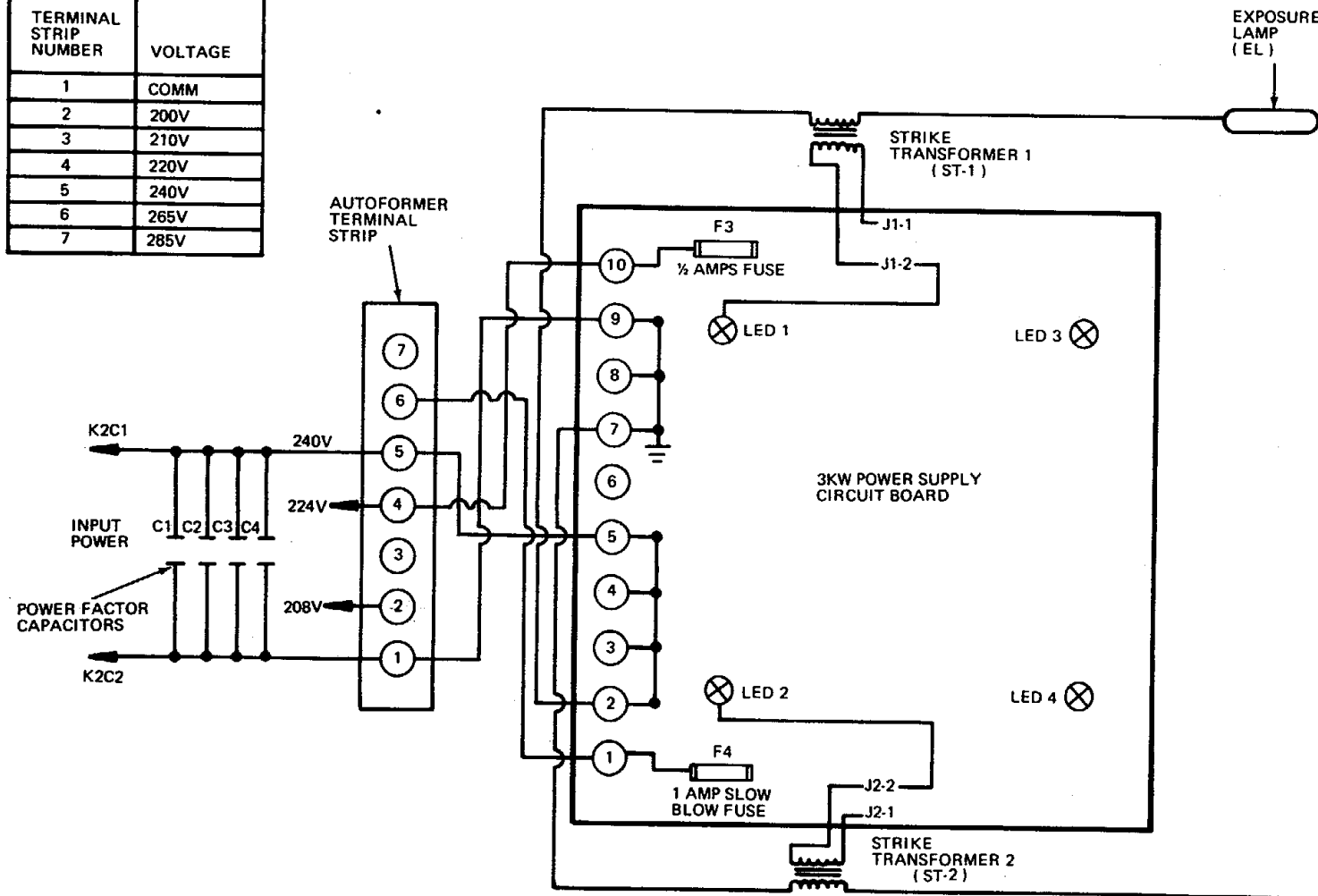
(3) Digital Display (DO). Used to display the units of light entered via the key pad. During exposure, the digital display will count down. At the end of the exposure, the display will return to the units of light that were originally entered. The digital display is wired into the control circuit board.

(4) Integrator Circuit Board (ICB). Used to control the exposure time based on the units of light entered and the intensity of the lamp based on input from photodetector assembly (PE1). It is mounted directly onto the control circuit board.

(5) Control Circuit Board (CCB). Receives inputs from other circuits. Contains an electronic relay which is used to apply power to relay K2, via the overtemperature switches (THS1 and THS2) and glass frame proximity switch (PX2).

e. Exposure Indicator Lamp (L2). Power is received through proximity switch PX3. PX3 is located next to strike transformer #1 (ST-1) and is activated whenever ST-1 is energized.

TERMINAL STRIP NUMBER	VOLTAGE
1	COMM
2	200V
3	210V
4	220V
5	240V
6	265V
7	285V



- LED 1 : LIT WHEN STRIKE PULSES ARE GENERATED FOR ST 1.
- LED 2 : LIT WHEN STRIKE PULSES ARE GENERATED FOR ST 2.
- LED 3 : OFF IF INPUT VOLTAGE IS TOO HIGH
- LED 4 : OFF IF INPUT VOLTAGE IS TOO LOW.

f. Power Supply Circuit. Provides 3000 watts of power to the exposure lamp. It is comprised of the following components:

(1) Autoformer (XT1). A step up/down transformer used to supply power to the strike transformers and the 3kW power supply circuit board. Receives power via contacts C1 and C2 of the autoformer relay (K2).

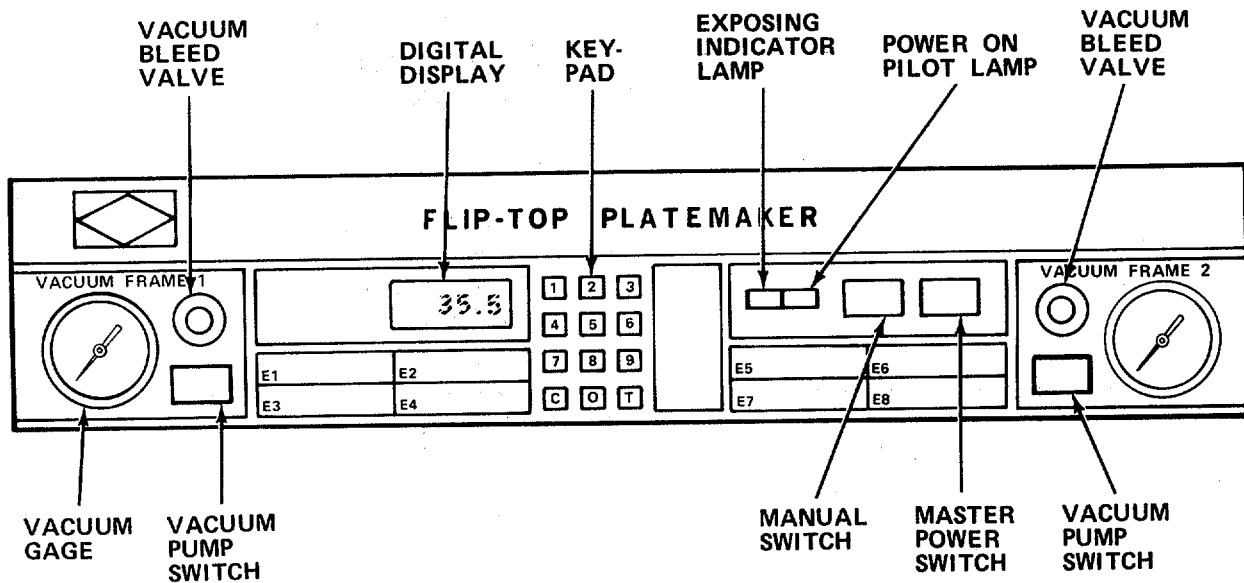
(2) Power Factor Capacitors (C1-C4). Provide for filtering and stabilization of input power to autoformer.

(3) 3kW Power Supply Circuit Board. Receives power from autoformer. Monitors input line voltage and will shut down if input power is too high or too low. Contains circuits for detecting phasing and generating trigger pulses. These trigger pulses are used in the high voltage strike pulse generator circuits. The high voltage strike pulse generator circuits apply high voltage pulses to the strike transformers. Four LEDs on circuit board indicate operation. Two fuses provide circuit protection.

(4) Strike Transformers (ST-1 and ST-2). Generate the 3000 watts used by the metal halide exposure lamp. The secondary sides of the transformers are wired to input power and to the exposure lamp. The primary sides are wired directly into the 3kW power supply circuit board.

Section II. OPERATING INSTRUCTIONS

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



CONTROL OR INDICATOR	FUNCTION
Vacuum Gages (2)	Indicate vacuum pressure in the vacuum frames. Scaled from 0-30 lbs.
Vacuum Pump Switches (2)	Apply power to the vacuum pumps.
Vacuum Bleed Valves (2) -	Used to relieve or adjust the vacuum pressure.
Digital Display	Displays units of light entered. Counts down during exposure. Returns to entered units of light at end of exposure.
Keypad	Used to enter units of light to be used for exposure. Contains digits 0-9. "C" key is used to cancel entered numbers or operation in progress, prior to pressing the "T" key. The "T" key is used to start exposure process.
EXPOSING Indicator Lamp	Indicates exposure in progress.
POWER ON Lamp	Indicates master POWER switch is on.
MANUAL Switch	Used for manual control of exposure time.
Master POWER Switch	Applies power to control circuits, fan motors and blower.
Frame Release Knob	Used to unlock and lock vacuum frames. Pulling knob out allows frames to be rotated.
Master Circuit Breaker	Circuit breaker for control circuits. Located behind lower cabinet door.

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

<u>Item</u>	<u>Quantity</u>
Glass Cleaner (Item 11, Appendix E)	ar
Cheesecloth (Item 14, Appendix E)	ar

Table 2-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

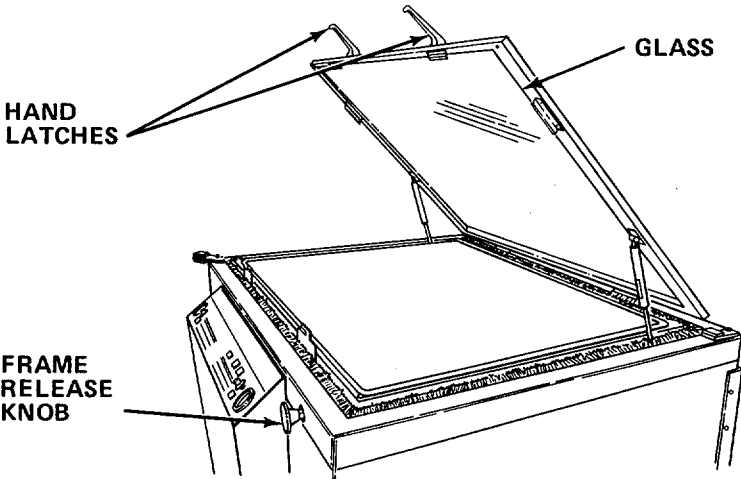
If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

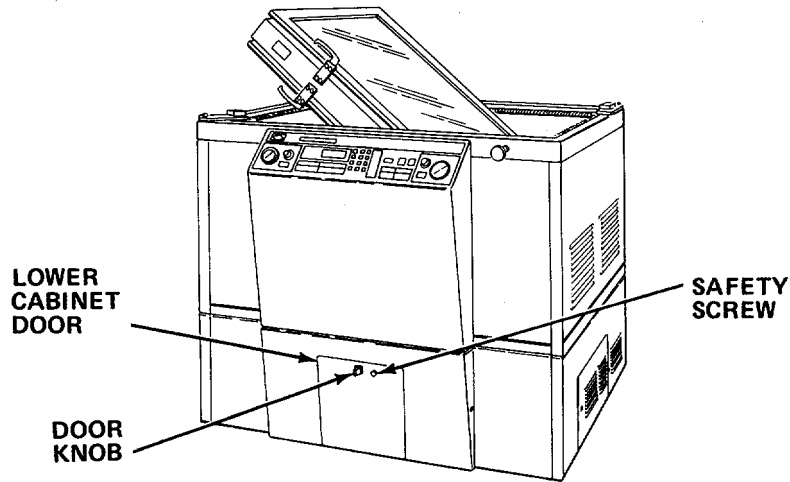
AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
1	B	<p><u>FLIP-TOP PLATEMAKER</u> <u>Clean Glass.</u></p>  <ol style="list-style-type: none"> 1. Use cheesecloth moistened with glass cleaner to clean top of glass surface. 2. Unlock the left- and right-hand latches and lift glass frame until the two lift arms take hold and open frame completely. 3. Use cheesecloth moistened with glass cleaner to clean underside of glass surface. 4. Lower glass frame and lock the left- and right-hand latches in place. 5. Pull out frame release knob and flip glass frame over and lock into place. 6. Repeat steps 1-4 for second glass frame. 	

2-6. OPERATION UNDER USUAL CONDITIONS.

2-6.1 Assembly and Preparation for Use.

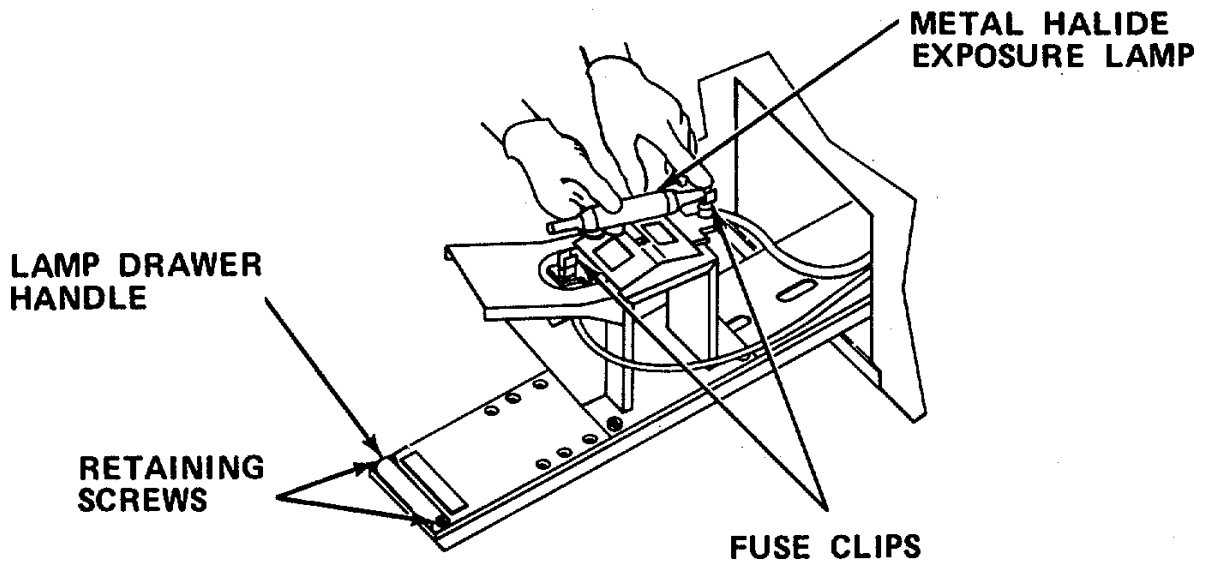


WARNING

Death or serious injury may occur unless circuit breaker and platemaker main POWER switch are off before servicing.

- a. Turn off platemaker main POWER switch and circuit breaker.
- b. Rotate two vacuum frame holddown brackets on corners.
- c. Installation of metal halide exposure lamp.

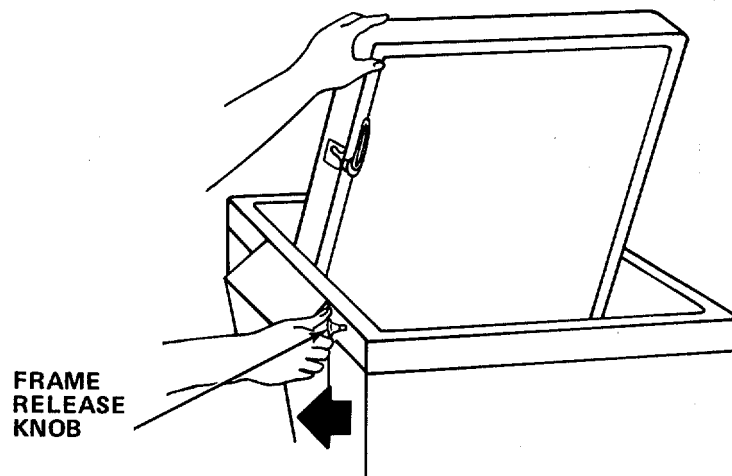
- (1) Remove safety screw from lower cabinet door.
- (2) Turn door knob and open lower cabinet door.



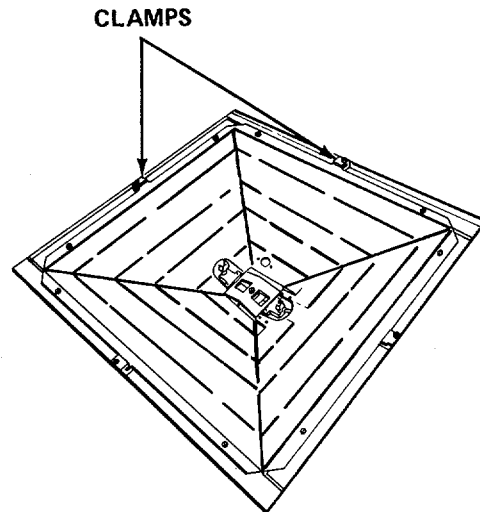
- (3) Remove two retaining screws from each side of lamp drawer handle.
- (4) Pull drawer out as far as it will go.
- (5) Wearing white gloves, install metal halide exposure lamp into fuse clips.
- (6) Slide lamp drawer all the way back into cabinet.
- (7) Reinstall two retaining screws to hold drawer in place.
- (8) Close lower cabinet door and turn door locking knob to lock door.
- (9) Reinstall safety screw on lower cabinet door.

d. Installation of glass light shield.

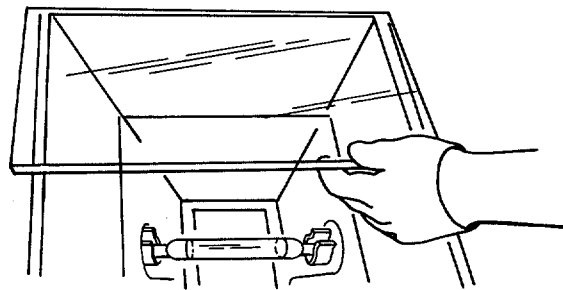
CAUTION
Glass light shield must be installed or lamp will overheat .



- (1) Pull the frame release knob out and flip glass frame into a vertical position.



- (2) Reaching down through top of unit, remove two hex head screws and clamps from each side of reflector.
- (3) Carefully remove glass light shield from glass holder on wall.
- (4) Use cheesecloth moistened with glass cleaner to clean both sides of glass surface.



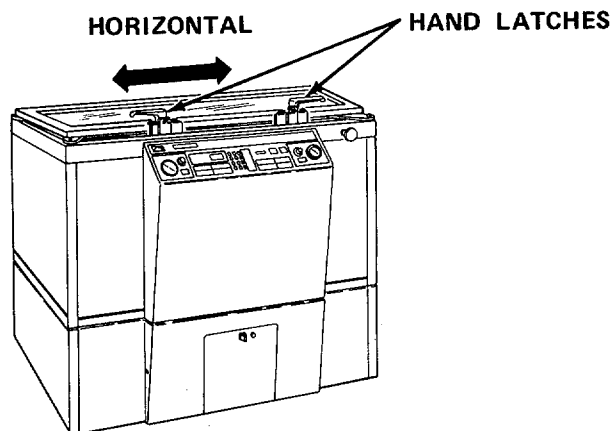
CAUTION

To prevent damage to equipment, two persons are required to reinstall glass light shield.

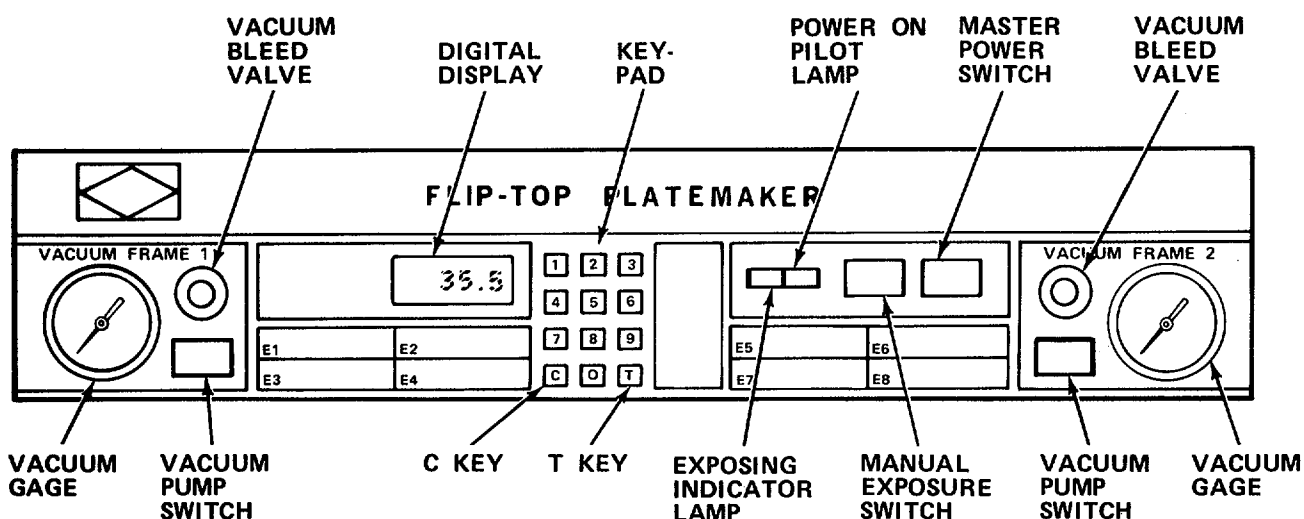
- (5) Using white gloves, carefully set glass light shield into position over the exposure lamp and reflector.
- (6) Reinstall glass clamps and hex head screws.
- (7) Rotate glass frame into its horizontal position and lock into place with frame release knob.
- (8) Turn on circuit breaker and platemaker main power switch.

2-6.2 Initial Adjustments. Daily Checks. and Self Tests.

- a. Turn on power panel circuit breaker.



- b. Be sure glass frame is in its horizontal position and locked in place.
- c. Be sure left- and right-hand latches are locked in place.

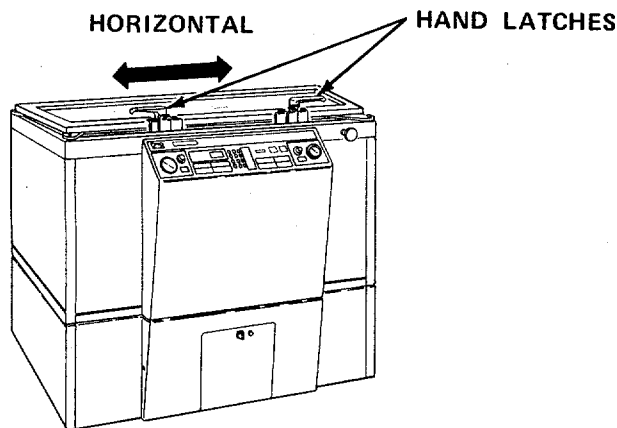


- d. Press master POWER switch on and verify that fan motors, blower motor and POWER ON pilot lamp are on.
- e. Verify vacuum bleed valve for vacuum frame in the up position is closed.
- f. Press vacuum pump switch for vacuum frame in the up position.
- g. Verify vacuum is created in vacuum frame by observing appropriate vacuum gage.
- h. Verify vacuum builds up until needle reaches the green area of the gage (approximately 25 pounds).

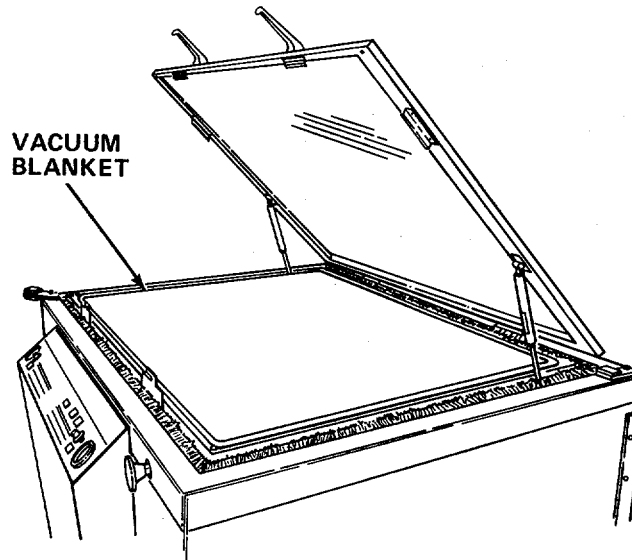
- i. Press manual exposure switch and verify that exposing indicator lamp lights, and observe that light source is visible through light security brush.
- j. Press off manual exposure switch.
- k. Press numerical keys on keypad to enter 10.0 units of light. Verify 10.0 appears on digital display.
- 1. Press "T" key on keypad to activate the exposure. Verify that digital display counts down, and that exposing indicator lamp lights.
- m. When exposure is complete, verify that exposing indicator lamp goes off and that digital display shows 10.0.
- n. Press off appropriate vacuum pump switch.
- o. Open appropriate vacuum bleed valve and verify vacuum is exhausted.
- p. Pull out on frame release knob; flip glass frame over and lock in place.
- q. Repeat steps e - o for other vacuum frame.

2-6.3 Operating Procedures.

- a. Turn on power panel circuit breaker.



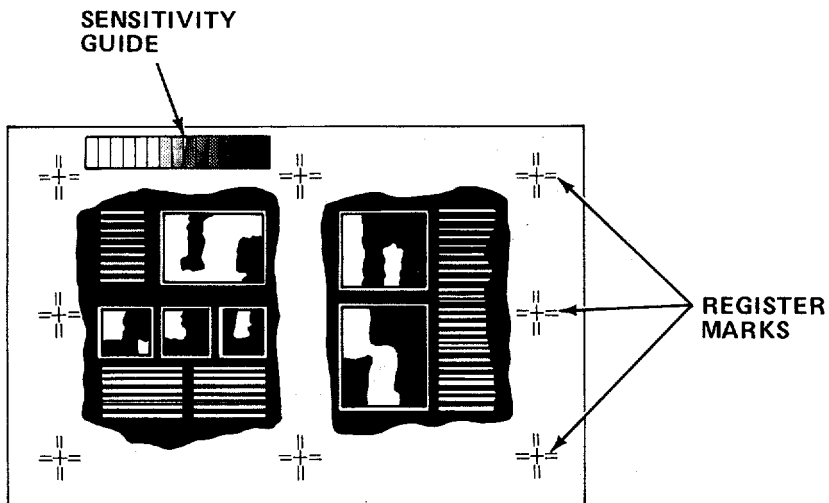
- b. Be sure glass frame is in horizontal position and locked in place.
- c. Unlock the left- and right-hand latches and lift glass frame until the two lift arms take hold and open frame completely.
- d. Verify glass is clean on both sides.



e. Make sure that vacuum blanket is clean and that vacuum exhaust holes remain uncovered.

NOTE

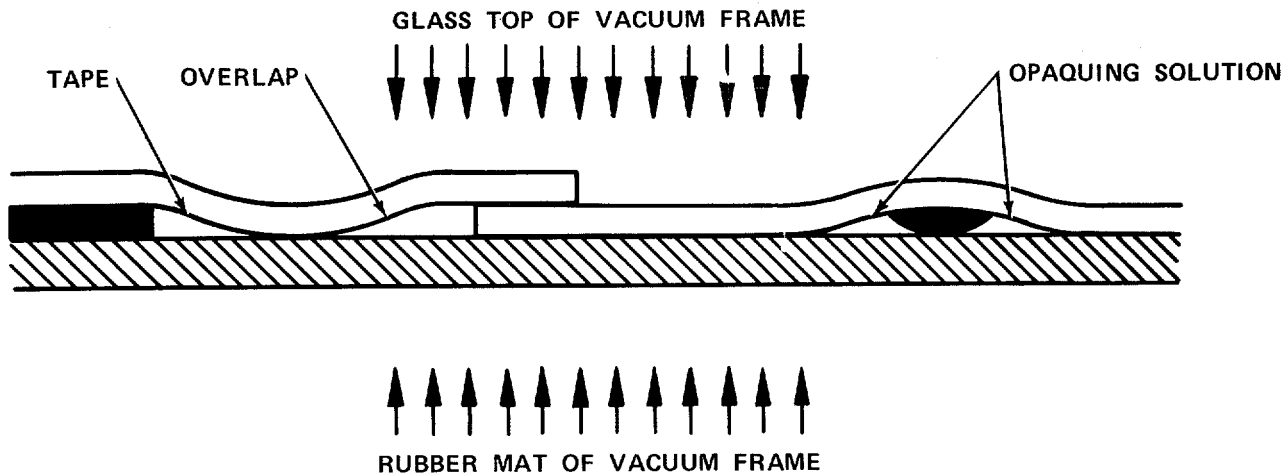
- If additional flats are to be exposed on the same plate, or if the plate is to be used for multiple color printing, register marks should be inserted in the flats, or some sort of register system should be used to register the job. Register marks are placed so they expose the plate outside the image area, so they can be trimmed off after the job is printed.
- The sensitivity guide is designed to overcome the problem of incorrect exposure. The guide is stripped into the edge of the flat in a nonprinting area, usually the outer edge.



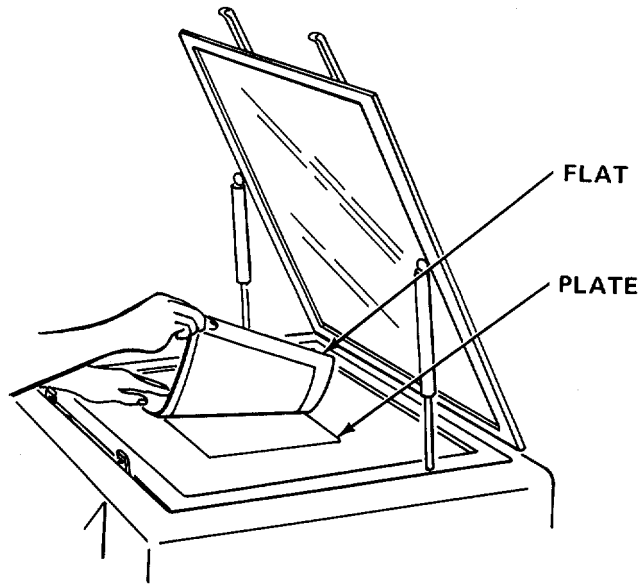
f. Strip a sensitivity guide into the edge of the flat.

NOTE

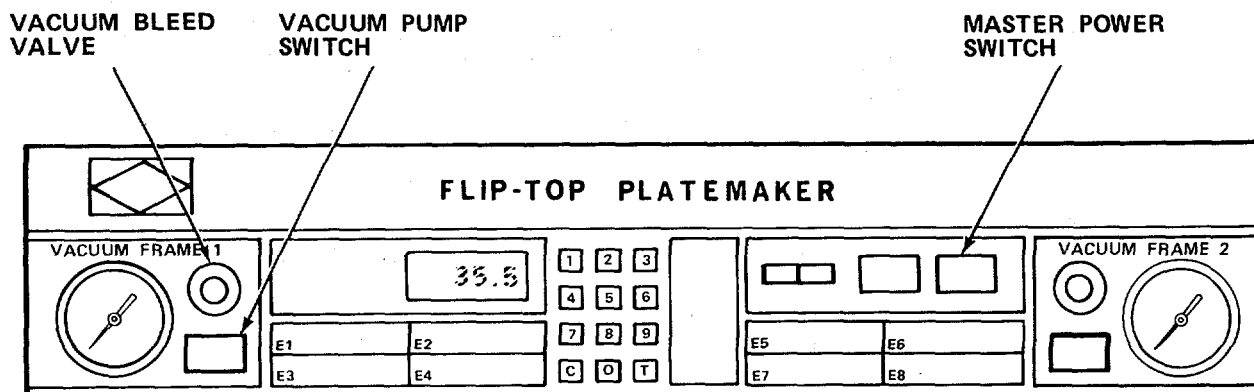
- Standard masking materials should always be used in making the flat. These are materials that will prevent the exposing light going through to the plate. In the stripping procedure on the light table, however, film can be read through the masking sheet. The film contained in the flat should be free of pinholes, dust, dirt, and tape adhesive residue.
- Since the plate must pick up fine detail such as fine halftone dots, the plate will also reproduce pinholes, opaquing, and dust specks on the image area. Pinholes should be covered with opaquing solutions prepared for this purpose. Film should be cleaned with film cleaner or an anti-static brush.



- Poor contact with plate will result if excess tape is used, or if pieces of film are overlapped. Opaquing solutions for covering pinholes should be properly thinned. A solution that is too thick will prevent perfect contact.
 - Handle flats and plates carefully to avoid kinks and creases that will result in poor contact points. Lift flats and plates by opposite corners to help prevent kinking and scratching.
 - Avoid fingerprints on film and plates.
 - Handle films and plates only under lights recommended by manufacturer.
- g. Place presensitized surface plate on vacuum blanket.



- h. Place flat on top of plate, using your register system, or aligning the flat with the lead edge of the plate.
- i. Lower glass frame and lock left- and right-hand latches in place.



- j. Be sure that vacuum bleed valve for loaded vacuum frame is closed.
- k. Press master POWER switch, if not already on.
- l. Press vacuum pump switch for loaded vacuum frame.

NOTE

Watch the effect of the vacuum on flat and plate. If air pockets form, release the vacuum by opening the bleed valve and start again.

- m. Wait for the vacuum to build up until needle reaches the green area of the gage (approximately 25 pounds).
- n. Pull out on frame release knob and flip glass frame over to face exposure lamp and lock in place.

NOTE

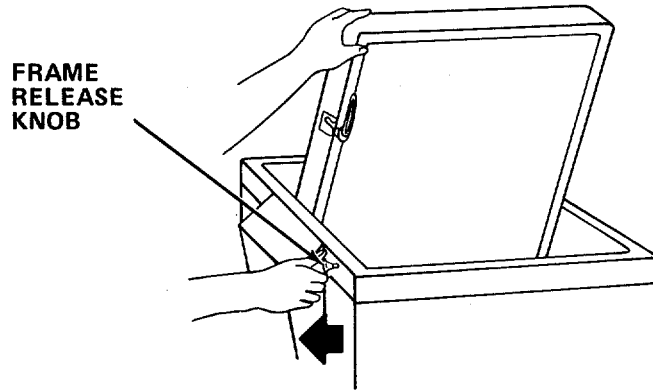
"Units of light" or "light units" refers to the amount of light needed to expose a particular material. Following plate manufacturer's recommendations for the specific type of plate used, and for the nature of the material being exposed, will yield consistent, excellent results. Correct use of the sensitivity guide aids in determining and checking proper exposure times. 30 units of light is a good starting point.

- o. Press numerical keys on keypad to enter necessary units of light.
- p. Verify that digital display reads correct units of light.
- q. Press "T" key on keypad to activate the exposure. Verify that digital display counts down and that exposure indicator lamp lights.
- r. If a second plate is to be produced, repeat steps c - m to prepare second vacuum frame while first frame is being exposed.

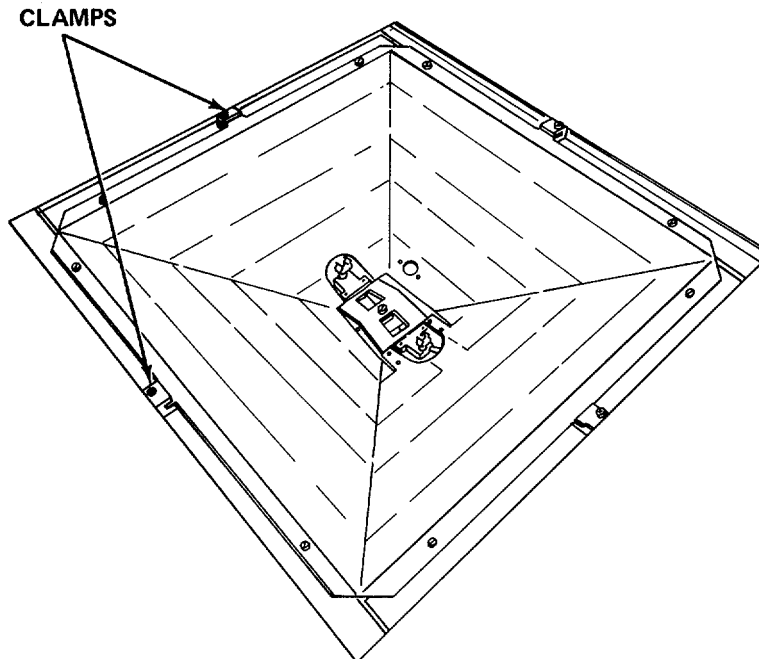
- s. When exposure is complete, pull out on frame release knob and flip glass frame over so that second vacuum frame faces exposure lamp and lock in place.
- t. If a second plate is being produced, perform steps o - q before continuing.
- u. Press off vacuum pump switch for newly exposed plate.
- v. Open bleed valve to bleed off vacuum for vacuum frame on top.
- w. Unlock left- and right-hand latches and lift glass frame until the two lift arms take hold and open the frame completely.
- x. Carefully remove and separate flat from plate. Store flat in a safe place.
- y. Process newly exposed plate.
- z. If more plates are to be processed, repeat steps c - m to prepare vacuum frame.
- aa. If second plate is being processed, repeat steps s - x to finish second plate.
- ab. If all plate processing is complete, press off master POWER switch.

2-6.4 Preparation for Movement.

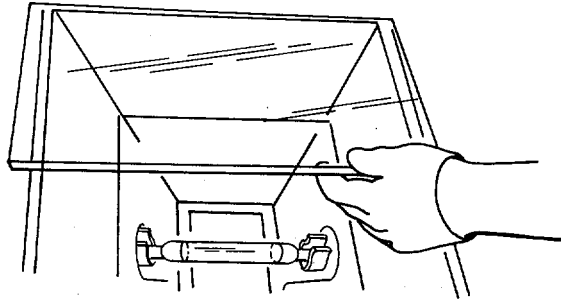
- a. Turn off power panel circuit breaker.
- b. Open glass holder on inside cargo door.
- c. Removal of glass light shield:



(1) Pull frame release knob out and flip glass frame into a vertical position.



(2) Reaching down through the top of unit, remove two hex head screws and clamps from each side of glass shield.

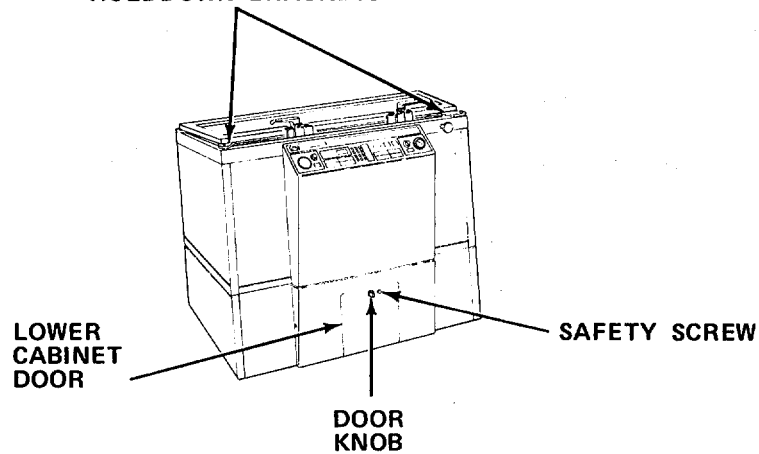


WARNING

If platemaker has been used recently, the glass light shield will be extremely hot, and may cause serious burns. To prevent injury, use gloves or rags when removing glass light shield.

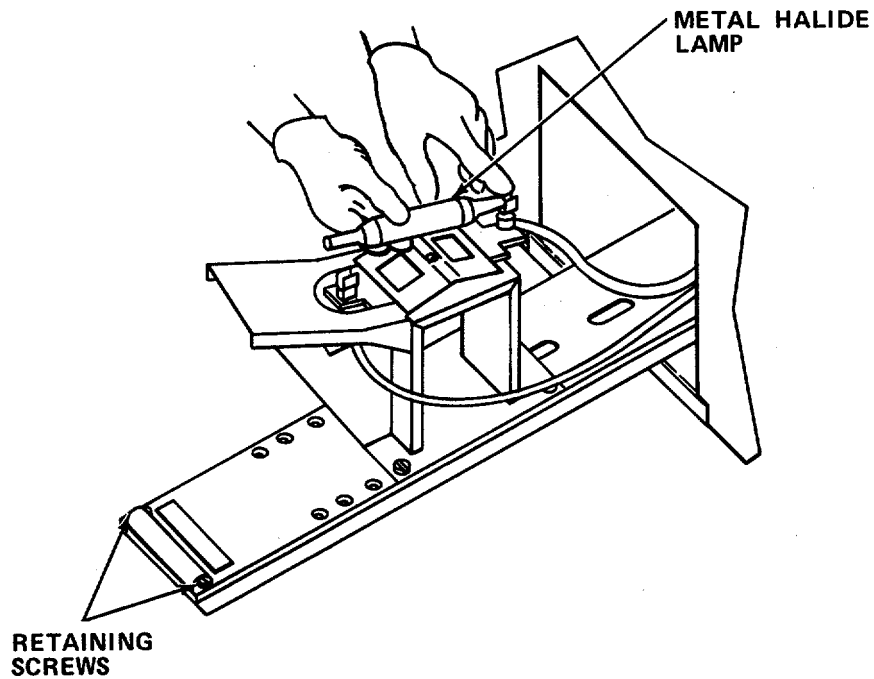
- (3) Using white gloves, carefully remove glass light shield and store in glass holder on wall.
- (4) Reinstall two hex head screws and clamps on each side of reflector.
- (5) Rotate glass frame into horizontal position and lock into place with frame release knob. -

HOLDDOWN BRACKETS



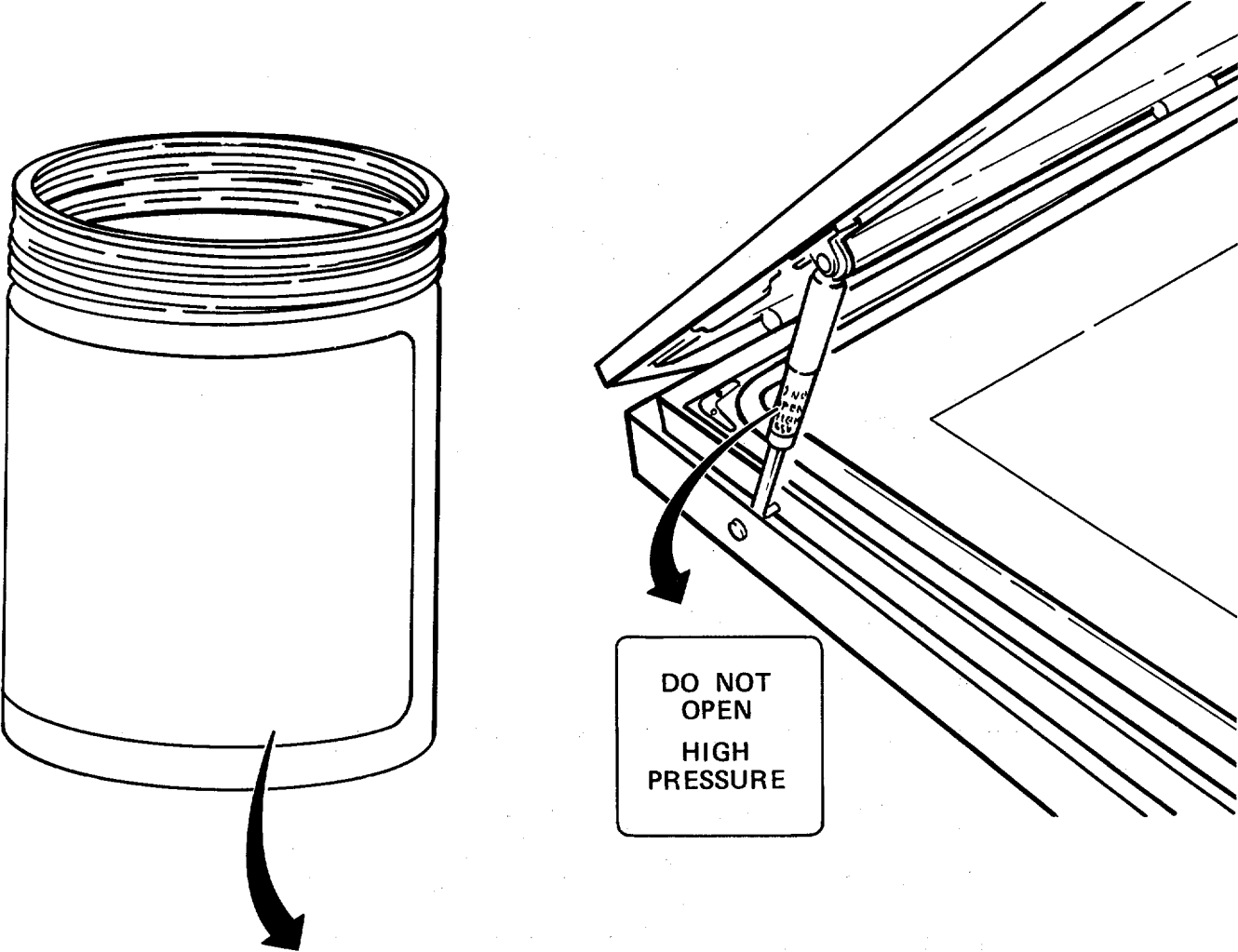
- c. Rotate two vacuum frame holddown brackets on corners to lock vacuum frame in place.
- d. Removal of metal halide exposure lamp.

- (1) Remove safety screw from lower cabinet door.
- (2) Turn door knob and open lower cabinet door.



- (3) Remove two retaining screws from each side of lamp drawer handle.
- (4) Pull drawer out as far as it will go.
- (5) Wearing white gloves, remove metal halide exposure lamp from fuse clips and store.
- (6) Slide lamp drawer all the way back into cabinet.
- (7) Reinstall two retaining screws to hold drawer in place.
- (8) Close lower cabinet door and turn door locking knob to lock door.
- (9) Reinstall safety screw on lower cabinet door.

2-6.5 Operating Instructions on Decals and Instruction Plates.



WHEN INSTALLED - AS INTAKE FILTER:

INCOMING AIR MUST ENTER JAR FIRST.

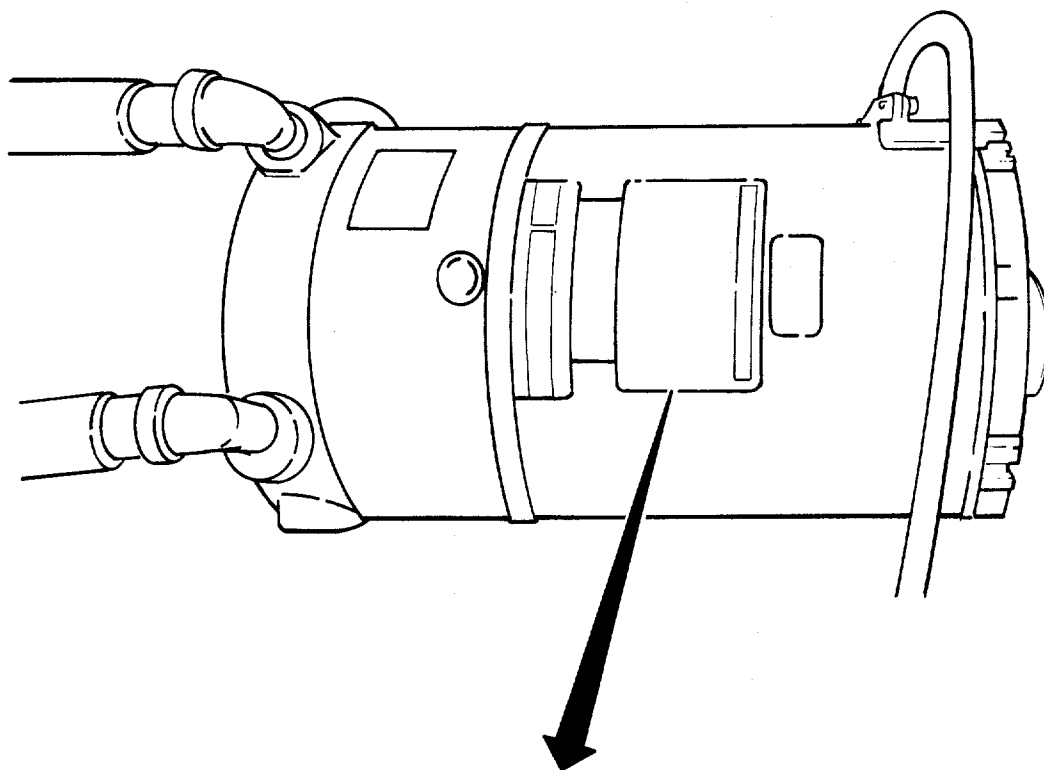
AS EXHAUST MUFFLER:

ON LUBRICATED PUMP: AIR MUST PASS THRU FILTERING ELEMENT FIRST BEFORE ENTERING JAR FOR BEST SILENCING AND SEPARATION OF OIL VAPOR. EMPTY OIL AND/OR MOISTURE BEFORE THE LIQUID LEVEL REACHES FELT.

ON OIL - LESS PUMP: AIR MUST ENTER JAR FIRST FOR BEST COLLECTION OF GRAPHITE DUST FROM CARBON VANES.

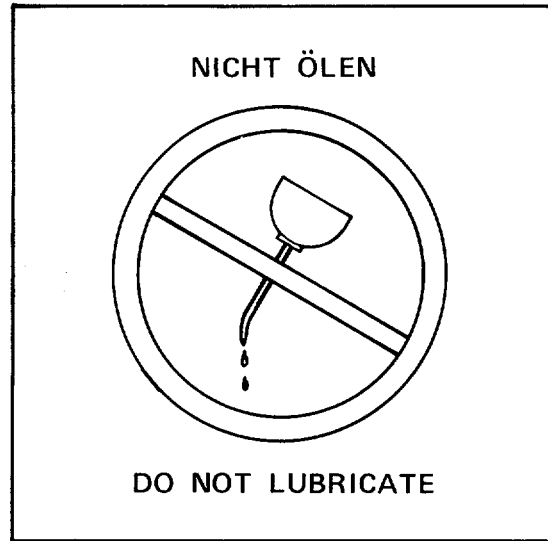
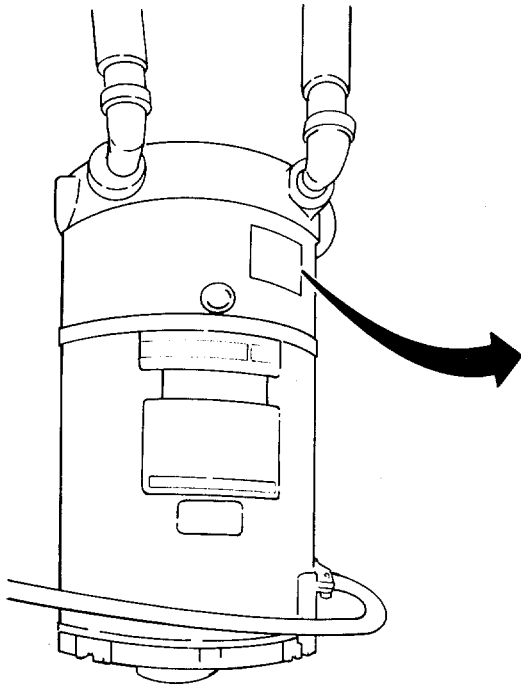
CAUTION: GLASS JAR COULD EXPLODE IF SUBJECTED TO MORE THAN 5 P.S.I.G./,35 bar (METAL JAR SAFE TO 30 P.S.I.G./2 bar)

IMPORTANT: CLEAN FELTS EVERY 100 HOURS. REPLACE FELTS TWICE A YEAR

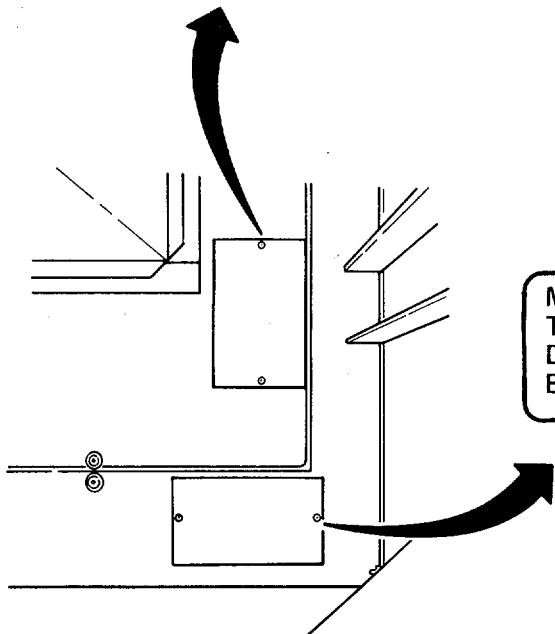


CAUTION

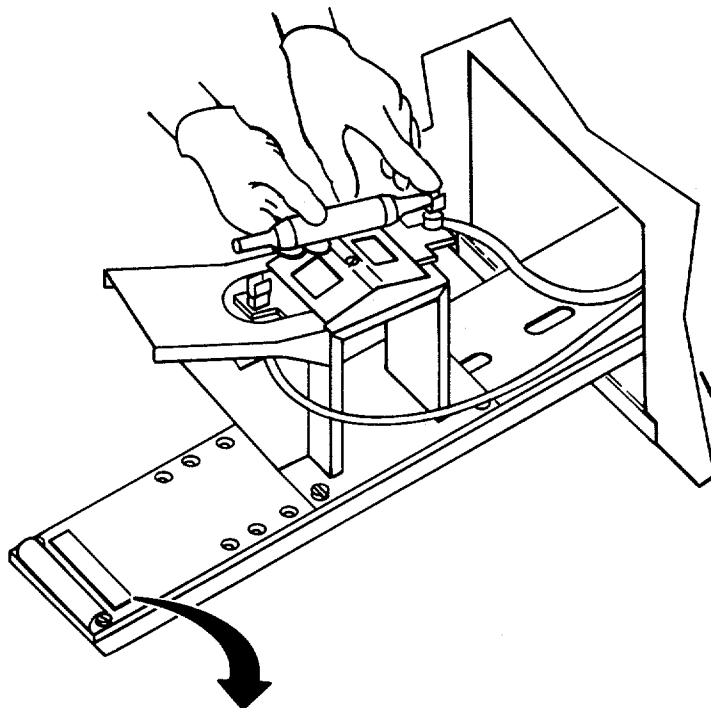
**NEVER LUBRICATE THIS OIL - LESS PUMP.
FLUSHING WHILE RUNNING PUMP,
SLOWLY FEED 1 TO 2 OZ. OF LOCTITE
SAFETY SOLVENT, DOW CHEMICAL SOLVENT
OR EQUIV. SOLVENTS WITH A TOXICITY
RATING OF 500PPM OR GREATER INTO
INLET. DO NOT INHALE FUMES, FLUSH
IN OPEN AREA AWAY FROM OPEN FLAME.
DO NOT USE A PETROLEUM BASE SOLVENT**



MAIN CONTACTOR CONTROLLING POWER TO THIS UNIT IS BELOW THIS PLATE. DISCONNECT UNIT FROM POWER SOURCE BEFORE SERVICING THIS CONTACTOR.



MAIN CONTACTOR CONTROLLING POWER TO THIS UNIT IS BELOW THIS PLATE. DISCONNECT UNIT FROM POWER SOURCE BEFORE SERVICING THIS CONTACTOR.



CAUTION: USE HT121 OR KM5 LAMP, 3000W

WARNING: EYE AND SKIN DAMAGE MAY RESULT FROM DIRECT VIEWING OF, OR EXPOSURE TO, THE LAMP IN THIS UNIT. ALWAYS TURN OFF LAMP BEFORE PERFORMING ANY MAINTENANCE.

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 the operation or maintenance of the flip-top platemaker, 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. FLIP-TOP PLATEMAKER DOES NOT ENERGIZE.

Step 1. Check that lower cabinet door is closed tightly.

- (a) If door tightly closed, proceed to step 2.
- (b) Close lower cabinet door tightly.

Step 2. Check that master circuit breaker in platemaker not tripped.

- (a) If circuit breaker not tripped, proceed to step 3.
- (b) Reset circuit breaker.

Step 3. Check position of power panel circuit breaker.

- (a) Reset circuit breaker.
- (b) If circuit breaker is on, refer to organizational maintenance.

Table 2-2. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. EXPOSURE LAMP DOES NOT OPERATE IN MANUAL OR AUTOMATIC OPERATIONS.	Step 1. Check that glass frame is properly locked in its horizontal position.	<ul style="list-style-type: none"> (a) If glass frame properly locked in place, proceed to step 2. (b) Properly lock glass frame in place.
	Step 2. Check for defective exposure lamp.	<ul style="list-style-type: none"> (a) Replace exposure lamp (paragraph 2-10.1). (b) If problem remains, refer to organizational maintenance.
3. HALATION OCCURS: APPEARS AS DOT SPREADING; COPY ENLARGED AT EDGES; SHADOWS ON TYPE.	Step 1. Check for overexposure which may accent poorly stripped areas.	<ul style="list-style-type: none"> (a) If exposure correct proceed to step 2. (b) Adjust for proper exposure.
	Step 2. Check for yellowed or defective sensitivity guide.	<ul style="list-style-type: none"> (a) If guide is not defective, proceed to step 3. (b) Replace sensitivity guide.
	Step 3. Check flat for proper stripping.	<ul style="list-style-type: none"> (a) If flat properly prepared, proceed to step 4. (b) Have flat properly stripped.
	Step 4. Check vacuum level used.	<ul style="list-style-type: none"> (a) If vacuum correct, proceed to step 5. (b) Repeat procedure using proper vacuum.

Table 2-2. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
3. HALATION OCCURS: APPEARS AS DOT SPREADING; COPY ENLARGED AT EDGES; SHADOWS ON TYPE Cont	Step 5. Check that the proper units of lights were entered.	<ul style="list-style-type: none"> (a) If light units were entered correctly, proceed to step 6. (b) Enter correct units of light. Step 6. Adjust photodetector assembly (paragraph 2-10.2). If problem persists, notify your supervisor.
4. BROKEN IMAGES.	Step 1. Check stripped flat for tape or opaquing solution covering portion of image that is broken. (a) If stripped flat is correctly prepared, proceed to step 2.	<ul style="list-style-type: none"> (b) Correctly prepare flat. Step 2. Check that glass frame is clean. (a) If glass frame is clean, proceed to step 3. (b) Clean glass frame. Step 3. Check exposure with sensitivity guide. (a) If exposure correct, problem may be due to flat being dirty. Clean flat. (b) Reset exposure controls.

2-10. MAINTENANCE PROCEDURES.

- a. This section contains instructions covering operator maintenance functions for the flip-top platemaker. 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

PROCEDURE	PARAGRAPH
Replace Exposure Lamp	2-10.1
Adjust Photodetector Assembly	2-10.2

2-10.1 Replace Exposure Lamp.

MOS: 83E, Photo and Layout Specialist

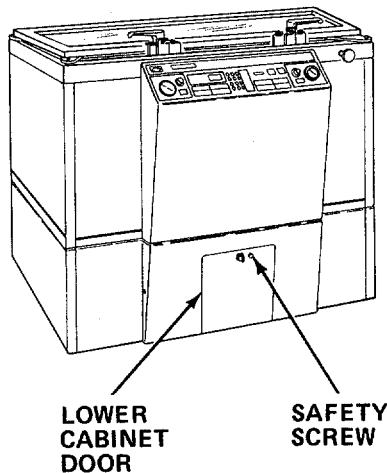
TOOLS: Flat Tip Screwdriver

SUPPLIES: Exposure Lamp

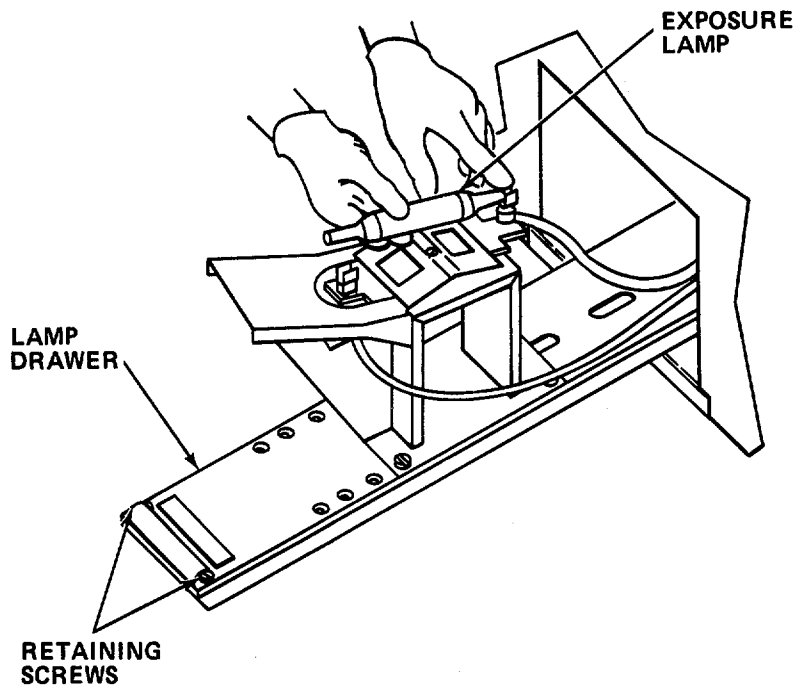
WARNING

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

- a. Turn off power panel circuit breaker.



- b. Remove screw and open lower cabinet door.



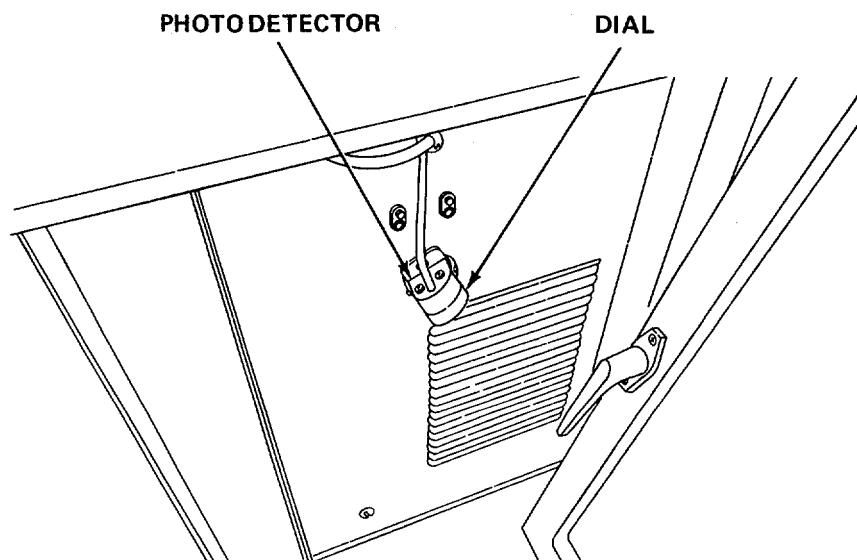
- c. Remove two screws holding lamp drawer.
- d. Pull drawer out as far as it will go.
- e. Remove defective exposure lamp from fuse clips.
- f. Using white gloves, install new exposure lamp into fuse clips.
- g. Slide lamp drawer back into cabinet.
- h. Install two retaining screws for lamp drawer.
- i. Close lower cabinet door and retain with safety screw.
- j. Turn on power panel circuit breaker.

2-10.2 Adjust Photodetector Assembly.

MOS: 83E, Photo and Layout Specialist

TOOLS: Flat Tip Screwdriver

- a. Pull out frame release knob and flip glass frame into vertical position.



- b. Loosen center screw and turn dial to next highest digit to increase time value of one unit of light. Turn dial to next lowest digit to decrease time value of one unit of light.
- c. Retighten screw and run test exposure.
- d. If necessary, repeat procedure until proper adjustment is obtained.

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 5-3610-285-24P 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 CHECK S 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 column. 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:

<u>Item</u>	<u>Quantity</u>
Flat Tip Screwdriver	1
1/2 in. Drive Socket Set	1
Hex Head Key Wrench Set	1
Nonflammable Flushing Solvent (Item 54, Appendix E)	ar
Vacuum Pump Filters	4

Table 2-3. 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
1	M	<p><u>FLIP-TOP PLATEMAKER</u></p> <p><u>Inspect and Service Vacuum Pump Filters.</u></p> <p style="text-align: center;">WARNING Death or serious injury may occur from electrical shock unless power is turned off before servicing.</p> <p>1. Turn off power panel circuit breaker.</p> <div style="text-align: center;"> </div> <p>2. Remove two screws and lower cabinet panel.</p> <div style="text-align: center;"> </div> <p>3. Remove intake and exhaust glass jars from both pumps.</p>

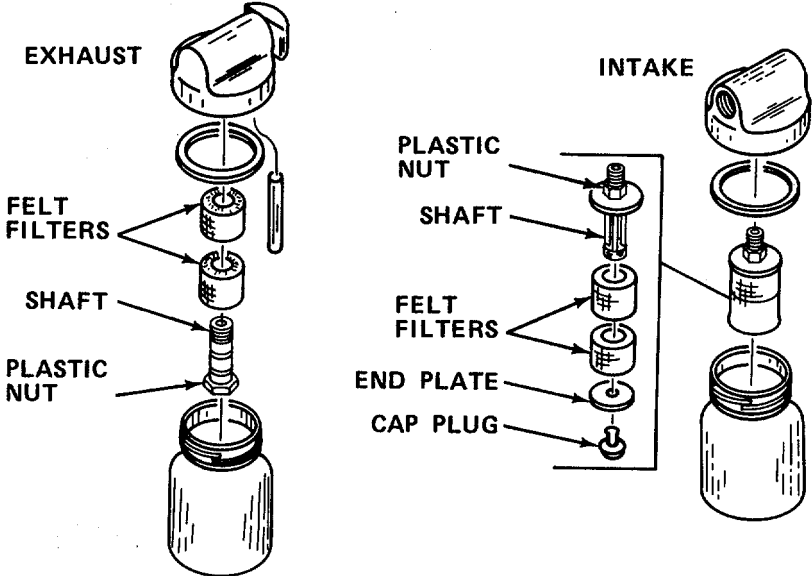
Table 2-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

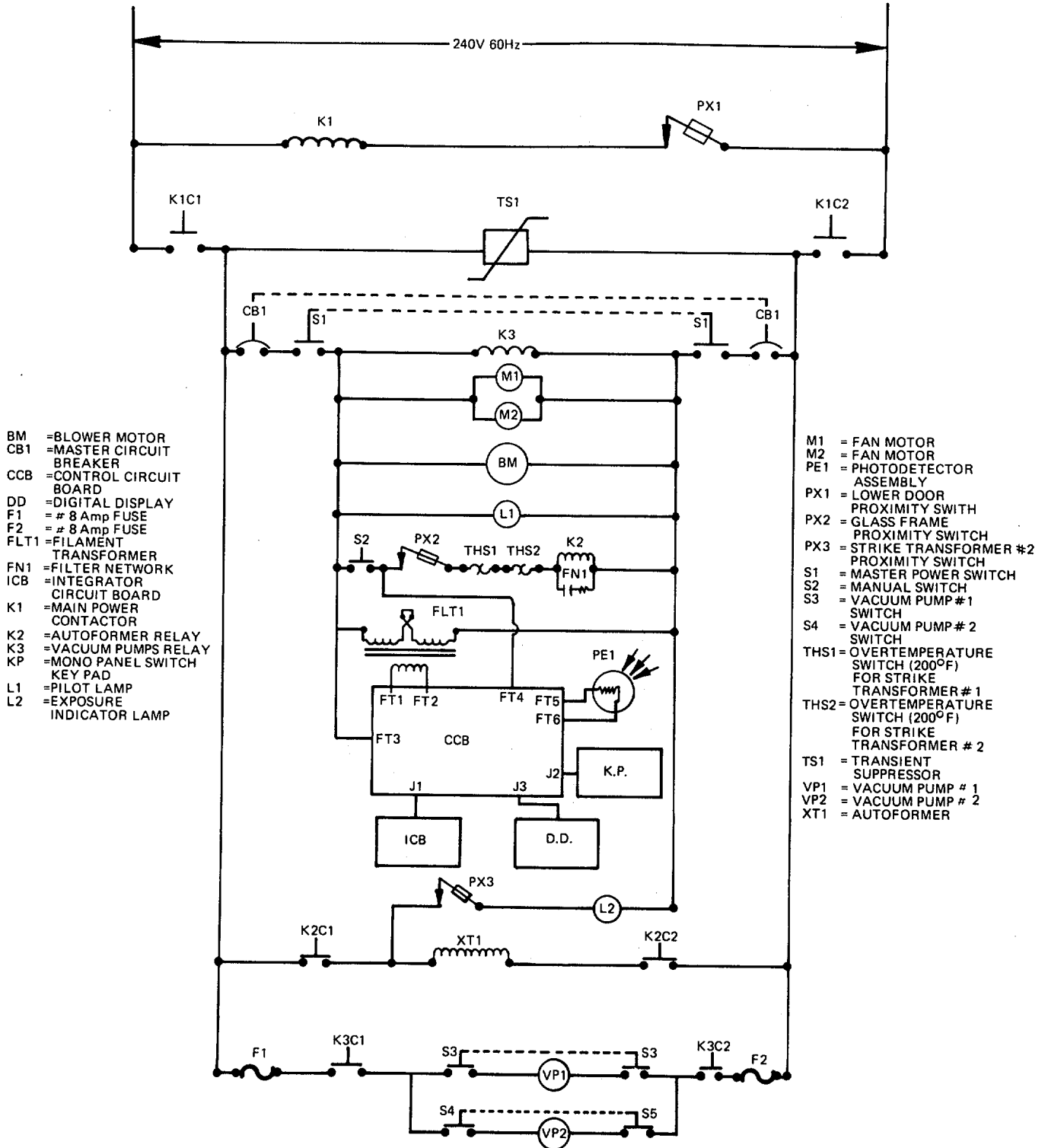
AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
1	M	<p><u>FLIP-TOP PLATEMAKER - Cont</u></p> <p><u>Inspect and Service Vacuum Pump Filters - Cont</u></p>  <p>4. Carefully remove intake filter assembly from both pumps.</p> <p>5. Remove cap plug and end plate on bottom of filter assemblies and remove two felt filters from each assembly.</p> <p>6. Remove plastic nut; then carefully remove exhaust filter assemblies and two felt filters from each assembly.</p> <p>7. Clean felt filters using nonflammable flushing solvent. Replace if necessary.</p> <p>8. Reinstall exhaust felt filters onto shafts and install shafts back onto vacuum pumps. Use care not to overtighten plastic nuts.</p> <p>9. Reinstall intake felt filters onto shafts; then install end plates and cap plugs.</p> <p>10. Reinstall intake and exhaust glass jars on both vacuum pumps.</p> <p>11. Reinstall lower cabinet panel.</p>

2-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES.

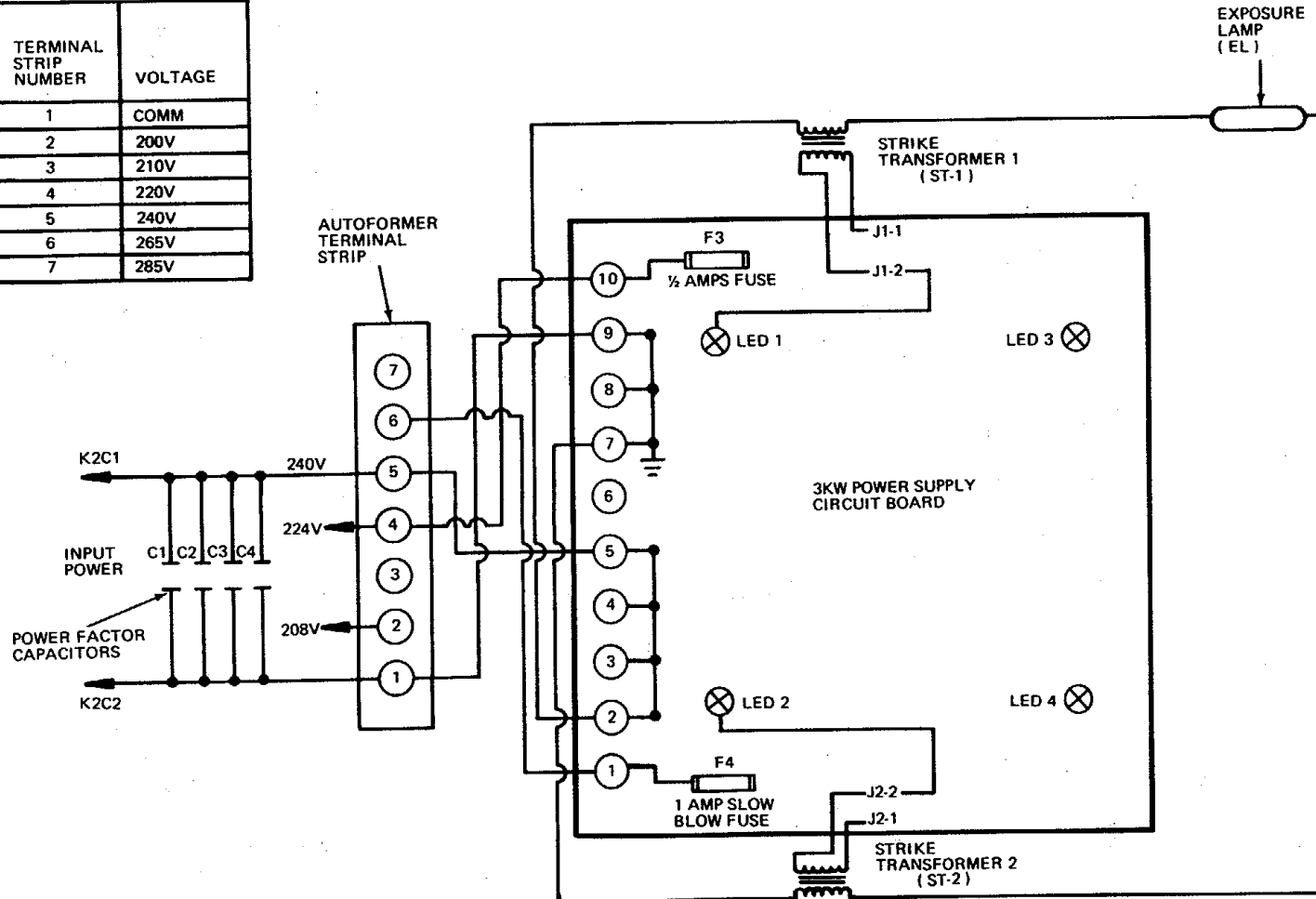
- a. Organizational troubleshooting procedures cover the most common malfunctions that may be repaired at the organizational level. Repair or adjustment requiring specialized equipment is not authorized unless such equipment is available. Troubleshooting procedures used by the operator should be conducted 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 is not corrected by a listed corrective action, notify your supervisor.
- c. For unidentified malfunctions, use the following schematics for further fault analysis.



- BM =BLOWER MOTOR
- CB1 =MASTER CIRCUIT BREAKER
- CCB =CONTROL CIRCUIT BOARD
- DD =DIGITAL DISPLAY
- F1 = # 8 Amp FUSE
- F2 = # 8 Amp FUSE
- FLT1 =FILAMENT TRANSFORMER
- FN1 =FILTER NETWORK
- ICB =INTEGRATOR CIRCUIT BOARD
- K1 =MAIN POWER CONTACTOR
- K2 =AUTOFORMER RELAY
- K3 =VACUUM PUMPS RELAY
- KP =MONO PANEL SWITCH
- L1 =PILOT LAMP
- L2 =EXPOSURE INDICATOR LAMP

- M1 = FAN MOTOR
- M2 = FAN MOTOR
- PE1 = PHOTODETECTOR ASSEMBLY
- PX1 = LOWER DOOR PROXIMITY SWITCH
- PX2 = GLASS FRAME PROXIMITY SWITCH
- PX3 = STRIKE TRANSFORMER #2 PROXIMITY SWITCH
- S1 = MASTER POWER SWITCH
- S2 = MANUAL SWITCH
- S3 = VACUUM PUMP #1 SWITCH
- S4 = VACUUM PUMP # 2 SWITCH
- THS1 = OVERTEMPERATURE SWITCH (200°F) FOR STRIKE TRANSFORMER # 1
- THS2 = OVERTEMPERATURE SWITCH (200°F) FOR STRIKE TRANSFORMER # 2
- TS1 = TRANSIENT SUPPRESSOR
- VP1 = VACUUM PUMP # 1
- VP2 = VACUUM PUMP # 2
- XT1 = AUTOFORMER

TERMINAL STRIP NUMBER	VOLTAGE
1	COMM
2	200V
3	210V
4	220V
5	240V
6	265V
7	285V



- LED 1 : LIT WHEN STRIKE PULSES ARE GENERATED FOR ST.1.
- LED 2 : LIT WHEN STRIKE PULSES ARE GENERATED FOR ST.2.
- LED 3 : OFF IF INPUT VOLTAGE IS TOO HIGH
- LED 4 : OFF IF INPUT VOLTAGE IS TOO LOW.

Table 2-4. ORGANIZATIONAL TROUBLESHOOTING

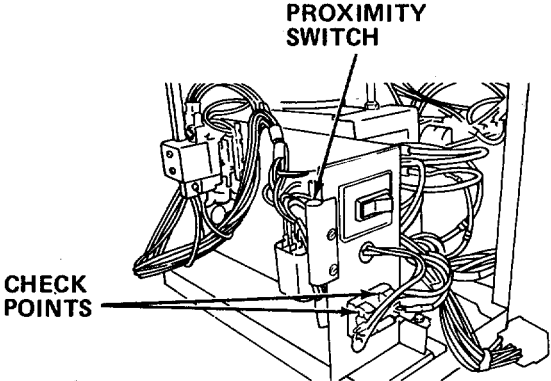
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. FLIP-TOP PLATEMAKER DOES NOT ENERGIZE.	Step 1. Check for 220 V ac input to flip-top platemaker at utility outlet box.	<ul style="list-style-type: none"> (a) If voltage is present, proceed to step 2. (b) If no voltage is present, proceed to organizational troubleshooting in chapter 1.
	Step 2. Check for 220 V ac between fuses F1 and F2 on relay panel.	<p style="text-align: center;">NOTE</p> <p>It will be necessary to override lower cabinet door proximity switch before voltage readings can be obtained. Remove magnet from door, and place it on switch.</p>
		<ul style="list-style-type: none"> (a) If voltage is present, proceed to step 3. (b) If voltage is not present,, proceed to step 4. <p>Step 3. Check output of master circuit breaker in platemaker.</p> <ul style="list-style-type: none"> (a) If voltage is present, replace master power switch (paragraph 2-16.12). (b) If voltage is not present, replace master circuit breaker (paragraph 2-16.16).

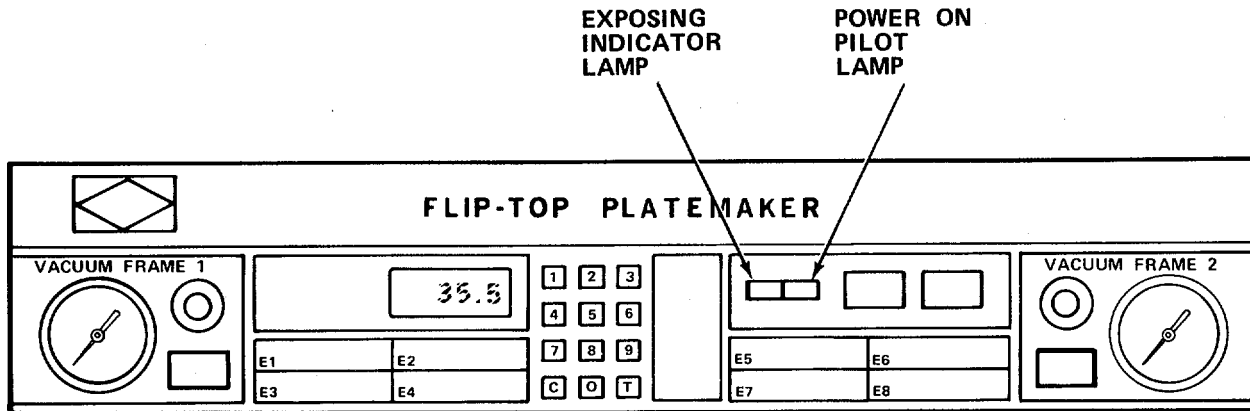
Table 2-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. FLIP-TOP PLATEMAKER DOES NOT ENERGIZE Cont	Step 4. Check operation of lower door proximity switch as follows:	<ul style="list-style-type: none"> (a) Turn off power panel circuit breaker. (b) Tag and disconnect proximity switch wires from quick disconnects. (c) Connect multimeter to proximity switch wires. (d) Activate proximity switch with magnet and check continuity with multimeter. <ul style="list-style-type: none"> (1) If meter reading is zero ohms resistance, replace main power contactor (K1) (paragraph 2-16.4). (2) If no continuity is present, replace proximity switch (PX1) (paragraph 2-16.18).
NOTE		
Replace magnet on door with two socket head screws.		
2. BLOWER MOTOR DOES NOT OPERATE.	Check that blower motor power cord is plugged in.	<ul style="list-style-type: none"> (a) If plugged in, replace blower motor (paragraph 2-16.2). (b) Plug in power cord.
3. POWER SUPPLY COOLING FAN(S) DO NOT OPERATE.	Replace fan motor assembly (paragraph 2-16.6).	

Table 2-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

3. POWER SUPPLY COOLING FAN(S) DO NOT OPERATE - Cont



4. POWER ON PILOT LAMP DOES NOT OPERATE.
 Replace POWER ON pilot/exposing indicator lamp (paragraph 2-16.13).
5. NEITHER VACUUM PUMP OPERATES.
 Check for defective fuse F1 or F2.
- (a) If fuses are good, replace vacuum pumps relay (K3) (paragraph 2-16.17).
 - (b) If fuse is defective, replace fuse.
6. ONLY ONE VACUUM PUMP OPERATES. Remove control panel (paragraph 2-16.10), and check continuity of vacuum pump switch for inoperative pump.
- (a) If continuity present, replace vacuum pump (paragraph 2-16.5).
 - (b) If continuity not present, replace vacuum pump switch (paragraph 2-16.12).

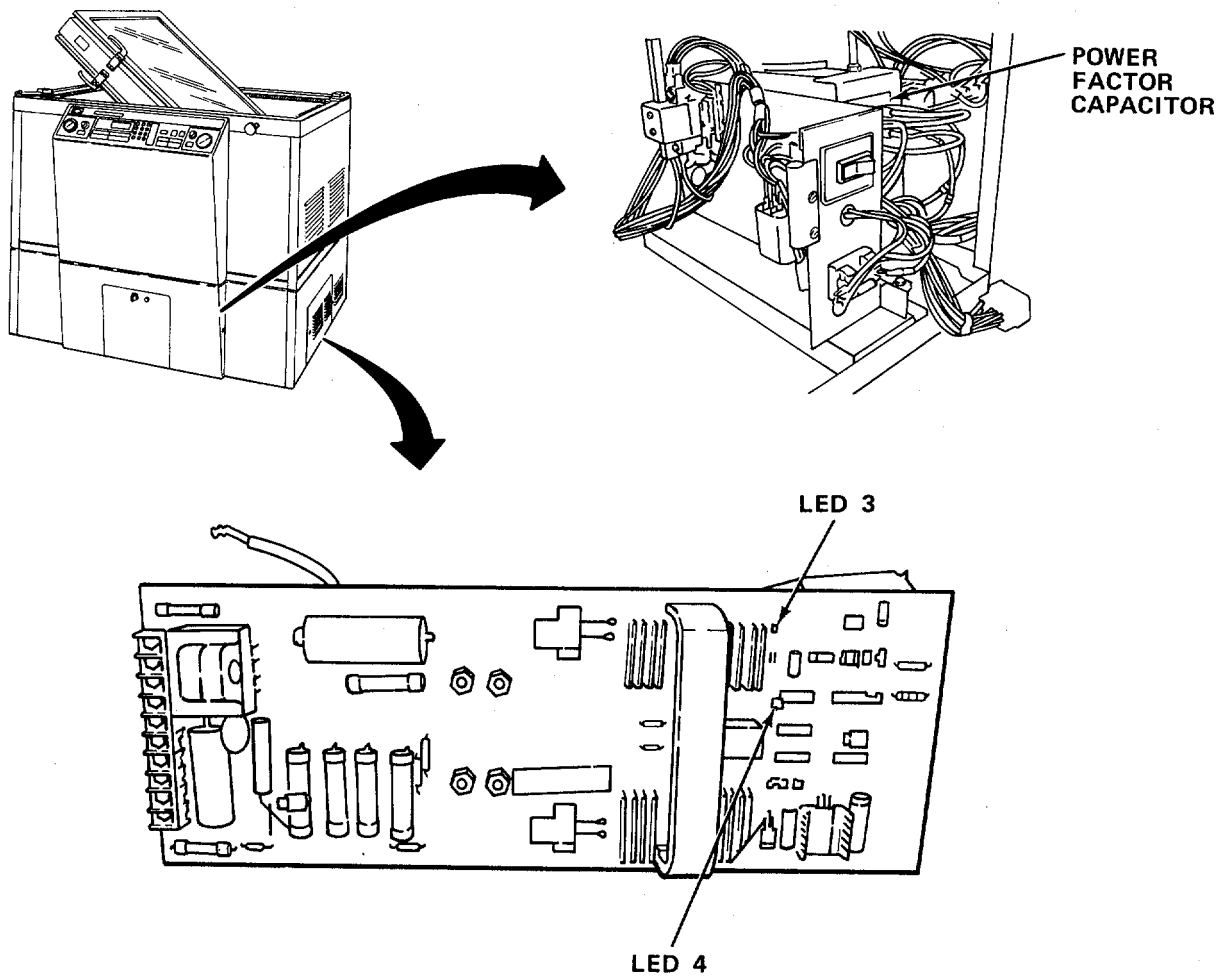
Table 2-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
7.	EXPOSURE LAMP OPERATES IN AUTOMATIC MODE BUT DOES NOT OPERATE IN MANUAL MODE.	Replace manual switch (S2) (paragraph 2-16.12).
8.	EXPOSURE LAMP OPERATES IN MANUAL MODE BUT NOT IN AUTOMATIC MODE.	Step 1. Check for 12 V ac output of filament transformer (FLT-1) as follows: <ul style="list-style-type: none"><li>(a) Turn off power panel circuit breaker.<li>(b) Remove two mounting screws for control panel from inside unit.<li>(c) Carefully lift control panel off lip and position so that access to control circuit board is obtained.<li>(d) Connect multimeter to connectors FT1 and FT2.<li>(e) Turn on power panel circuit breaker.<li>(f) Press master power switch and observe voltage reading on multimeter.<ul style="list-style-type: none"><li>(1) If 12 V ac is present, refer to direct/general support maintenance.<li>(2) If 12 V ac is missing, replace filament transformer (FLT-1) (paragraph 2-16.15).

Table 2-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

9. EXPOSURE LAMP DOES NOT OPERATE IN ANY MODE.



Step 1. Check LEDs 3 and 4 on 3kW power supply board as follows:

- (a) Turn off power panel circuit breaker.
- (b) Remove two screws and right side louvered panel.
- (c) Position panel so that fans can operate when power is applied.
- (d) Turn on power panel circuit breaker.

Table 2-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

- (e) Press master power switch on.
- (f) Press manual exposure switch on, and observe LEDs 3 and 4 on 3kW power supply board.
 - (1) If either or both LEDs are lit, refer to direct/general support maintenance.
 - (2) If both LEDs are off, proceed to step 2.

WARNING

You must stand on rubber matting before performing this procedure. Death or serious injury may occur.

Step 2. Check for 220 V ac across power factor capacitors as follows:

- (a) Turn off power panel circuit breaker.
- (b) Remove two screws and lower cabinet panel.
- (c) Place magnet on lower cabinet door to activate proximity switch.
- (d) Connect multimeter leads across two wires on any one capacitor.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure.

- (e) Turn on power panel circuit breaker.
- (f) Press master power switch on.
- (g) Press manual exposure switch on and observe voltage reading on multimeter.

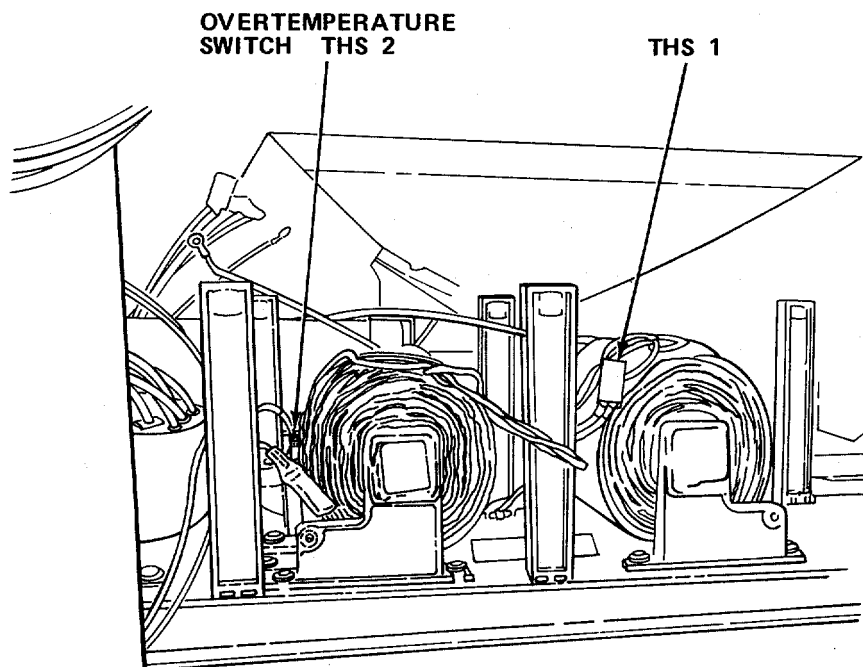
Table 2-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
9.	EXPOSURE LAMP DOES NOT OPERATE IN ANY MODE - Cont	
		(1) If voltage correct, proceed to step 3. (2) If voltage missing, proceed to step 4.
	Step 3. Check fuses F3 and F4 on 3kW power supply circuit board.	
		(a) If fuses are good, replace autoformer (paragraph 2-16.20). (b) Replace defective fuse(s).
	Step 4. Check continuity of glass frame proximity switch (PX2) as follows:	
		(a) Remove two mounting screws for control panel. (b) Carefully lift control panel from lip to gain access to terminal board on chassis. (c) Disconnect one of two wires going to control panel from terminal board. (d) With glass frame locked in horizontal position, check continuity across two terminals. (e) Reconnect wire.
		(1) If continuity present, proceed to step 5. (2) If continuity not present, replace glass frame proximity switch (PX2) (paragraph 2-16.1).

Table 2-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

9. EXPOSURE LAMP DOES NOT OPERATE IN ANY MODE - Cont



Step 5. Check overtemperature switches (THS1 and THS2) as follows:

- (a) Connect one meter lead to one of two terminals on terminal block behind control panel..

Table 2-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

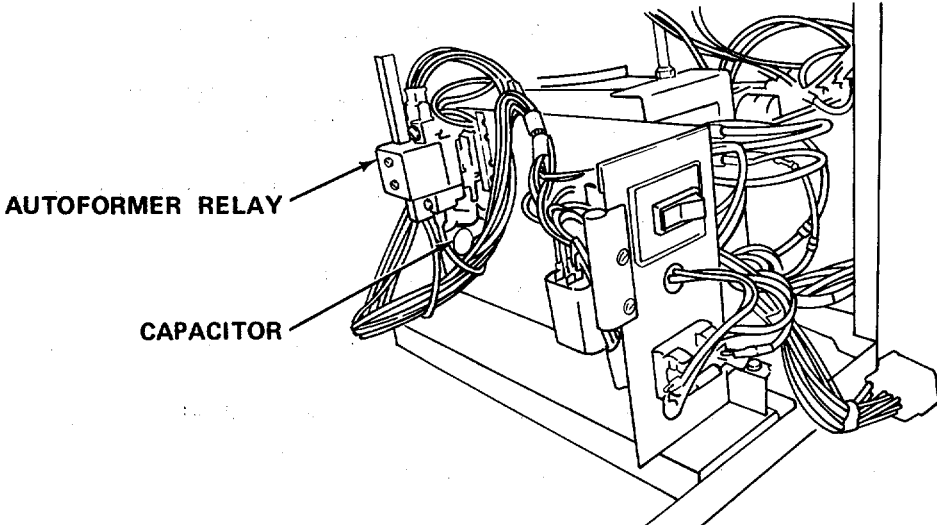
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
9. EXPOSURE LAMP DOES NOT OPERATE IN ANY MODE - Cont		<p>(b) Connect other meter lead to wire on rear of capacitor (wire number 5) on the autoformer relay (K2) and check for continuity.</p> <p>(1) If continuity is present, replace autoformer relay (K2) (paragraph 2-16.19).</p> <p>(2) If continuity is not present, refer to direct/general support maintenance for replacement of overtemperature switch.</p>
10. VACUUM PUMP DOES NOT BUILD UP CORRECT VACUUM.	Step 1. Check all vacuum hoses and connections for air leaks.	<p>(a) If no air leaks are found, proceed to step 2.</p> <p>(b) Correct cause of air leak.</p>

Table 2-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
10.	VACUUM PUMP DOES NOT BUILD UP CORRECT VACUUM - Cont	
	Step 2. Check for air leak around vacuum frame.	
	(a) If no leaks are found, proceed to step 3.	
	(b) If leaks are around vacuum frame, adjust left- and right-hand latches to lock glass frame more tightly.	
	(c) If latches cannot be adjusted enough, replace vacuum blanket assembly (paragraph 2-16.7).	
	Step 3. Check for defective vacuum bleed valve.	
	(a) If vacuum bleed valve is good, proceed to step 4.	
	(b) If defective, replace vacuum bleed valve (paragraph 2-16.14).	
	Step 4. Check for defective vacuum gage.	
	(a) If defective, replace vacuum gage (paragraph 2-16.11).	
	(b) If vacuum gage is good, flush vacuum pump (paragraph 2-16.21).	
	(c) If problem remains, replace vacuum pump (paragraph 2-16.5).	

2-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the flip-top platemaker. 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

PROCEDURES	PARAGRAPH
Replace Glass Frame Proximity Switch (PX2)	2-16.1
Replace Blower Motor	2-16.2

INDEX - Cont

PROCEDURES	PARAGRAPH
Replace Power Factor Capacitors	2-16.3
Replace Main Power Contactor (K1)	2-16.4
Replace Vacuum Pump(s)	2-16.5
Replace Fan Motor Assembly(s)	2-16.6
Replace Vacuum Blanket Assembly(s)	2-16.7
Replace Lift Arm(s)	2-16.8
Replace Glass Frame Glass	2-16.9
Remove/Install Control Panel	2-16.10
Replace Vacuum Gage	2-16.11
Replace Power Switch(es)	2-16.12
Replace POWER ON Pilot/Exposing Indicator Lamps	2-16.13
Replace Vacuum Bleed Valve	2-16.14
Replace Filament Transformer (FLT-1)	2-16.15
Replace Master Circuit Breaker (CB1)	2-16.16
Replace Vacuum Pumps Relay (K3)	2-16.17
Replace Lower Cabinet Door Proximity Switch (PXI)	2-16.18
Replace. Autoformer Relay (K2)	2-16.19
Replace Autoformer (XT1)	2-16.20
Flush Vacuum Pump(s)	2-16.21
Remove/Install Flip-Top Platemaker	2-16.22
Replace Photodetector Assembly	2-16.23

2-16.1 Replace Glass Frame Proximity Switch (PX2).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

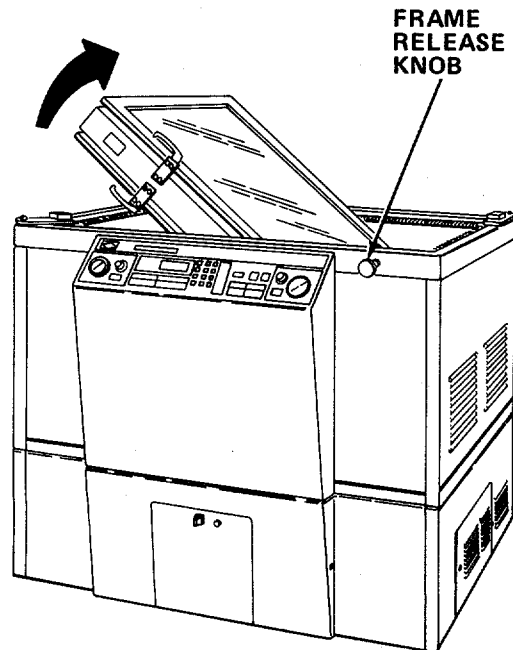
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Hex Head Key Wrench Set
Slip Joint Pliers

SUPPLIES: Proximity Switch

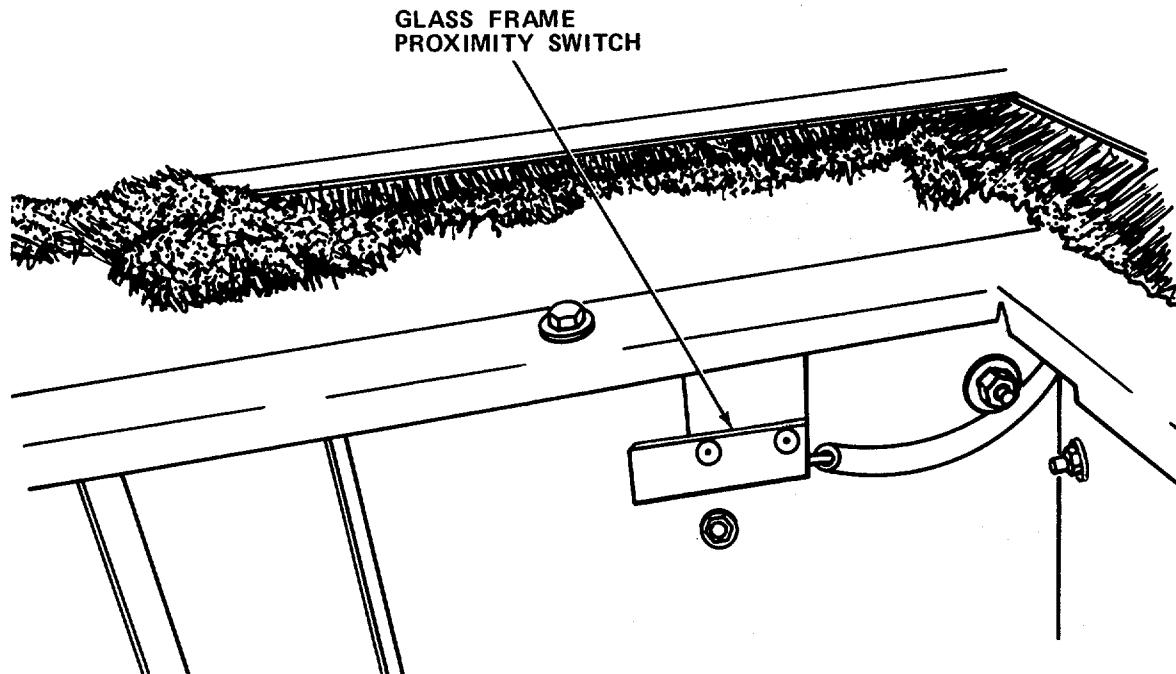
WARNING

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

- a. Turn off power panel circuit breaker.



- b. Pull out on frame release knob and flip glass frame into a vertical position.



- c. Remove mounting screws for control panel.
- d. Carefully lift the control panel from its mount.
- e. Tag and disconnect wires for proximity switch at the terminal block behind the control panel.
- f. Remove mounting screws and defective proximity switch. From the proximity switch, pull wiring through the platemaker frame.
- g. Install new proximity switch with wiring, and thread wiring through the frame, to the terminal block behind the control panel.
- h. Reconnect wires for proximity switch at the terminal block.
- i. Replace control panel on its mount, and secure with mounting screws.
- j. Rotate glass frame into horizontal position and lock into place with frame release knob.
- k. Turn on power panel circuit breaker.

2-16.2 Replace Blower Motor.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

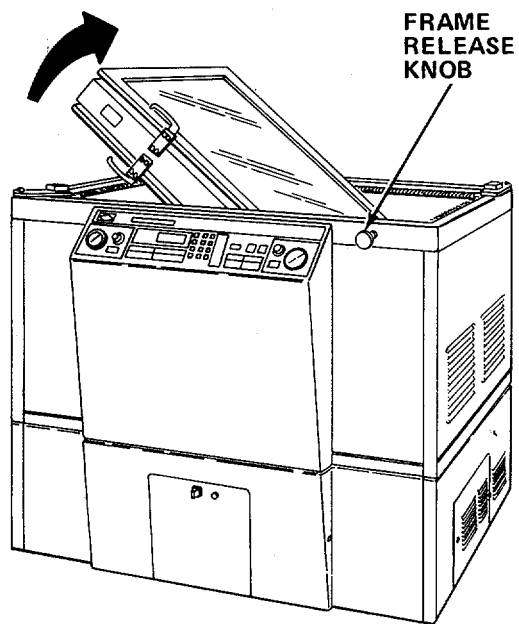
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Combination Wrench Set

SUPPLIES: Blower Motor

WARNING

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

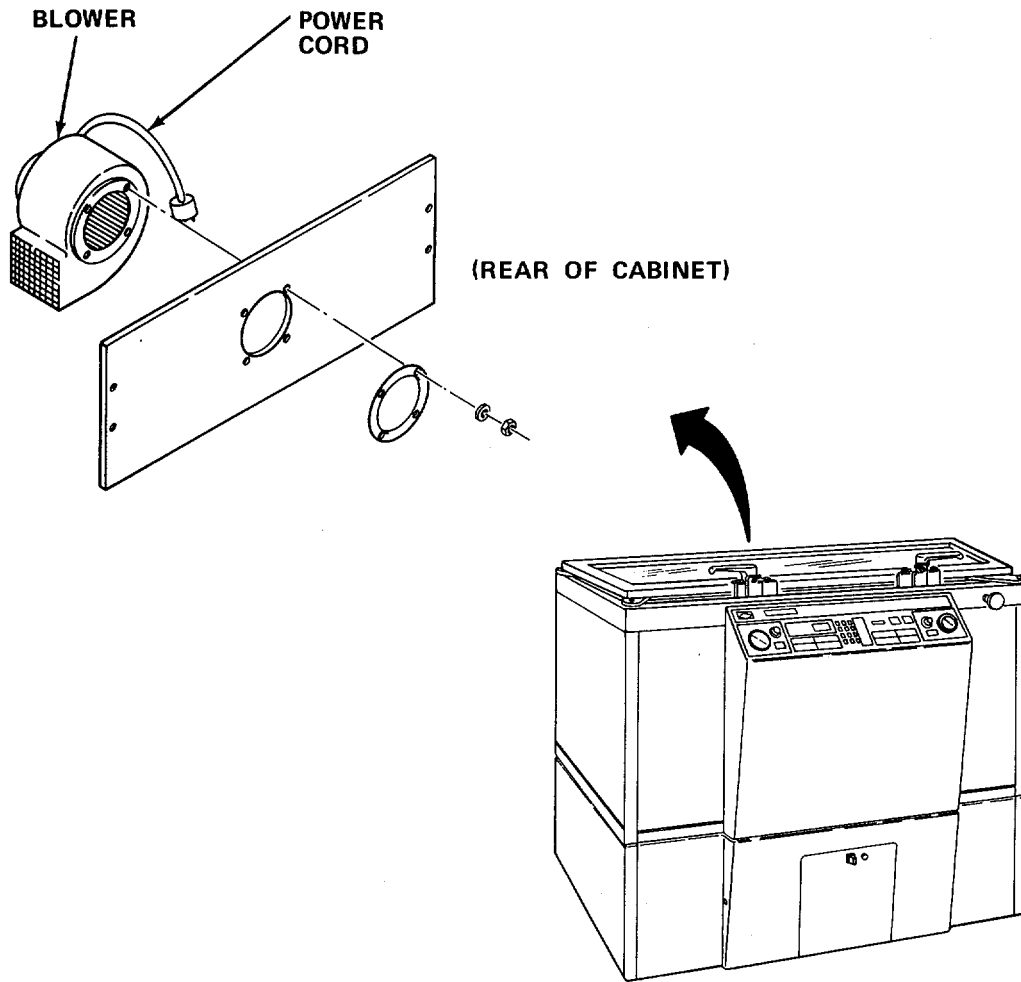
- a. Turn off power panel circuit breaker.



- b. Pull out frame release knob and flip glass frame into vertical position.

CAUTION

When working inside platemaker, ensure that no tools or heavy objects strike the glass light shield.



- c. Unplug power cord for blower motor.
- d. Remove four mounting nuts and defective blower motor.
- e. Install new blower motor onto frame and attach with four nuts.
- f. Plug in power cord for blower motor.
- g. Rotate glass frame into horizontal position and lock into place with frame release knob.
- h. Turn on power panel circuit breaker.

2-16.3 Replace Power Factor Capacitor(s).

MOS: 83FJ6, Reproduction Equipment Repairer

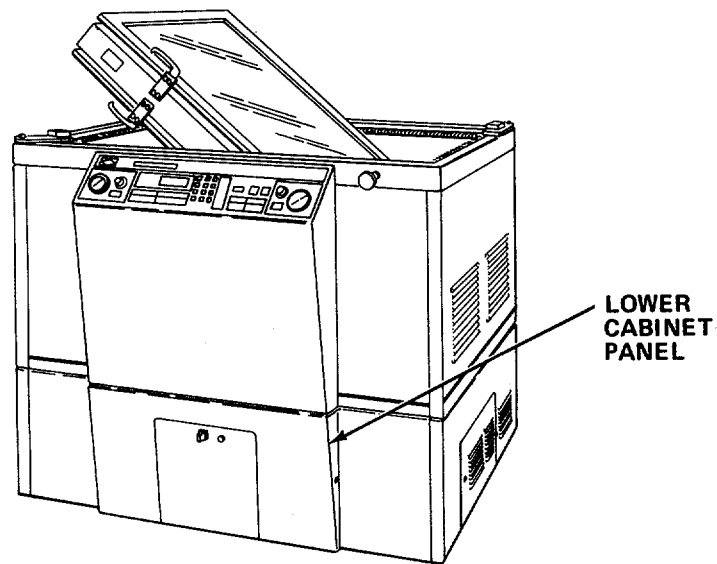
TOOLS:

Tool Kit, Light Machine Repair
Combination Wrench Set
Hex Head Key Wrench Set
Flat Tip Screwdriver

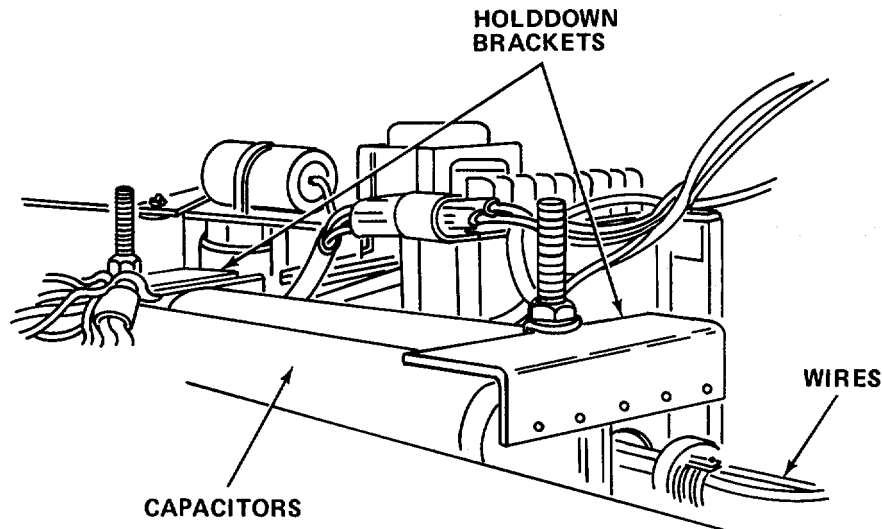
SUPPLIES: 47 μ F Capacitor 440V (ar)**WARNING**

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

- a. Turn off power panel circuit breaker.



- b. Remove two screws and lower cabinet panel.



WARNING

Voltages that are capable of causing death may be stored in capacitors after power is removed. Ground and discharge capacitors to zero volts before disconnecting capacitor leads. Personal injury or death may occur from failure to do so.

- c. Tag and disconnect wires from capacitors. Capacitor bottom connector is the negative connector.
- d. Remove nuts and washers from studs for holddown brackets that hold top two capacitors.

NOTE

If one of the top two capacitors is being replaced, proceed to step f.

- e. Remove nuts and washers from studs for holddown brackets that hold bottom two capacitors.
- f. Remove defective capacitor from housing.

NOTE

If one of the top two capacitors were replaced, proceed to step h.

- g. Install new capacitor into housing and reinstall holddown brackets for capacitors.
- h. Install new capacitors into housing and reinstall holddown brackets for top capacitors.
- i. Reconnect wires to capacitors.
- j. Reinstall lower cabinet panel.
- k. Turn on power panel circuit breaker.

2-16.4 Replace Main Power Contactor (K1).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

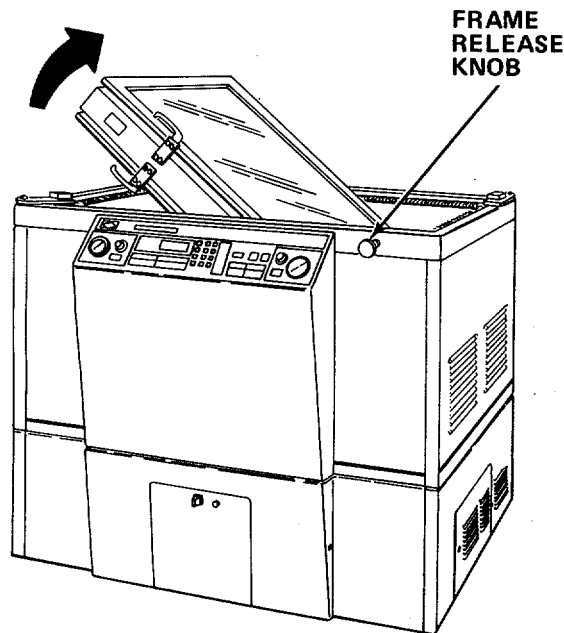
- Tool Kit, Light Machine Repair
- Flat Tip Screwdriver
- Hex Head Key Wrench Set
- Slip Joint Pliers

SUPPLIES: Contactor 25A 230 V ac, 50/60 Hz

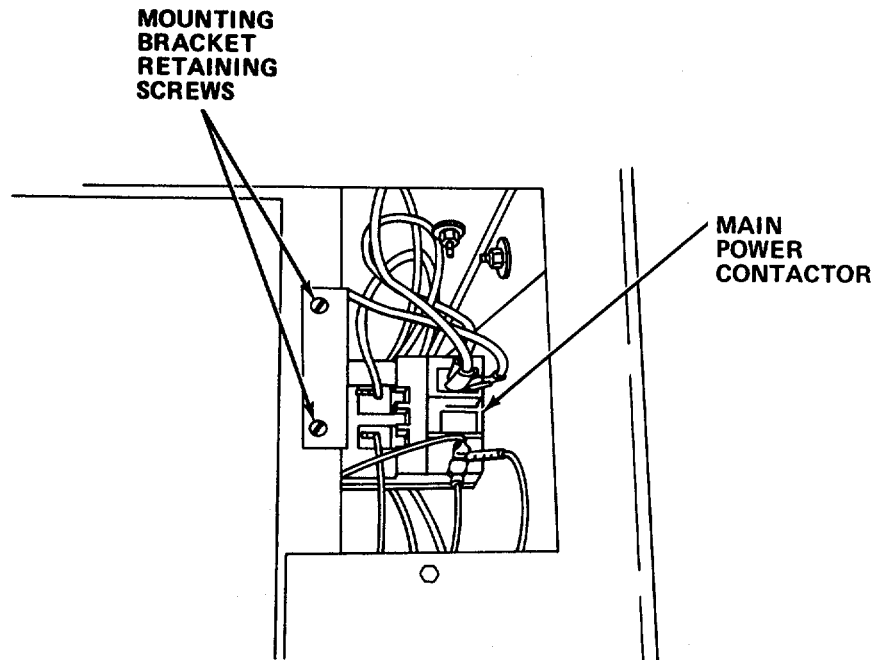
WARNING

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

- a. Turn off power panel circuit breaker.



- b. Pull out frame release knob and flip glass frame into vertical position.



- c. Remove main power contactor cover.
- d. Tag and disconnect wires from main power contactor.
- e. Remove two screws on bracket and remove bracket with contactor attached.
- f. Remove insulator and defective main power contactor from mounting bracket.
- g. Install new main power contactor and insulator onto mounting bracket.
- h. Reinstall contactor and mounting bracket into housing.
- i. Reconnect wire to new contactor.
- j. Reinstall main power contactor cover.
- k. Rotate glass frame into horizontal position and lock into place with frame release knob.
- l. Turn on power panel circuit breaker.

2-16.5 Replace Vacuum Pump(s).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

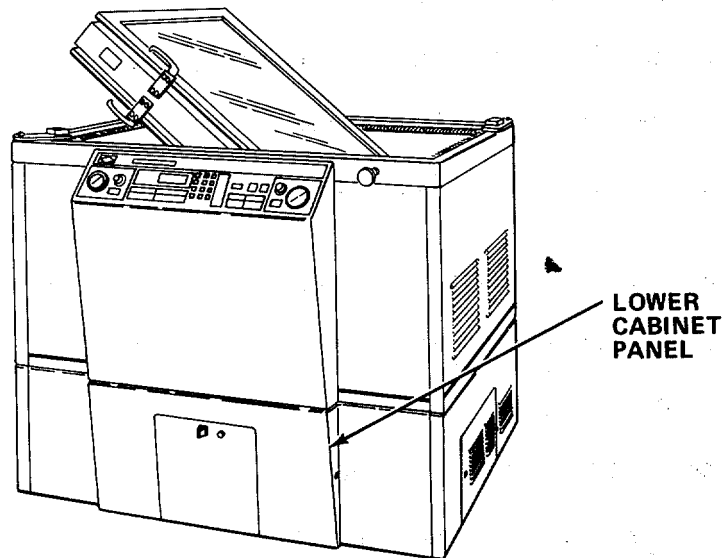
Tool Kit, Light Machine Repair
Combination Wrench Set
Hex Head Key Wrench Set
Flat Tip Screwdriver

SUPPLIES: Vacuum Pump(s)

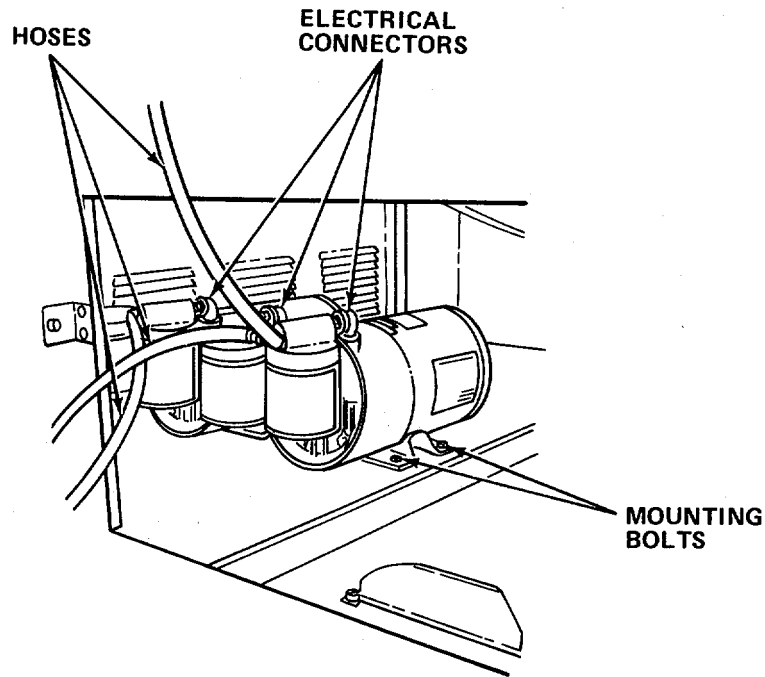
WARNING

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

- a. Turn off power panel circuit breaker.



- b. Remove two screws and lower cabinet panel.



- c. Tag and disconnect vacuum hoses from vacuum pumps.

NOTE

If the rear vacuum pump is to be replaced, the front pump must be removed first.

- d. Remove mounting bolts for vacuum pump(s) and remove defective vacuum pump from inside housing.
- e. Remove electrical cover plate.
- f. Tag and disconnect wires from defective vacuum pump.
- g. Reconnect wires to new vacuum pump.
- h. Reinstall cover plate over electrical connections.
- i. Insert new vacuum pump into flip-top platemaker housing.
- j. Reinstall mounting bolts for vacuum pump(s).
- k. Reconnect vacuum hoses to vacuum pump(s).
- l. Reinstall lower cabinet panel.
- m. Turn on power panel circuit breaker.

2-16.6 Replace Fan Motor Assembly(s).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

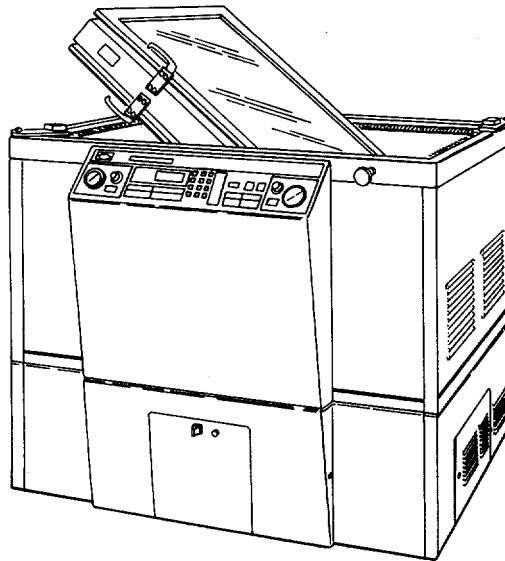
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Combination Wrench Set

SUPPLIES: Fan Motor Assembly(s)

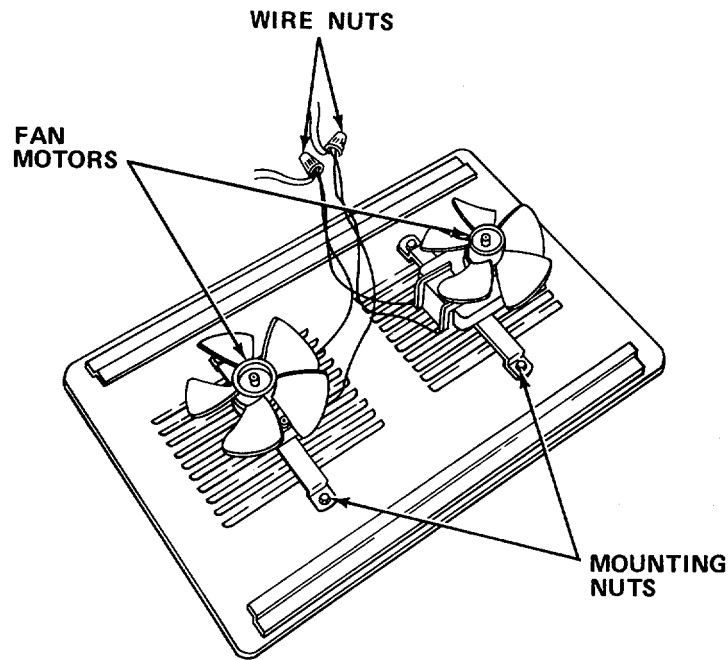
WARNING

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

- a. Turn off power panel circuit breaker.



- b. Remove two screws and right side louvered panel.
- c. Carefully remove wires from hook inside cabinet to gain access to wire nuts.



- d. Tag and disconnect wires to defective fan motor.
- e. Remove mounting nuts and defective fan motor and bracket.
- f. Remove fan motor from bracket.
- g. Attach new fan motor to bracket and install with mounting nuts.
- h. Reconnect wires to new fan motor.
- i. Suspend wires on hook inside cabinet to remove excess slack in wires.
- j. Reinstall right side louvered panel.
- k. Turn on power panel circuit breaker.

2-16.7 Replace Vacuum Blanket Assembly(s).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

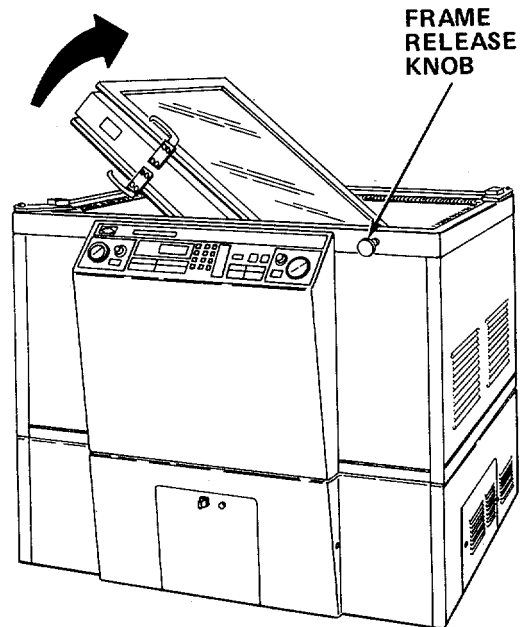
Tool Kit, Light Machine Repair

Flat Tip Screwdriver

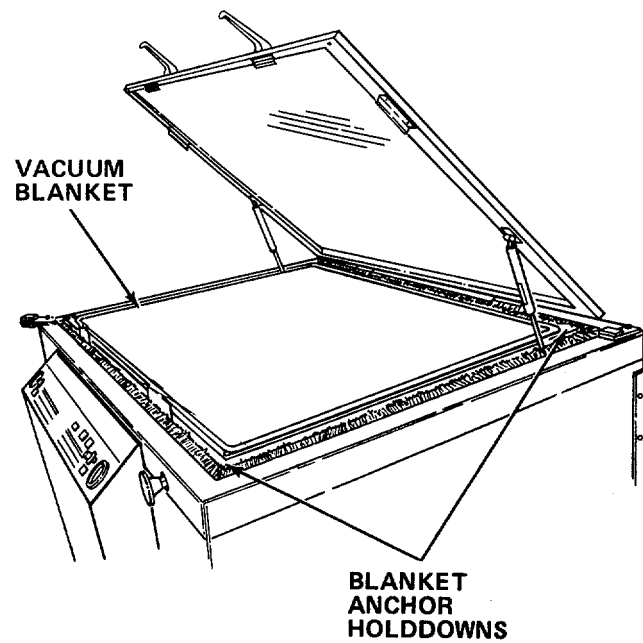
Nut Driver Set

Offset Flat Tip Screwdriver

SUPPLIES: Vacuum Blanket Assembly(s)



- a. Rotate glass frame so that defective blanket assembly is on the top, then lock into place with frame release knob.
- b. Unlock left- and right-hand latches and lift glass frame until the two lift arms take hold and open frame completely.



- c. Remove retaining screws and four blanket anchor holddowns.
- d. Carefully remove two vacuum hoses from vacuum blanket assembly.
- e. move defective vacuum blanket assembly from vacuum frame base.
- f. move defective vacuum blanket assembly.
- g. stall new vacuum blanket assembly on vacuum frame.
- h. Carefully reinstall two vacuum hoses to new vacuum blanket assembly.
- i. Reinstall four blanket anchor holddowns and retaining screws.
- j. Lower glass frame and lock left- and right-hand latches into place.

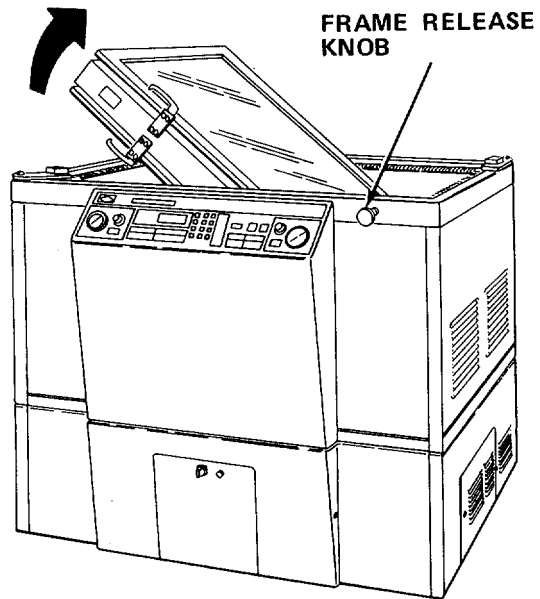
2-16.8 Replace Lift Arm(s).

MOS: 83FJ6, Reproduction Equipment Repairer

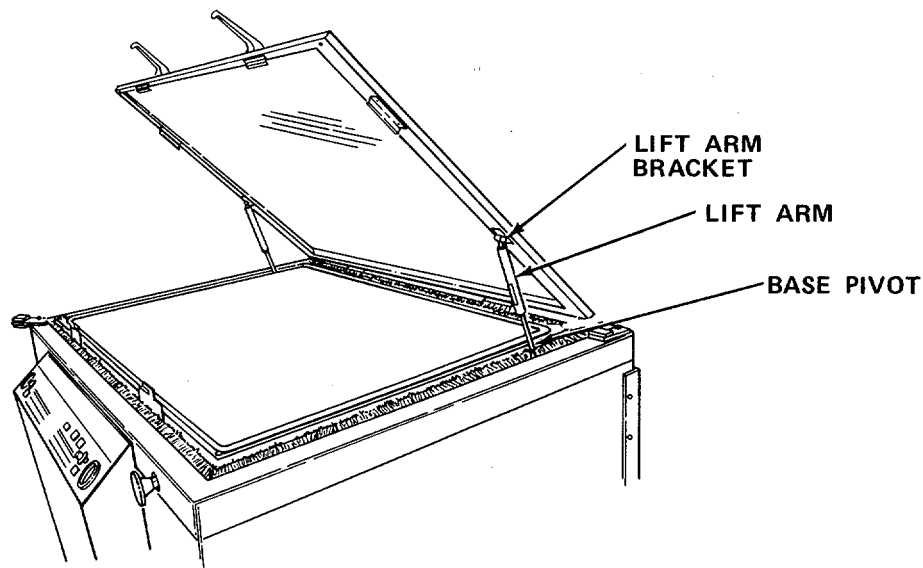
TOOLS:

Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Hex Head Key Wrench Set
Needle Nose Pliers

SUPPLIES: Lift Arm(s)



- a. Rotate glass frame so that defective lift arm(s) are on top; then lock into place with frame release knob.
- b. Unlock left and right-hand latches and lift glass frame until the lift arms take hold and open glass frame completely.
- c. Prop up glass frame to prevent it from falling when lift arm is removed.



- d. Carefully remove three E clips on pivot pin at base of lift arm.
- e. Using pliers, carefully remove pivot pin toward outside of platemaker.
- f. Remove lift arm bracket from glass frame.
- g. Remove E clip from lift arm bracket pin and remove pin and defective lift arm.
- h. Install new lift arm, and lift arm bracket pin into lift arm bracket and retain in place with E clip.
- i. Reinstall lift arm bracket on glass frame.

NOTE

Lift glass frame slightly to aid in aligning holes for pivot pin.

- j. Reinstall pivot pin through outside frame, through lift arm and into inside frame.
- k. Reinstall E clips on pivot pin.
- l. Remove item used to prop up glass frame.
- m. Lower glass frame and lock left- and right-hand latches into place.

2-16.9 Replace Glass Frame Glass.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS:

Tool Kit, Light Machine Repair
Hex Head Key Wrench Set

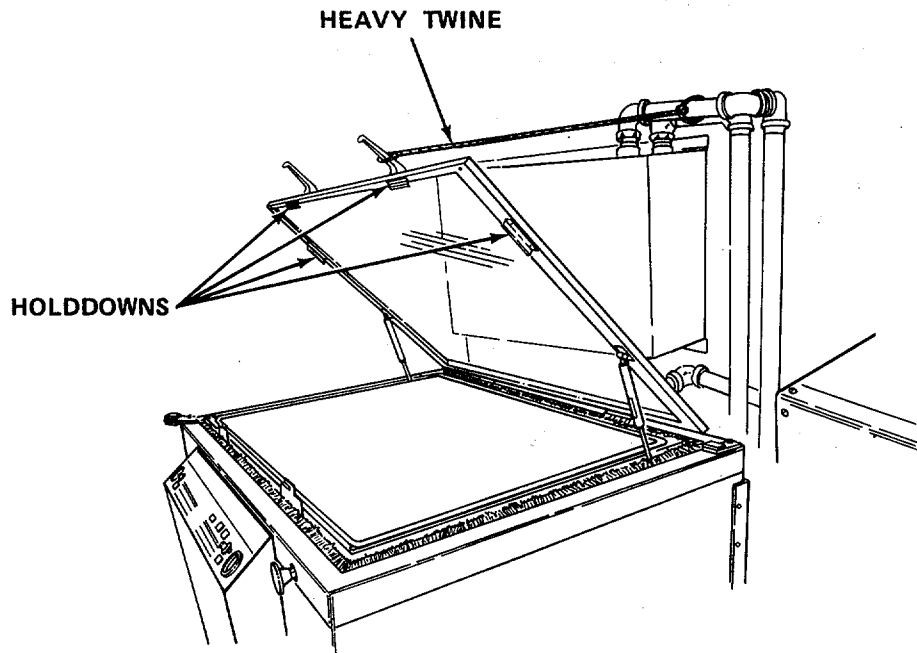
SUPPLIES: Glass
Rope or Heavy Twine, Approximately 3 Feet (Item 65, Appendix E)

WARNING

- Serious injury may occur if inadequate number of personnel are used to remove/install glass. This glass weighs 35 lbs.
 - To prevent serious injury, remove all pieces of broken glass possible, prior to raising glass frame to an upright position.
- a. Unlock left- and right-hand latches and lift glass frame until the lift arms take hold and open the glass frame completely.
 - b. Remove E clips from both lift arm bracket pins and remove pins.
 - c. Allow lift arms to lie horizontally inside platemaker frame.
 - d. Secure glass frame in an upright position by tying twine or rope from the left- and right-hand latches to pipes from water tank.

WARNING

Additional pieces of broken glass may fall from frame as holddowns are removed or loosened. Exercise extreme caution to prevent personal injury.



- e. Carefully remove eight glass holddowns and remove defective glass.
- f. Clean glass frame and vacuum blanket to remove any broken glass.
- g. Carefully install new glass in frame and secure in place with glass holddowns.
- h. Slack the twine or rope from the water pipes to slightly lower glass frame enough to reinstall lift arms.
- i. Aline lift arms into lift arm brackets. Secure with lift arm bracket pins and E clips.
- j. Remove rope or twine, and lower glass frame. Lock left and right-hand latches in place.

2-16.10 Remove/Install Control Panel.

MOS: 83FJ6, Reproduction Equipment Repairer

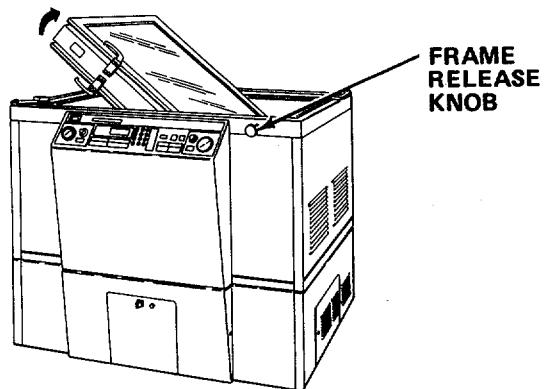
TOOLS:

Tool Kit, Light Machine Repair
 Hex Head Key Wrench Set
 Flat Tip Screwdriver

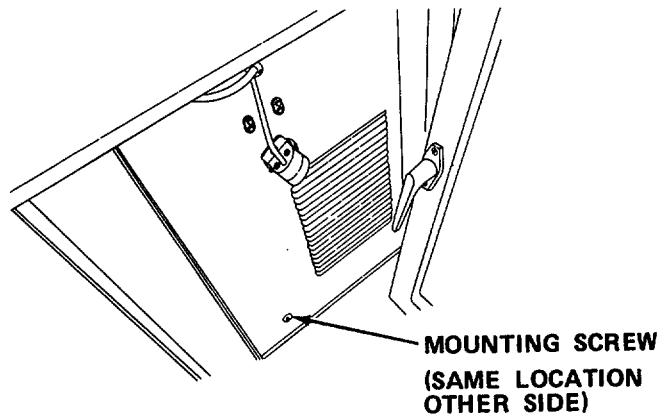
WARNING

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

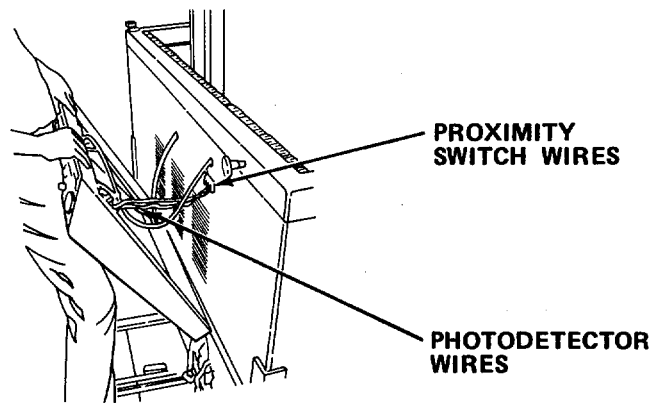
- a. Turn off power panel circuit breaker.



- b. Pull out frame release knob and flip glass frame into vertical position.



- c. Remove mounting screws for control panel.
 d. Carefully lift control panel from its mount to gain access to wiring.



- e. Tag and disconnect wires for photo detector assembly.
- f. Tag and disconnect wires for glass frame proximity switch from terminal block.
- g. Tag and disconnect vacuum hoses from vacuum gages.
- h. Carefully set control panel back onto top retaining lip.
- i. Remove two screws and lower cabinet panel.
- j. Tag and disconnect plug connector for control panel.
- k. Remove control panel from flip-top platemaker and place on a convenient work surface.
- l. Carefully reinstall control panel onto top retaining lip.
- m. Reconnect plug connector for control panel.
- n. Reinstall lower cabinet panel.
- o. Carefully lift control panel from retaining lip to gain access to wiring.
- p. Reconnect vacuum hoses to vacuum gages.
- q. Reconnect wires for glass frame proximity switch to terminal block.
- r. Reconnect wires-for photo detector assembly.
- s. Carefully lift control panel onto its mount.
- t. Reinstall mounting screws for control panel.
- u. Rotate glass frame into horizontal position and lock into place with frame release knob.
- v. Turn on power panel circuit breaker.

2-16.11 Replace Vacuum Gage.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

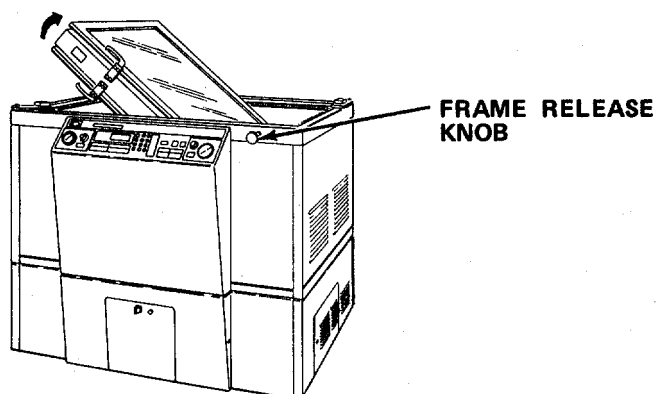
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Hex Head Key Wrench Set
 Combination Wrench Set

SUPPLIES: Vacuum Gage

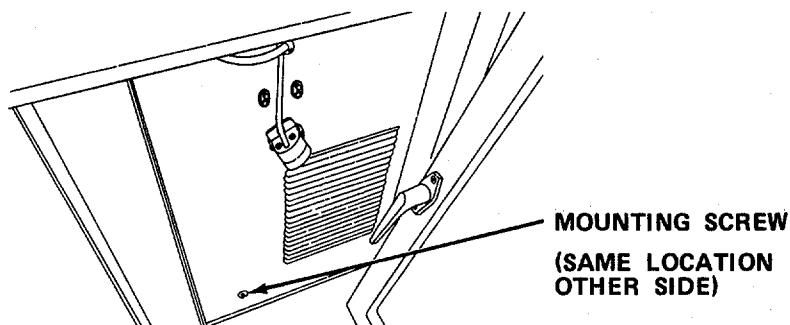
WARNING

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

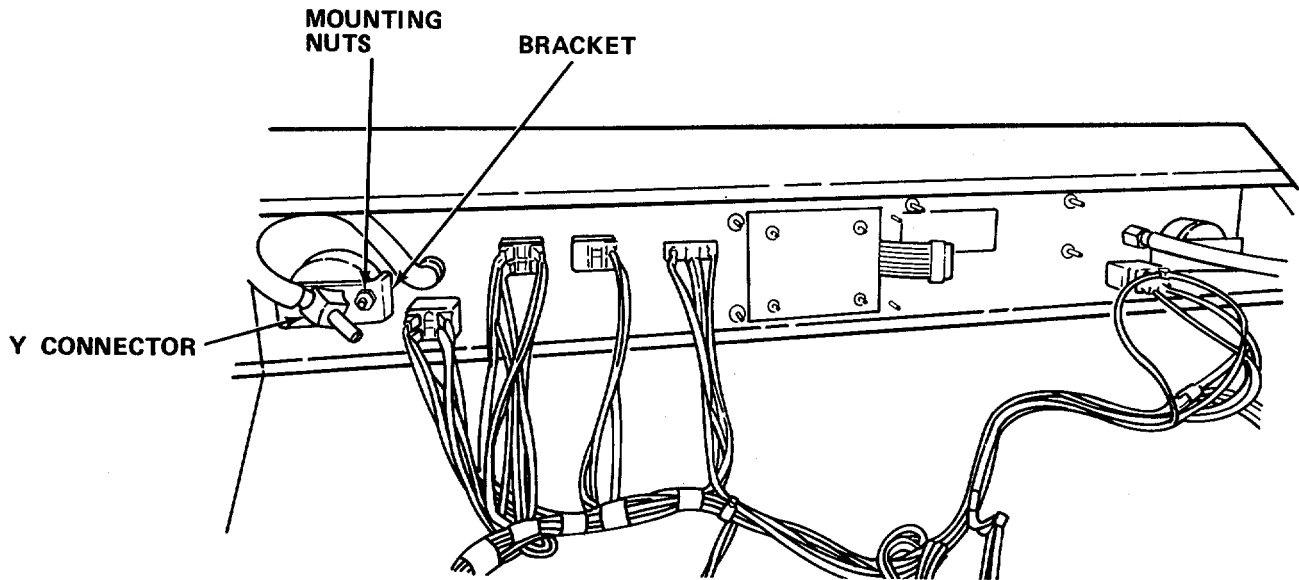
- a. Turn off power panel circuit breaker.



- b. Pull out frame release knob and flip glass frame into vertical position.



- c. Remove mounting screws for control panel.
 d. Carefully lift control panel from its mount to gain access to wiring.



- e. Remove Y hose connector from back side of vacuum gage.
- f. Remove two mounting nuts from vacuum gage and remove defective vacuum gage, with bracket and y hose connector, through top of control panel.
- g. Install new vacuum gage through top of control panel and place mounting bracket around gage so that mounting studs fit through the holes. Attach in place with mounting nuts. Be sure gage is properly centered on panel.
- h. Reinstall Y hose connector on back side of vacuum gage.
- i. Carefully lift control panel onto its mount.
- j. Reinstall mounting screws for control panel.
- k. Rotate glass frame into horizontal position and lock into place with frame release knob.
- l. Turn on power panel circuit breaker.

2-16.12 Replace Power Switch(es).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

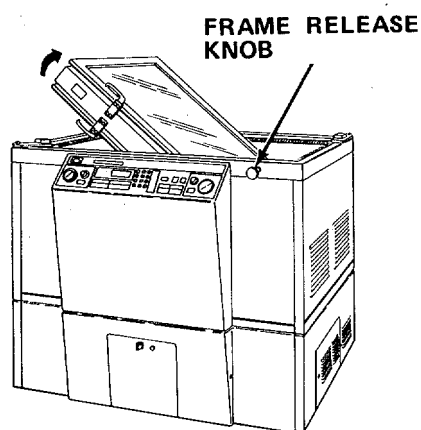
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Hex head Key Wrench Set
 Slip Joint Pliers

SUPPLIES: Power Duty PB Switch(es)

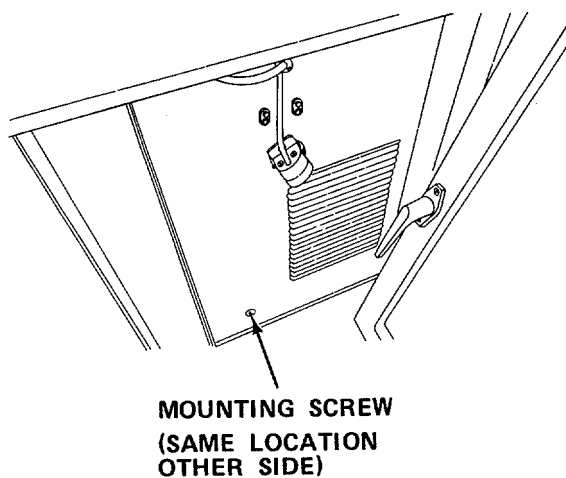
WARNING

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

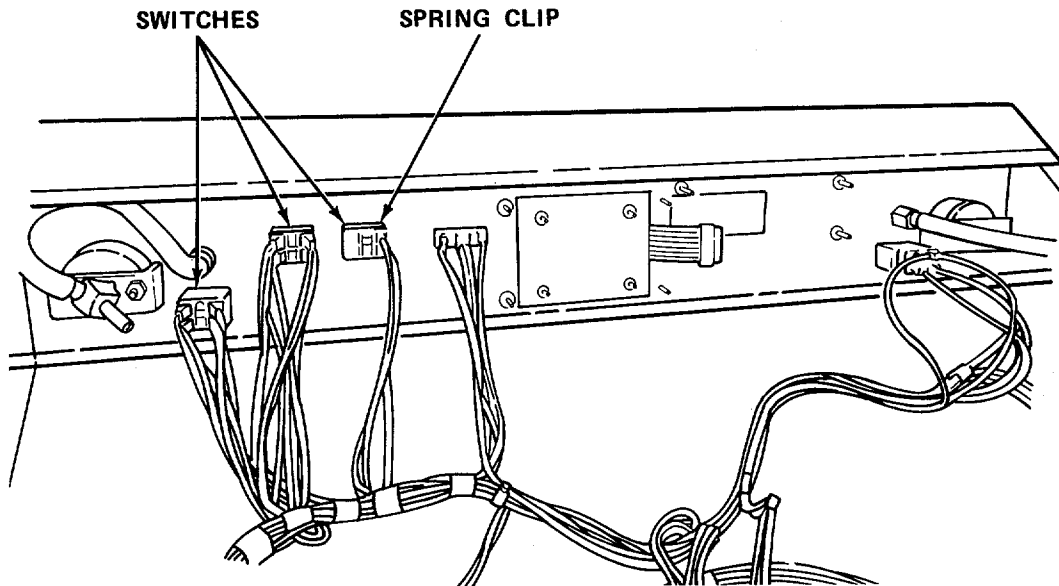
- a. Turn off power panel circuit breaker.



- b. Pull out frame release knob and flip glass frame into vertical position.



- c. Remove mounting screws for control panel.
- d. Carefully lift control panel from its mount to gain access to wiring.



- e. Tag and disconnect wires from defective switch.
- f. Push in spring clip retainer around switch and remove defective switch through top of control panel.
- g. Install new switch through top of control panel and snap into place.
- h. Reconnect wiring to new switch.
- i. Carefully lift control panel onto its mount.
- j. Reinstall mounting screws for control panel.
- k. Rotate glass frame into horizontal position and lock into place with frame release knob.
- l. Turn on power panel circuit breaker.

2-16.13 Replace POWER ON Pilot/Exposing Indicator Lamps.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

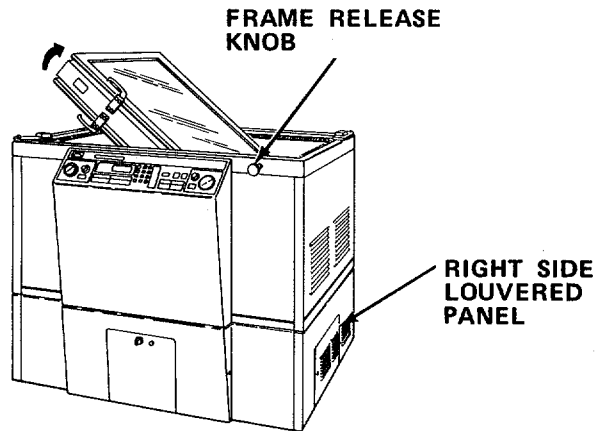
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Hex Head Key Wrench Set
 Slip Joint Pliers

SUPPLIES: Indicator Lamp

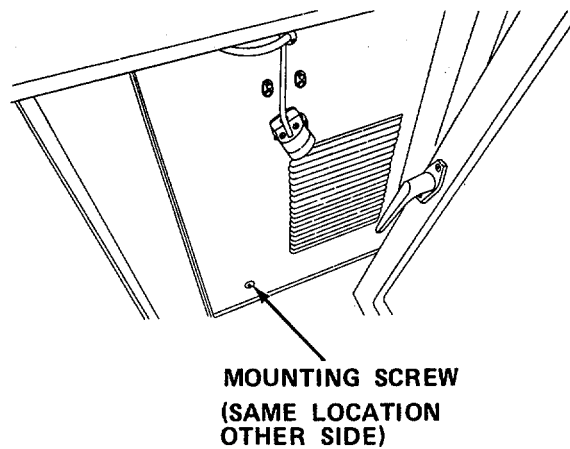
WARNING

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

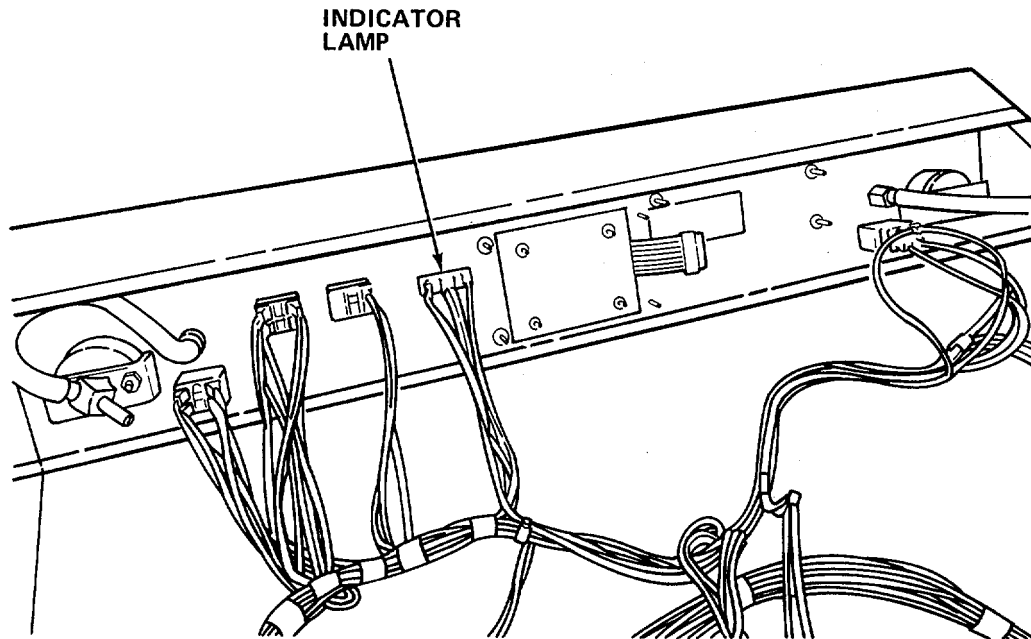
- a. Turn off power panel circuit breaker.



- b. Pull out frame release knob and flip glass frame into vertical position.



- c. Remove mounting screws for control panel.
- d. Carefully lift control panel from its mount to gain access to wiring.



- e. Tag and disconnect wires from defective indicator lamp.
- f. Push in spring clip retainer around indicator and remove defective indicator lamp through top of control panel.
- g. Install new indicator lamp through top of control panel and snap into place.
- h. Reconnect wiring to new indicator.
- i. Carefully lift control panel onto its mount.
- j. Reinstall mounting screws for control panel.
- k. Rotate glass frame into horizontal position and lock into place with frame release knob.
- l. Turn on power panel circuit breaker.

2-16.14 Replace Vacuum Bleed Valve.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

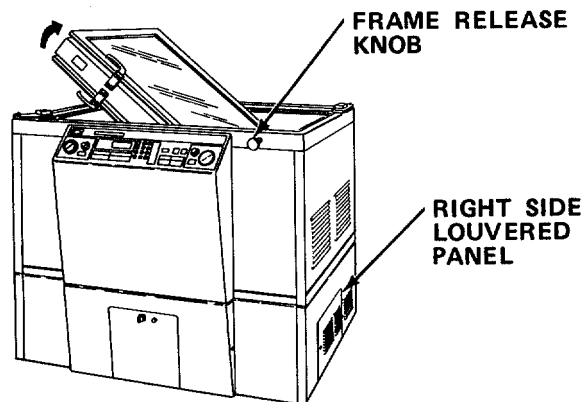
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Hex Head Key Wrench Set
 Combination Wrench Set
 Pliers

SUPPLIES: Vacuum Bleed Valve

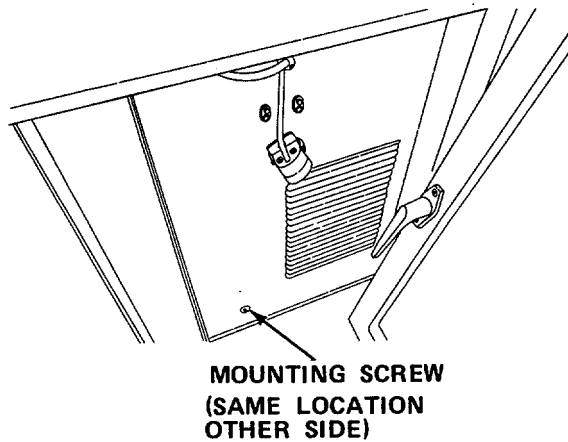
WARNING

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

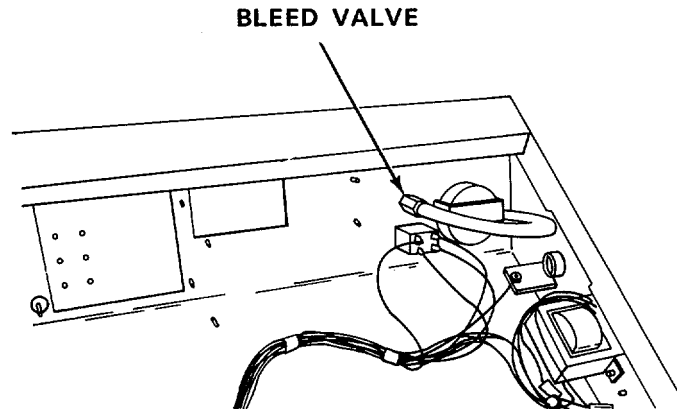
- a. Turn off power panel circuit breaker.



- b. Pull out frame release knob and flip glass frame into vertical position.



- c. Remove mounting screws for control panel.
- d. Carefully lift control panel from its mount to gain access to wiring.



- e. Remove vacuum bleed valve control knob by turning left until knob and needle valve are removed.
- f. Remove vacuum hose from hose connector on bottom of bleed valve.
- g. Remove locknut from top of vacuum bleed valve and remove defective bleed valve.
- h. Remove hose connector from bleed valve.
- i. Reinstall hose connector to new bleed valve.
- j. Install new vacuum bleed valve and locknut.
- k. Reinstall vacuum hose to hose connector.
- l. Loosen setscrew on vacuum bleed valve control knob and remove defective needle valve.
- m. Install new needle valve into control knob and tighten setscrew.
- n. Reinstall vacuum bleed valve control knob and needle valve by inserting into bleed valve and turning right until valve is closed.
- o. Carefully lift control panel onto its mount.
- p. Reinstall mounting screws for control panel.
- q. Rotate glass frame into horizontal position and lock into place with frame release knob.
- r. Turn on power panel circuit breaker.

2-16.15 Replace Filament Transformer (FLT-1).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

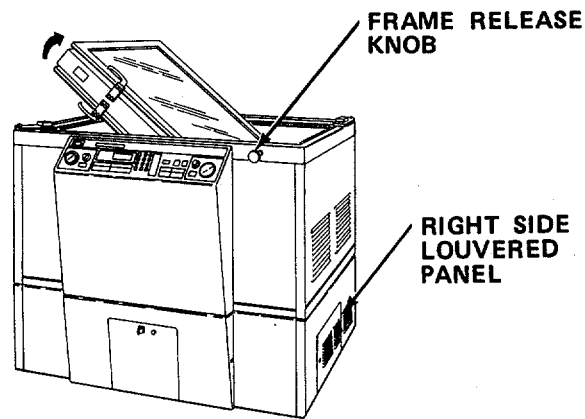
- Tool Kit, Light Machine Repair
- Flat Tip Screwdriver
- Hex Head Key Wrench Set
- Combination Wrench Set
- Slip Joint Pliers

SUPPLIES: Filament Transformer

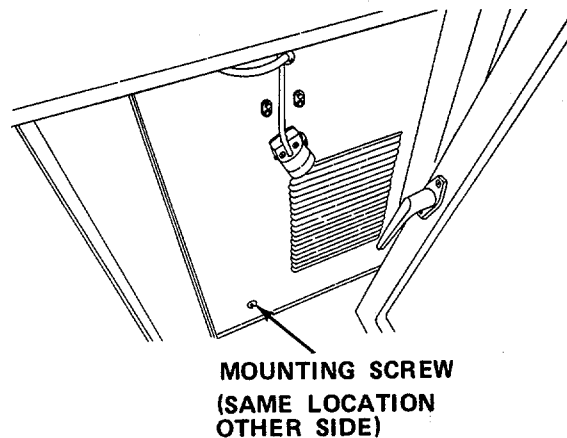
WARNING

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

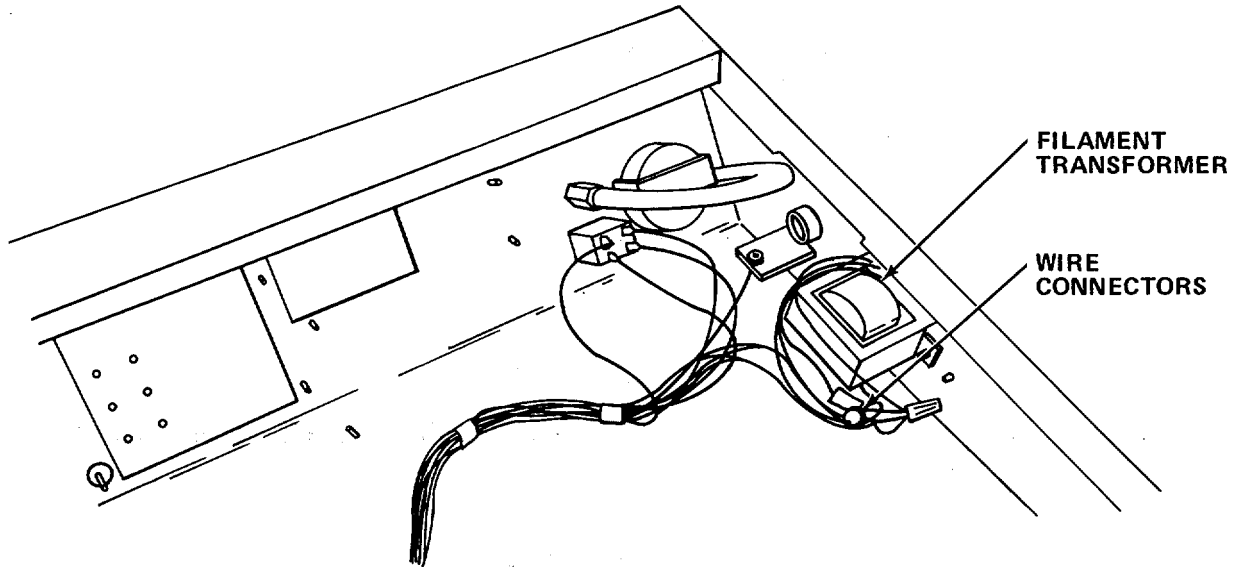
- a. Turn off power panel circuit breaker.



- b. Pull out frame release knob and flip glass frame into vertical position.



- c. Remove mounting screws for control panel.
- d. Carefully lift control panel from its mount to gain access to wiring.



- e. Tag and disconnect wires for filament transformer.
- f. Remove nuts and screws, and defective filament transformer.
- g. Install new filament transformer and secure with screws and nuts.
- h. Reconnect wiring for new filament transformer.
- i. Carefully lift control panel onto its mount.
- j. Reinstall mounting screws for control panel.
- k. Rotate glass frame into horizontal position and lock into place with frame release knob.
- l. Turn on power panel circuit breaker.

2-16.16 Replace Master Circuit Breaker (CB1).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

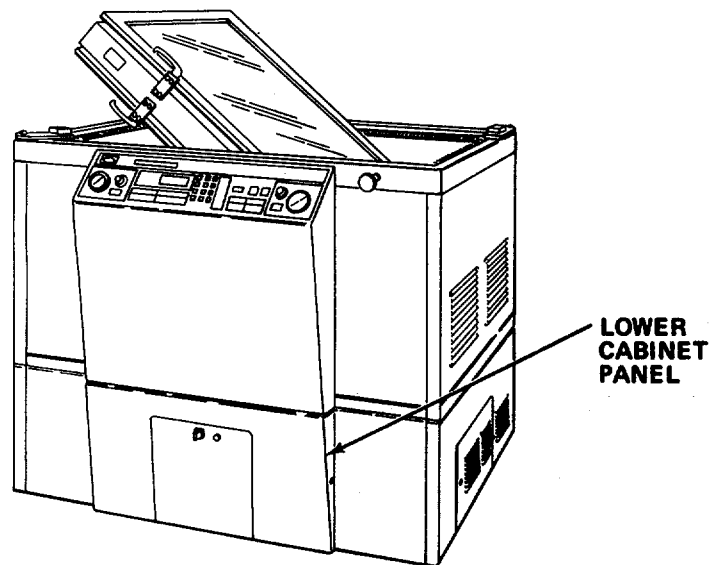
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Hex Head Key Wrench Set
Slip Joint Pliers
Extension Light

SUPPLIES: Circuit Breaker 5 Amp

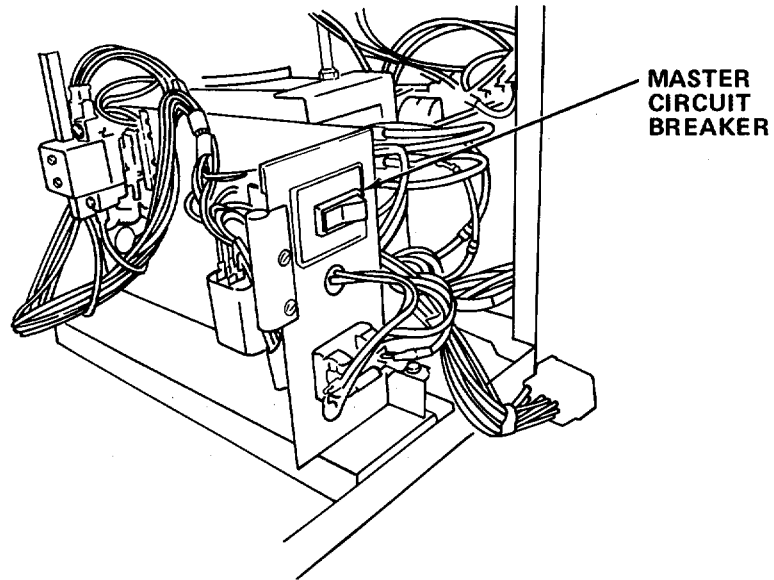
WARNING

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

- a. Turn off power panel circuit breaker.



- b. Remove two screws and lower cabinet panel.



- c. Tag and disconnect wires from master circuit breaker.
- d. Push in spring clip retainer around circuit breaker and remove defective circuit breaker.
- e. Install new circuit breaker and snap into place.
- f. Reconnect wiring to new circuit breaker.
- g. Reinstall lower cabinet panel.
- h. Turn on power panel circuit breaker.

2-16.17 Replace Vacuum Pumps Relay (K3).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

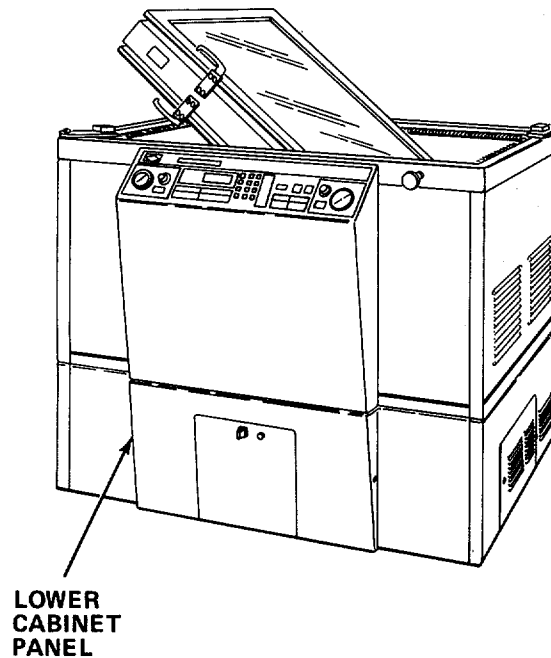
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Hex Head Key Wrench Set
 Slip Joint Pliers

SUPPLIES: 3PDT Sealed Relay 230 V

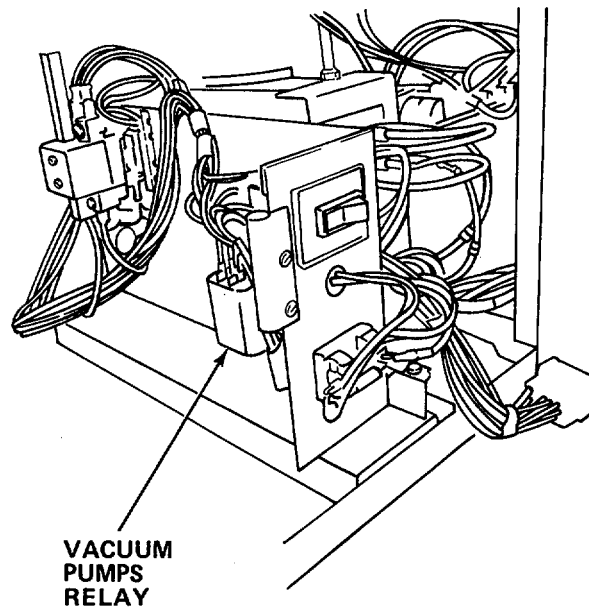
WARNING

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

- a. Turn off power panel circuit breaker.



- b. Remove two screws and lower cabinet panel.



- c. Tag and disconnect wires from vacuum pumps relay.
- d. Remove mounting screws and defective vacuum pumps relay.
- e. Install new vacuum pumps relay.
- f. Reconnect wiring for new vacuum pumps relay.
- g. Reinstall lower cabinet panel.
- h. Turn on power panel circuit breaker.

2-16.18 Replace Lower Cabinet Door Proximity Switch (PXI).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

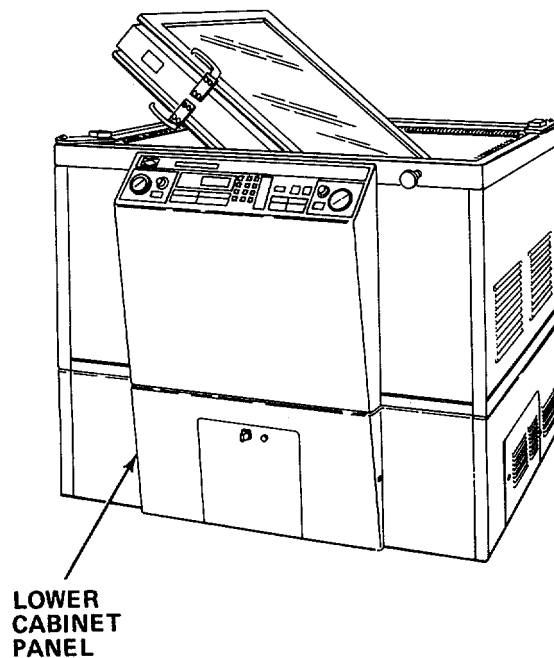
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Hex Head Key Wrench Set

SUPPLIES: Proximity Switch

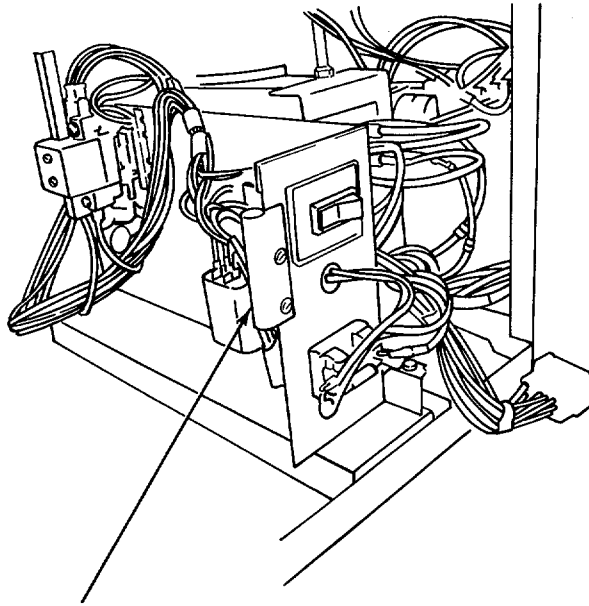
WARNING

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

- a. Turn off power panel circuit breaker.



- b. Remove two screws and lower cabinet panel.



**LOWER CABINET DOOR
PROXIMITY SWITCH**

- c. Tag and disconnect wires for lower cabinet door proximity switch.
- d. Remove mounting screws and defective lower cabinet door proximity switch.
- e. Install new lower cabinet door proximity switch.
- f. Reconnect wiring for proximity switch.
- g. Reinstall lower cabinet panel.
- h. Turn on power panel circuit breaker.

2-16.19 Replace Autoformer Relay (K2).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

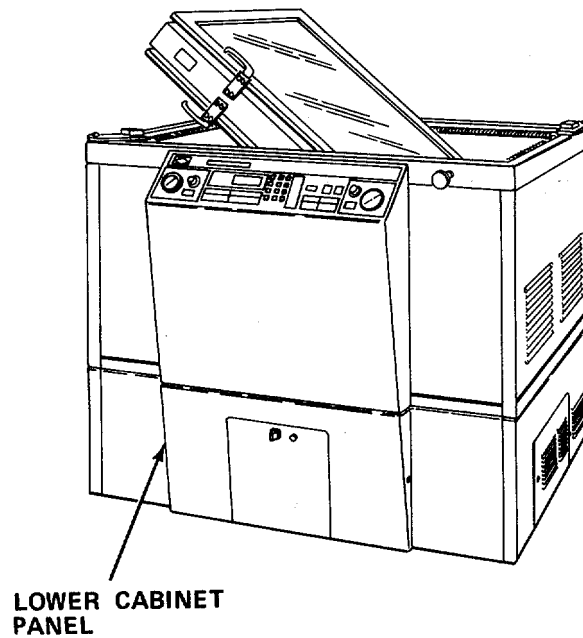
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Hex Head Key Wrench Set

SUPPLIES: Contactor 25A, 230 V

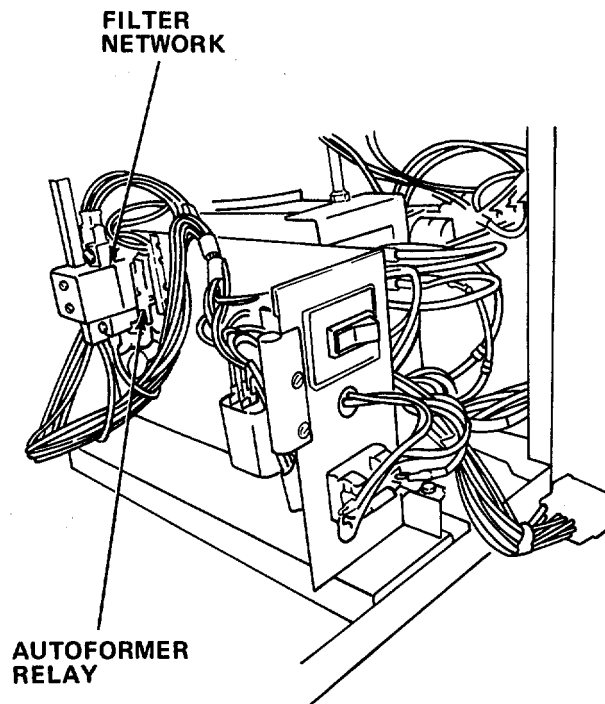
WARNING

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

- a. Turn off power panel circuit breaker.



- b. Remove two screws and lower cabinet panel.



- c. Tag and disconnect filter network from top of autoformer relay.
- d. Tag and disconnect wires from autoformer relay.
- e. Remove mounting screws and defective autoformer relay.
- f. Install new autoformer relay.
- g. Reconnect wiring to new autoformer relay.
- h. Reconnect filter network on top of autoformer relay.
- i. Reinstall lower cabinet panel.
- j. Turn on power panel circuit breaker.

2-16.20 Replace Autoformer (XTI).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

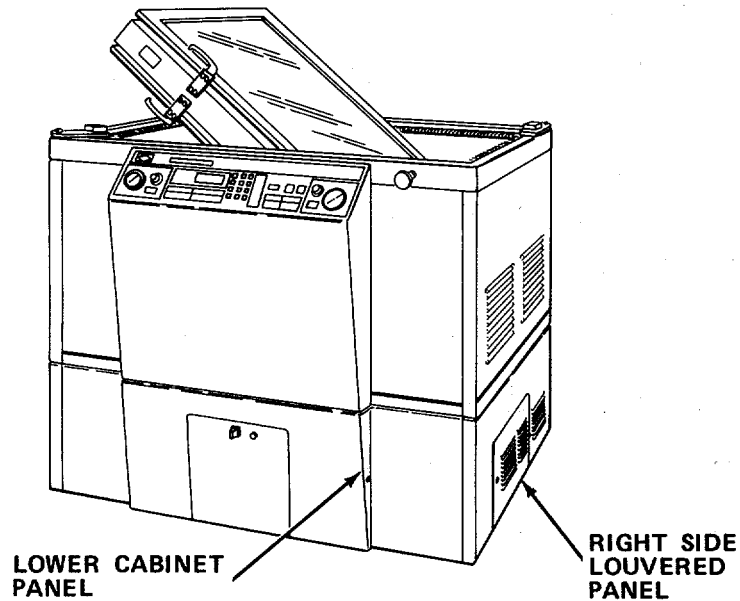
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Hex Head Key Wrench Set

SUPPLIES: 3kW Autoformer

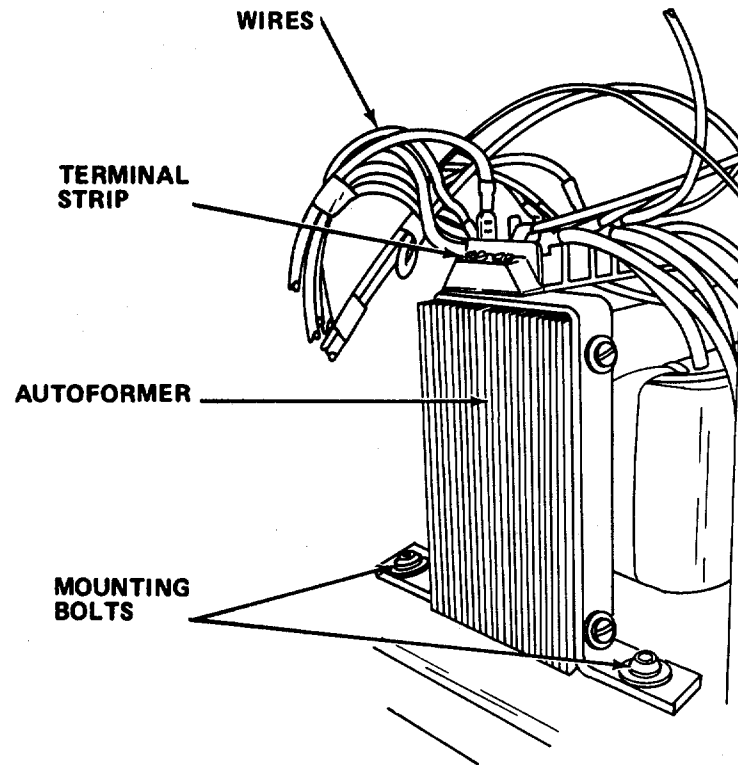
WARNING

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

- a. Turn off power panel circuit breaker.



- b. Remove two screws and lower cabinet panel.
- c. Remove right side louvered panel.



- d. Tag and disconnect wires from autoformer terminal strip.
- e. Remove mounting bolts and defective autoformer.
- f. Install new autoformer and mounting bolts.
- g. Reconnect wiring to autoformer.
- h. Reinstall right side louvered panel.
- i. Reinstall lower cabinet panel.
- j. Turn on power panel circuit breaker.

2-16.21 Flush Vacuum Pump(s).

MOS: 83FJ6, Reproduction Equipment Repairer

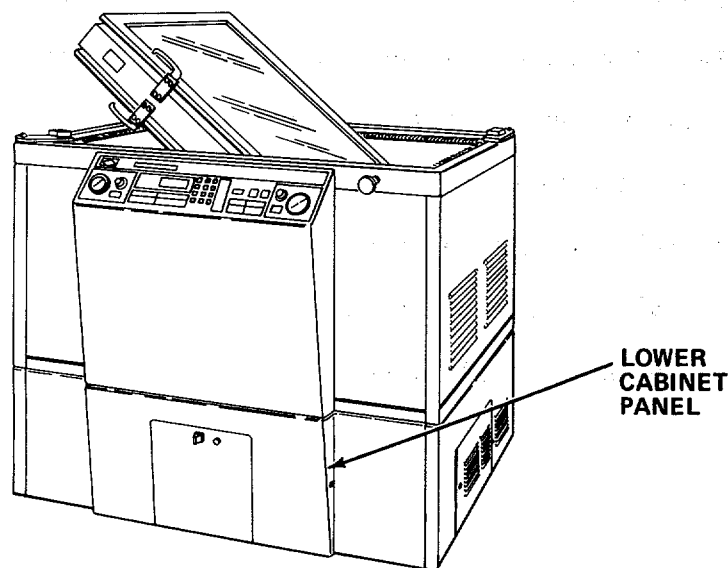
TOOLS:

Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Hex Head Key Wrench Set
Tool Kit, Precision
Permanent Magnet

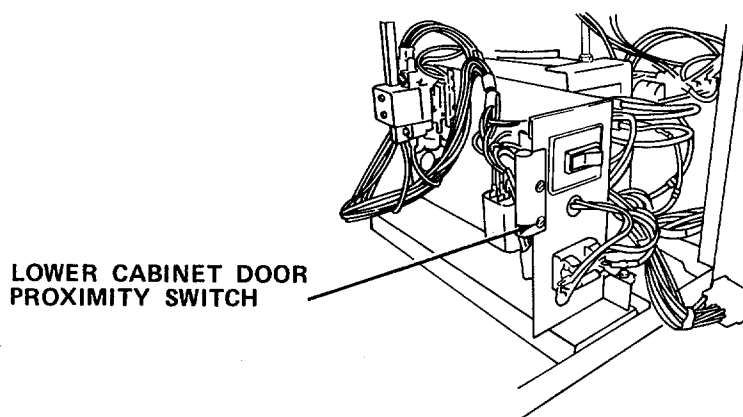
SUPPLIES: Nonflammable Flushing Solvent (Item 54, Appendix E)
Rubber Matting

WARNING

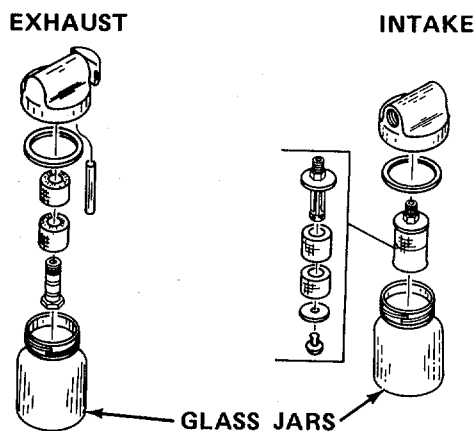
- Electrical shock hazard. You must stand on rubber matting while performing this procedure. Death or serious injury may occur.
- Always wear eye/face protective equipment when using solvent to prevent injury to eyes.
- Fumes and chemicals used in flushing vacuum pump may result in serious injury if personnel do not operate equipment with proper ventilation.
 - a. Turn off power panel circuit breaker.



- b. Remove two screws and lower cabinet panel.



- c. Tape magnet over proximity switch.



- d. Remove glass jars from around intake and exhaust.
- e. Carefully remove intake and exhaust filter assemblies.
- f. Turn on power panel circuit breaker.
- g. Turn on vacuum pump switch for vacuum pump being flushed.
- h. Introduce 1 to 2 ounces of solvent into inlets.
- i. Turn off vacuum pump switch.
- j. Turn off power panel circuit breaker.
- k. Carefully install intake and exhaust filter assemblies.
- l. Reinstall glass jars around intake and exhausts.
- m. Remove tape and magnet from proximity switch.
- n. Reinstall lower cabinet panel.
- o. Turn on power panel circuit breaker.

2-16.22 Remove/Install Flip-Top Platemaker.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Three persons are required to perform this procedure.

TOOLS:

Tool Kit, Light Machine Repair

Flat Tip Screwdriver

Combination Wrench Set

Hex head Key Wrench Set

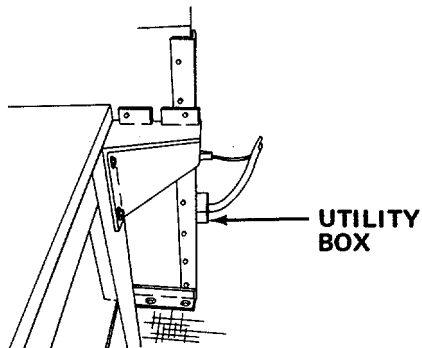
3/8 in. Socket Set

Fork Lift

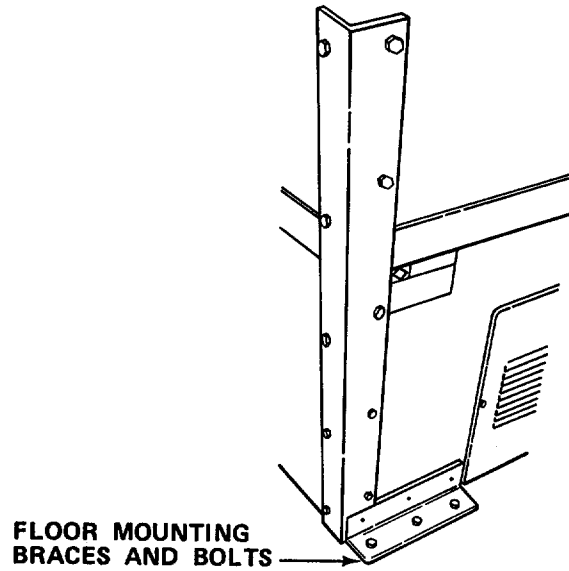
SUPPLIES: Flip-Top Platemaker

WARNING

- Death or serious injury may occur from electrical shock unless power is turned off before servicing.
- Serious injury may occur if inadequate number of personnel are used to remove/install this equipment. The flip-top platemaker weighs 500 lbs.
 - a. Turn off power panel circuit breaker.



- b. Loosen two screws and remove utility box cover.
- c. Tag and disconnect input power wires.
- d. Remove glass light shield and store in glass holder.
- e. Position two vacuum frame holddown brackets to secure vacuum frame.
- f. Remove metal halide exposure lamp and store.
- g. Remove conduit locking nut, and remove conduit from utility box.



- h. Remove all floor mounting bolts.
- i. Using fork lift, remove defective flip-top platemaker through rear cargo door.
- j. Install new flip-top platemaker through rear cargo door.
- k. Reinstall all floor mounting bolts.
- l. Install conduit in utility box and secure with conduit locking nut.
- m. Reconnect input power wires.
- n. Reinstall utility box cover and tighten screws.
- o. Turn on power panel circuit breaker.

2-16.23 Replace Photodetector Assembly (PE1).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

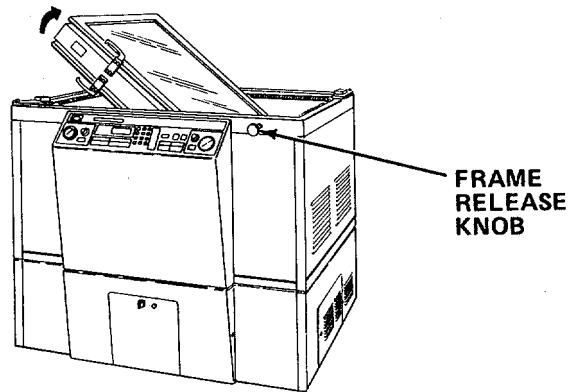
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Hex Head Key Wrench Set
Slip Joint Pliers

SUPPLIES: Photodetector Assembly

WARNING

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

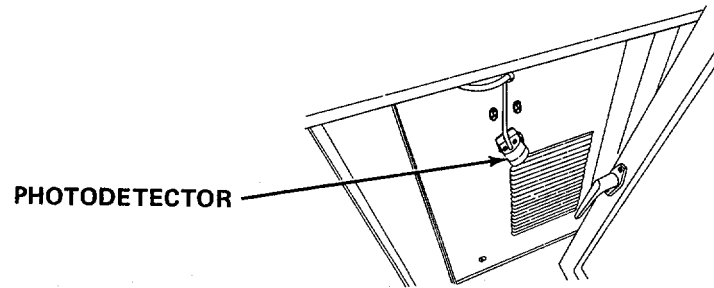
- a. Turn off power panel circuit breaker.



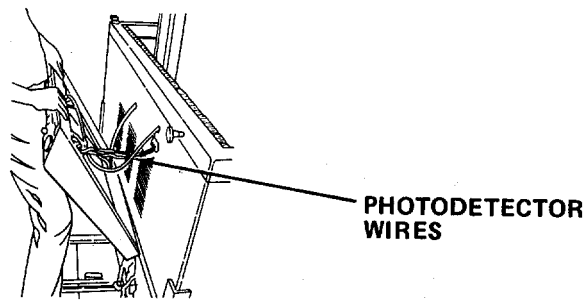
- b. Pull out frame release knob and flip glass frame into vertical position.

CAUTION

When working inside platemaker, ensure that no tools or heavy objects strike the glass light shield.



- c. Remove mounting screws holding photodetector assembly and set assembly aside.
- d. Remove screws for control panel.
- e. Carefully lift control panel from its mount to gain access to control circuit board.



- f. Tag and disconnect wires for photodetector assembly.
- g. Remove defective photodetector assembly from inside housing.
- h. Feed wires from new photodetector assembly from inside housing and connect wires to control circuit board.
- i. Secure photodetector assembly in place with mounting screws.
- j. Carefully lift control panel onto its mount and fit into place.
- k. Reinstall mounting screws for control panel.
- l. Rotate glass frame into horizontal position and lock into place with frame release knob.
- m. Turn on power panel circuit breaker.
- n. Check adjustment of photodetector assembly by producing a plate. Adjust as necessary (paragraph 2-10.2).

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

Section V. DIRECT/GENERAL SUPPORT MAINTENANCE

2-18. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT.

2-18.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

2-18.2 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.

2-18.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-3610-285-24P covering direct/general support maintenance for this equipment.

2-19. 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 always 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.

Table 2-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

1. KEYPAD INPUTS ARE NOT RECOGNIZED.

- (a) Replace keypad (paragraph 2-20.4).
- (b) If problem remains, replace control circuit board (paragraph 2-20.2).

2. DIGITAL DISPLAY DISPLAYS INCORRECT DATA OR DOES NOT SHOW ANYTHING.

- (a) Replace keypad (paragraph 2-20.4).
- (b) If problem persists, replace control circuit board (paragraph 2-20.2).
- (c) If problem persists, replace digital display board (paragraph 2-20.3).

3. EXPOSURE TIME VARIES NOTICEABLY DESPITE USING SAME UNITS OF LIGHT.

Check operation of timer circuits on control circuit board as follows:

- (a) Remove integrator circuit board from control circuit board in accordance with paragraph 2-20.1.
- (b) Turn on flip top platemaker and enter in 20.0 units of light.
- (c) Press "T" key and verify timer elapses in 20 seconds. Repeat this several times and verify timer elapses in 20 seconds each time.
 - (1) If timer elapses in more or less than 20 seconds, replace control circuit board (paragraph 2-20.2).

Table 2-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

3. EXPOSURE TIME VARIES NOTICEABLY DESPITE USING SAME UNITS OF LIGHT - Cont

- (2) If timer elapses correctly, replace integrator circuit board (paragraph 2-20.1).
- (3) If problem remains, replace photodetector assembly (paragraph 2-16.23).

4. EXPOSURE LAMP DOES NOT OPERATE IN AUTOMATIC MODE.

- (a) Replace control circuit board (paragraph 2-20.2).
- (b) If problem remains, replace integrator circuit board (paragraph 2-20.1).

5. EXPOSURE LAMP DOES NOT OPERATE IN ANY MODE OF OPERATION .

Check continuity of strike transformers as follows:

- (a) Turn off power panel circuit breaker.
 - (b) Disconnect plug connector for each transformer from 3kW power supply circuit board.
 - (c) Using multimeter, check primary side of transformers at plug connectors for continuity.
 - (d) Connect one multimeter lead on terminal board for autotransformer, and the other lead on fuse clip for exposure lamp and check continuity of transformer's secondary sides.
 - (1) If all continuity checks are good, replace 3kW power supply circuit board (paragraph 2-20.5).
 - (2) If any continuity check fails, replace defective strike transformer (paragraph 2-20.6).
-

2-20. MAINTENANCE PROCEDURES.

- a. This section contains instructions covering direct/general support maintenance functions for the flip-top platemaker. 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

PROCEDURE	PARAGRAPH
Replace Integrator Circuit Board (ICB)	2-20.1
Replace Control Circuit Board (CCB)	2-20.2
Replace Digital Display Board (DD).....	2-20.3
Replace Keypad (KP).....	2-20.4
Replace 3kW Power Supply Circuit Board (PSI)	2-20.5
Replace Strike Transformer (ST-1 or 2).....	2-20.6
Replace Strike Transformer Overtemperature Switch (THS1 or 2)	2-20.7

2-20.1 Replace Integrator Circuit Board (ICB).

MOS: 35E, Special Electronic Devices, Repairer

TOOLS:

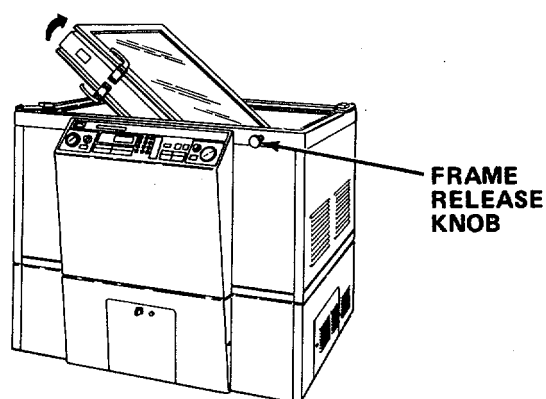
Tool Kit, Electronic Repair
Hex Head Key Wrench Set

SUPPLIES: Integrator Circuit Board

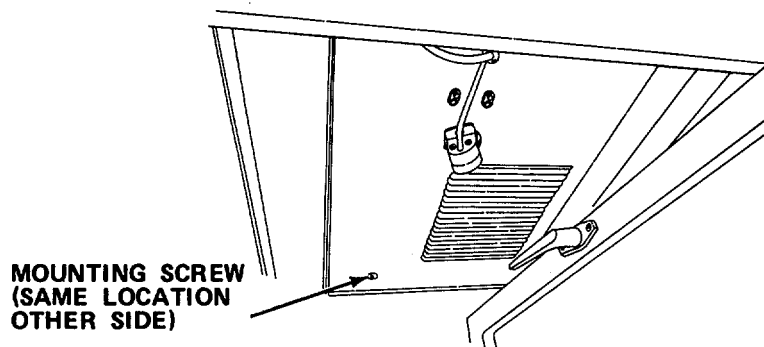
WARNING

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

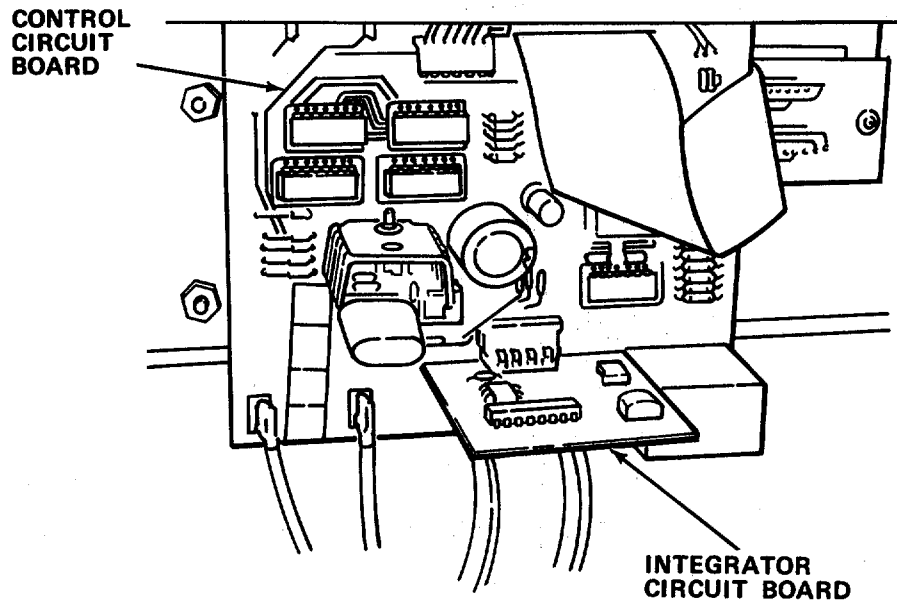
- a. Turn off power panel circuit breaker.



- b. Pull out frame release knob and flip glass frame into vertical position.



- c. Remove mounting screws for control panel.
- d. Carefully lift control panel from its mount to gain access to wiring.



- e. Carefully pull defective integrator circuit board from control circuit board.
- f. Install new integrator circuit board on control circuit board.
- g. Carefully lift control panel onto its mount.
- h. Reinstall mounting screws for control panel.
- i. Rotate glass frame into horizontal position and lock into place with frame release knob.
- j. Turn on power panel circuit breaker.

2-20.2 Replace Control Circuit Board (CCB).

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

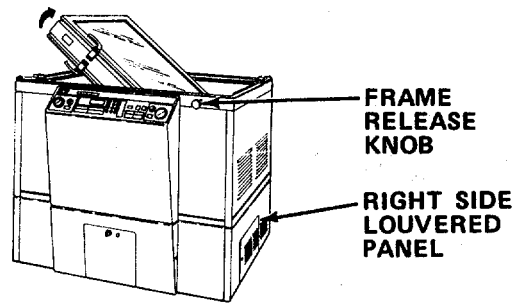
Tool Kit, Electronic Repair
 Hex Head Key Wrench Set
 Slip Joint Pliers

SUPPLIES: Control Circuit Board

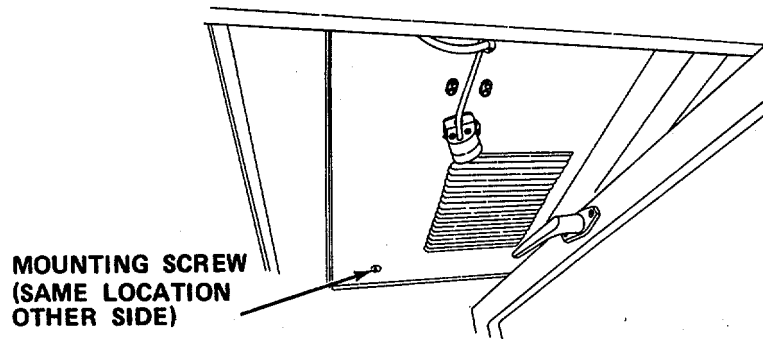
WARNING

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

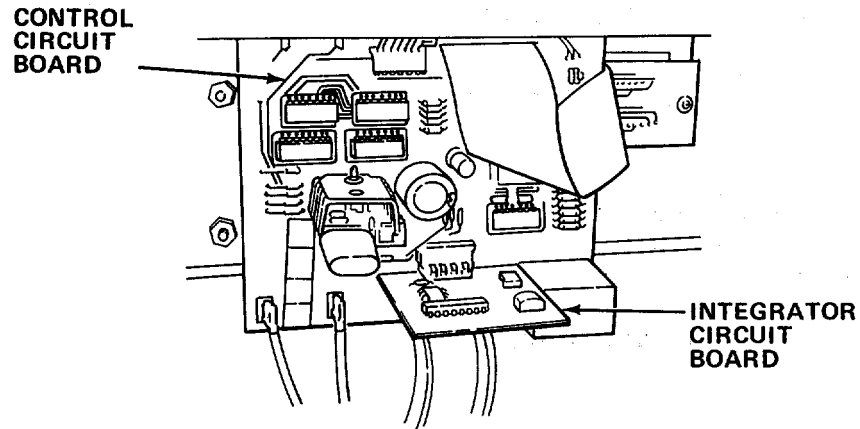
- a. Turn off power panel circuit breaker.



- b. Pull out frame release knob and flip glass frame into vertical position.



- c. Remove mounting screws for control panel.
 d. Carefully lift control panel from its mount to gain access to wiring.



- e. Carefully pull integrator circuit board from control circuit board.
- f. Tag and disconnect wires from control circuit board.

CAUTION

The keypad may be adhered to back of nameplate. To prevent damage to equipment, remove timer plate mounting frame carefully.

NOTE

Leave spacers on studs when removing timer plate mounting frame.

- g. Remove four self-locking nuts and timer plate mounting frame with circuit board attached.

NOTE

Note how ribbon cable is installed prior to removal.

- h. Remove ribbon cable for digital displays from control circuit board.
- i. Press in on prongs on circuit board supports, and remove defective control circuit board.
- j. Carefully remove ribbon cable from underside of defective control circuit board.
- k. Carefully reinstall ribbon cable on underside of new control circuit board.
- l. Install new control-circuit board onto supports and snap in place over prongs.

- m. Reinstall ribbon cable for digital display onto control circuit board as previously noted.
- n. Install timer plate mounting frame, with control circuit board attached. Secure with four self-locking nuts.
- o. Reconnect wiring to control circuit board.
- p. Install integrator circuit board onto control circuit board.
- q. Carefully lift control panel onto its mount.
- r. Reinstall mounting screws for control panel.
- s. Rotate glass frame into horizontal position, and lock into place with frame release knob.
- t. Turn on power panel circuit breaker.

2-20.3 Replace Digital Display Board (DD).

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

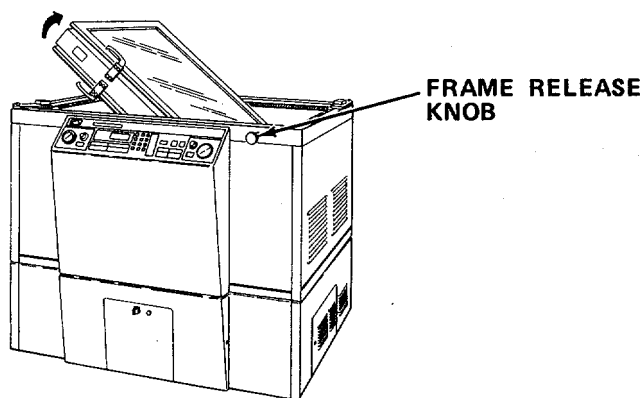
- Tool Kit, Electronic Repair
- Flat Tip Screwdriver
- Hex Head Key Wrench Set
- Nut Driver Set

SUPPLIES: Digital Display Board

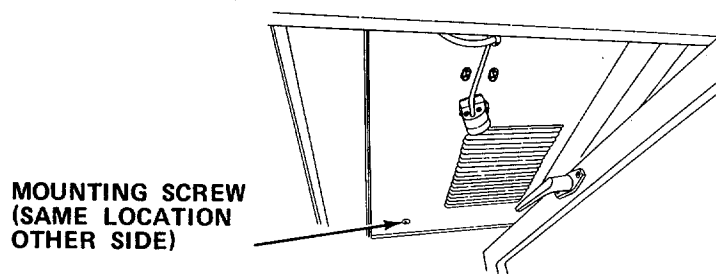
WARNING

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

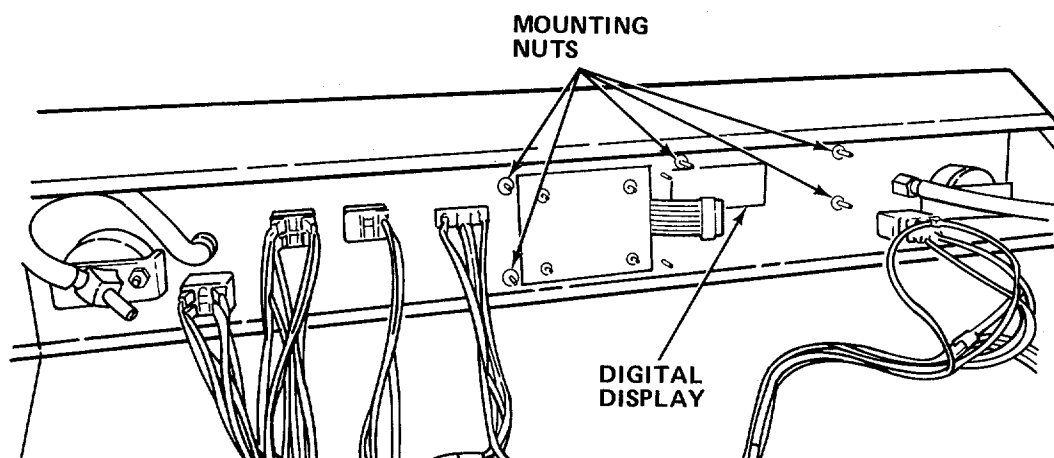
- a. Turn off power panel circuit breaker.



- b. Pull out frame release knob and flip glass frame into vertical position.



- c. Remove mounting screws for control panel.
- d. Carefully lift control panel from its mount to gain access to wiring.
- e. Carefully pull integrator circuit board from control circuit board.
- f. Tag and disconnect wires from control circuit board.



CAUTION

The key pad may be adhered to back of nameplate. To prevent damage to Equipment, remove timer plate mounting frame carefully.

- g. Remove four self-locking nuts, spacers, and timer plate mounting frame with circuit board attached.

NOTE

Note how ribbon cable is installed prior to removal.

- h. Disconnect ribbon cable from digital display board.
- i. Press in on prongs on circuit board supports and remove defective control circuit board.

- j. Carefully remove ribbon cable from underside of control circuit board.
- k. Remove mounting bolts and defective digital display board.
- l. Install new digital display board and mounting bolts.
- m. Carefully reinstall ribbon cable on underside of control circuit board.
- n. Install control circuit board onto supports and snap in place over prongs.
- o. Reconnect ribbon cable onto digital display board.
- p. Reinstall spacers, timer plate mounting frame, and secure with self-locking nuts.
- q. Reconnect wires to control circuit board.
- r. Install integrator circuit board onto control circuit board.
- s. Carefully lift control panel onto its mount.
- t. Reinstall mounting screws for control panel.
- u. Rotate glass frame into horizontal position, and lock into place with frame release knob.
- v. Turn on power panel circuit breaker.

2-20.4 Replace Keypad (KP).

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

Tool Kit, Electronic Repair

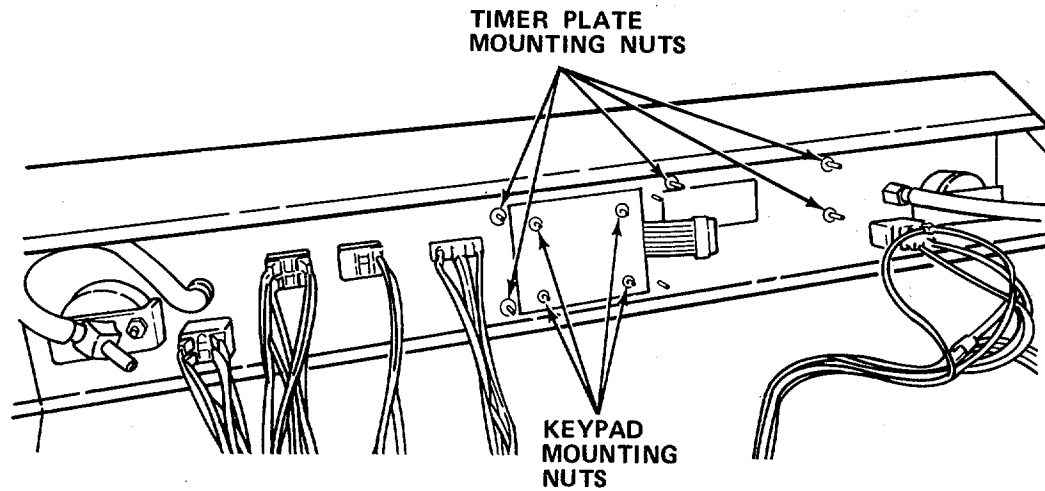
Flat Tip Screwdriver

Hex Head Key Wrench

Nut Driver Set

SUPPLIES: Monoswitch Keypad

- a. Perform steps a-j of paragraph 2-20.2 to remove control circuit board.



- b. Remove four nuts, spacers and carefully remove defective keypad and ribbon cable.
- c. Carefully install new keypad and ribbon cable and mount in place with nuts and spacers.
- d. Carefully reinstall ribbon cable on underside of control circuit board.
- e. Install control circuit board onto supports and snap in place over prongs.
- f. Reconnect ribbon cable onto digital display board.
- g. Reinstall timer plate mounting frame, spacers and nuts.
- h. Carefully lift control panel onto its mount.
- i. Reinstall mounting screws for control panel.
- j. Rotate glass frame into horizontal position and lock into place with frame release knob.
- k. Turn on power panel circuit breaker.

2-20.5 Replace 3kW Power Supply Circuit Board (PS1).

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

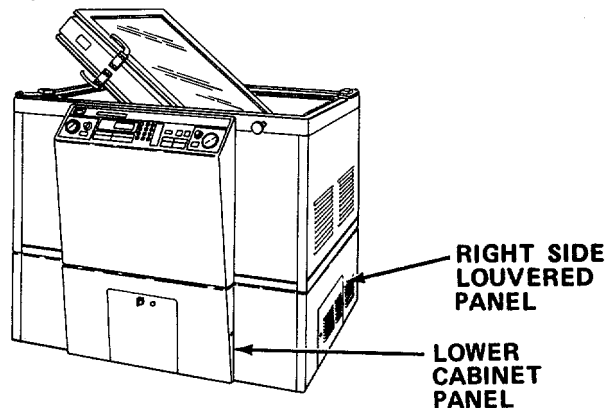
Tool Kit, Electronic Repair
 Flat Tip Screwdriver
 Hex Head Key Wrench Set
 Slip Joint Pliers

SUPPLIES: 3kW 100 V Circuit Board

WARNING

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

- a. Turn off power panel circuit breaker.

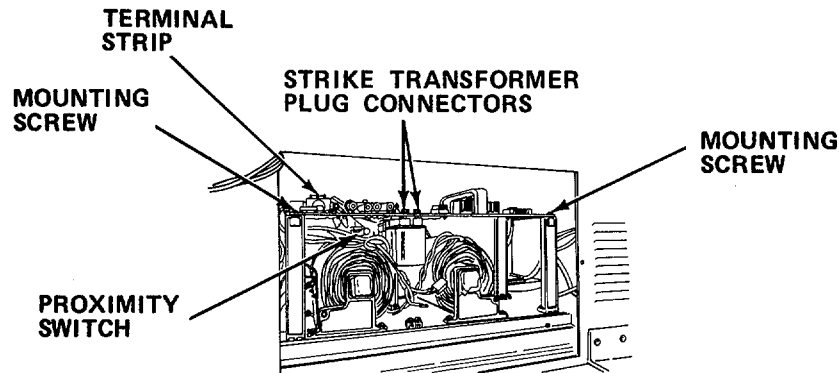


- b. Remove two screws and lower cabinet panel.
 c. Remove two screws and right side louvered panel.
 d. Remove two hex head screws, flat washers, and star washers from base of power supply.
 e. Tag and disconnect top overtemperature switch leads from each strike transformer.
 f. Tag and disconnect wires from terminals 1 through 5 on autoformer terminal strip.

CAUTION

Power supply now remains wired in back by two power cables only. Remove power supply carefully to prevent damage to equipment.

- g. Maneuver power supply carefully out of platemaker, and position on floor.



- h. Tag and disconnect wires from power supply terminal strip.
- i. Tag and disconnect plug connectors for strike transformers.
- j. Tag and disconnect wires for strike transformer #2 proximity switch.
- k. Remove mounting screws and wire retaining clips for circuit board, and remove defective 3kW power supply circuit board.
- l. Remove strike transformer #2 proximity switch from defective power supply circuit board.
- m. Install strike transformer #2 proximity switch on new power supply circuit board.
- n. Install new 3kW power supply circuit board, mounting screws, and wire retaining clips onto supports.
- o. Reconnect wires for strike transformer #2 proximity switch.
- p. Reconnect plug connectors for strike transformers.
- q. Reconnect wires to power supply terminal strip.
- r. Carefully reposition power supply in platemaker.
- s. Reconnect wires on terminals 1 through 5 on autoformer terminal strip.
- t. Reconnect top overtemperature switch leads to each strike transformer.
- u. Secure power supply to platemaker chassis with two hex head screws, flat washers, and star washers.
- v. Reinstall right side louvered panel.
- w. Reinstall lower cabinet panel.
- x. Turn on power panel circuit breaker.

2-20.6 Replace Strike Transformer (ST-1 or 2).

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

Tool Kit, Electronic Repair
Flat Tip Screwdriver
Hex Head Key Wrench Set
Slip Joint Pliers

SUPPLIES: 3kW Strike Transformer

WARNING

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

- a. Perform steps a-k of paragraph 2-20.5 to remove 3kW power supply circuit board.
- b. Tag and disconnect wires for defective strike transformer.
- c. Loosen mounting screws for both high voltage and coil insulator brackets, and remove defective strike transformer.
- d. Install new strike transformer onto high voltage and coil insulator brackets and tighten mounting screws.
- e. Reconnect wires for new strike transformer that was removed in step b.
- f. Perform steps n-x of paragraph 2-20.5 to install 3kW power supply circuit board.

2-20.7 Replace Strike Transformer Overtemperature Switch (THS1 or THS2).

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

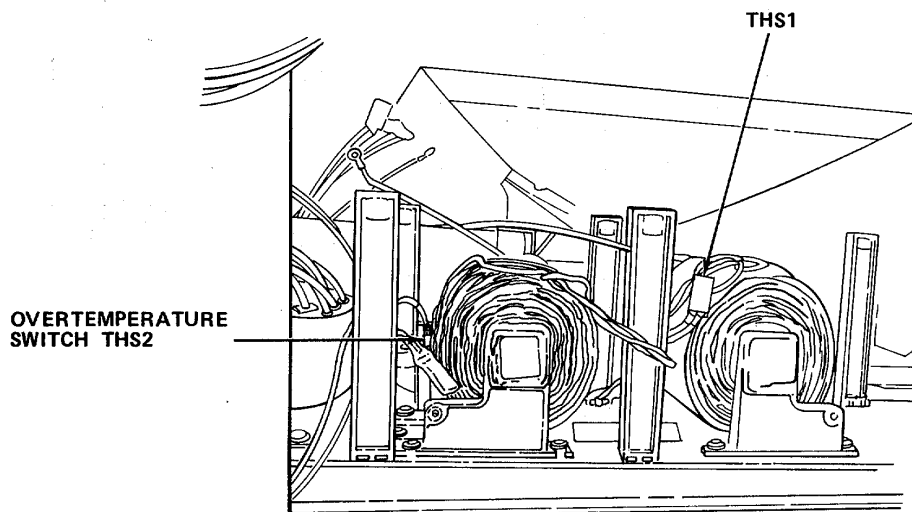
Tool Kit, Electronic Repair
Flat Tip Screwdriver
Hex Head Key Wrench Set
Slip Joint Pliers

SUPPLIES: 200°F Thermostat Switch

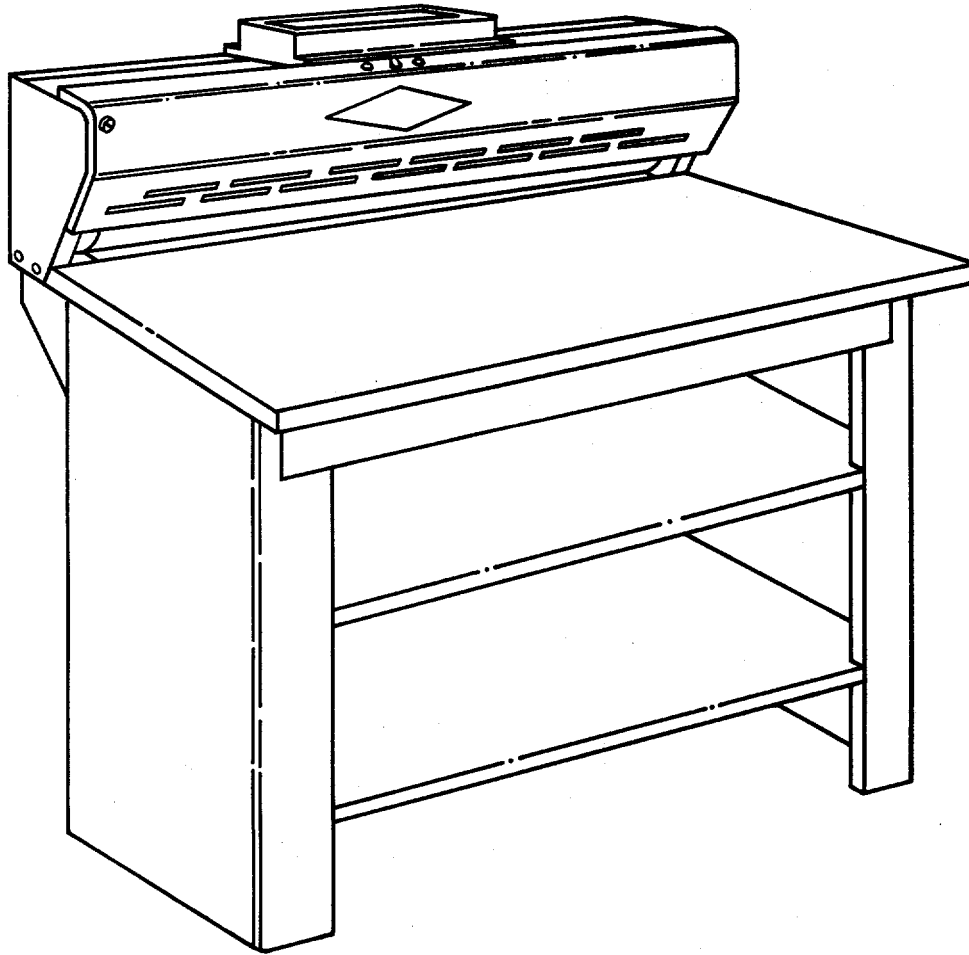
WARNING

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

- a. Perform steps a-k of paragraph 2-20.5 to remove 3kW power supply circuit board.



- b. Tag and disconnect wires for defective overtemperature switch.
c. Remove mounting bolts and defective overtemperature switch.
d. Install new overtemperature switch and mounting bolts.
e. Reconnect wires for new overtemperature switch.
f. Perform steps n-x of paragraph 2-20.5 to reinstall 3kW power supply circuit board.

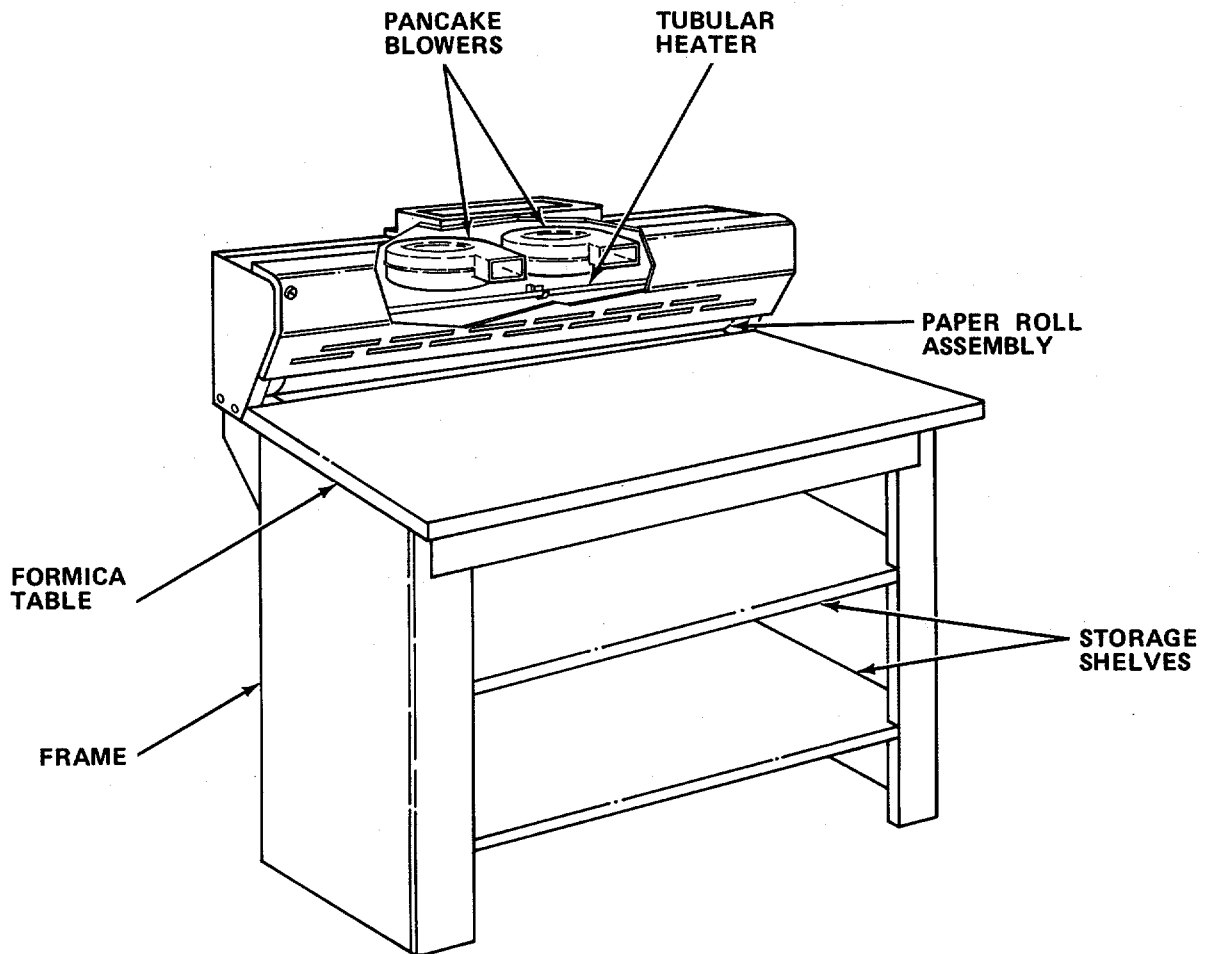


CHAPTER 3**PLATE FINISHING TABLE****Section I. INTRODUCTION****3-1. GENERAL INFORMATION.**3-1.1 Scope.

- a. Model Number and Equipment Name. Model RUB40 Plate Finishing Table.
- b. Purpose of Equipment. To provide user with a clean work surface, and a drying flow of air for developing, gumming, and finishing of presensitized and wipe on printing plates.

3-2. EQUIPMENT DESCRIPTION.3-2.1 Equipment Characteristics, Capabilities, and Features.

- a. Built-in blowers provide an even flow of air over entire table surface to speed drying.
- b. Built-in electric heater aids speed drying process.
- c. Formica top is protected by kraft paper fed from a built-in dispenser to provide a clean work surface for each plate.
- d. Sturdy, all-welded steel base and storage shelves.

3-2.2 Location and Description of Major Components.

FRAME ASSEMBLY. Supports table top, blowers and heater housing, and steel shelves.

FORMICA TABLE.. Provides a smooth working surface.

PAPER ROLL ASSEMBLY. Consists of a heavy duty kraft paper roll mounted on a dowel for ease of dispensing.

PANCAKE BLOWERS. Consist of two pancake type blowers which provide flow of air directed to table through housing.

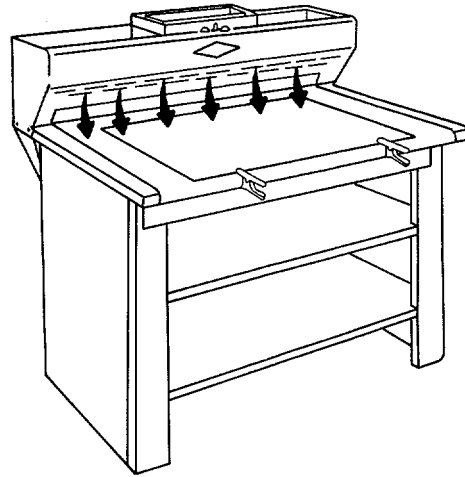
TUBULAR HEATER. Mounted lengthwise along housing to provide a heat source.

STORAGE SHELVES. Consist of two steel shelves for storage purposes.

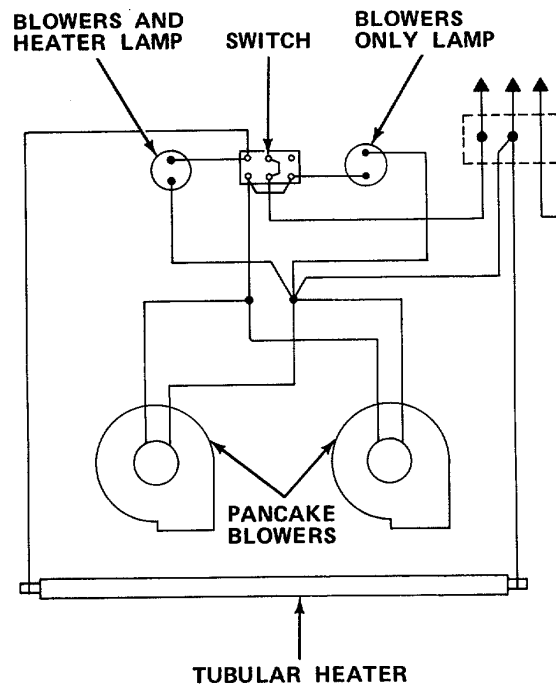
3-2.3 Equipment Data.

Power Requirements	115 V, 60 Hz, 12 Amps
Finishing Surface Working Area	28.0 in. x 40.0 in. (71.0 cm x 102.0 cm)
Dimensions	
Width	40.0 in. (102.0 cm)
Depth	34.5 in. (87.6 cm)
Height (to table top) (to housing top)	36.0 in. (91.4 cm) 51.5 in. (130.8 cm)
Blower Motors	
Power Requirements	115 V, 60 Hz, .58 Amps
Max Ambient Temperature	105°F (40.5°C)
Horsepower	1/100 Hp
Speed	1530 RPM
Tubular Heater	
Power Requirement	115 V, 60 Hz, 10.9 Amps
Power Dissipation	1250 Watts

3-3. TECHNICAL PRINCIPLES OF OPERATION.



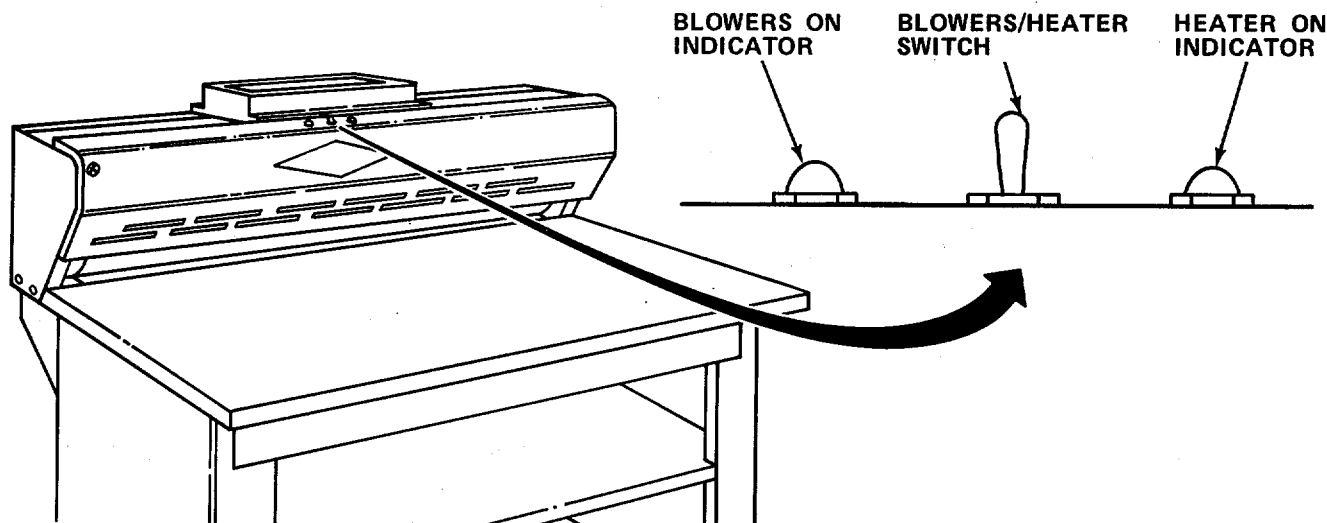
3-3.1 General. The blowers and tubular heater provide a constant flow of warm air over entire table work surface. With the use of the kraft roll paper, easy cleanup is achieved.



3-3.2 Electrical System. Provides power to the pancake blowers and the tubular heater. Control switch is a double-pole, double-throw type switch. In the center position, no power is supplied to the blowers or the tubular heater. With the switch in the blowers only position, power is sent to the blowers and to the blowers only power light. With the switch in the heater and blower position, power is provided to both the blowers and heater. All components in the electrical system use 115 V 60 Hz power.

Section II. OPERATING INSTRUCTIONS

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



CONTROL OR INDICATOR

FUNCTION

Blowers/Heater Switch

In left position, allows only the blowers to operate. In right position, allows the blowers and heater to operate.

Blowers On Indicator

When lit, indicates power is supplied to blowers.

Heater On Indicator

When lit, indicates power is supplied to heater.

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 column. 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:

<u>Item</u>	<u>Quantity</u>
Liquid Detergent (Item 16, Appendix E)	ar
Cheesecloth (Item 14, Appendix E)	ar

Table 3-1. 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 W - Weekly AN - Annually (Number) - Hundreds of Hours
 D - During M - Monthly S - Semiannually
 A - After Q - Quarterly BI - Biennially

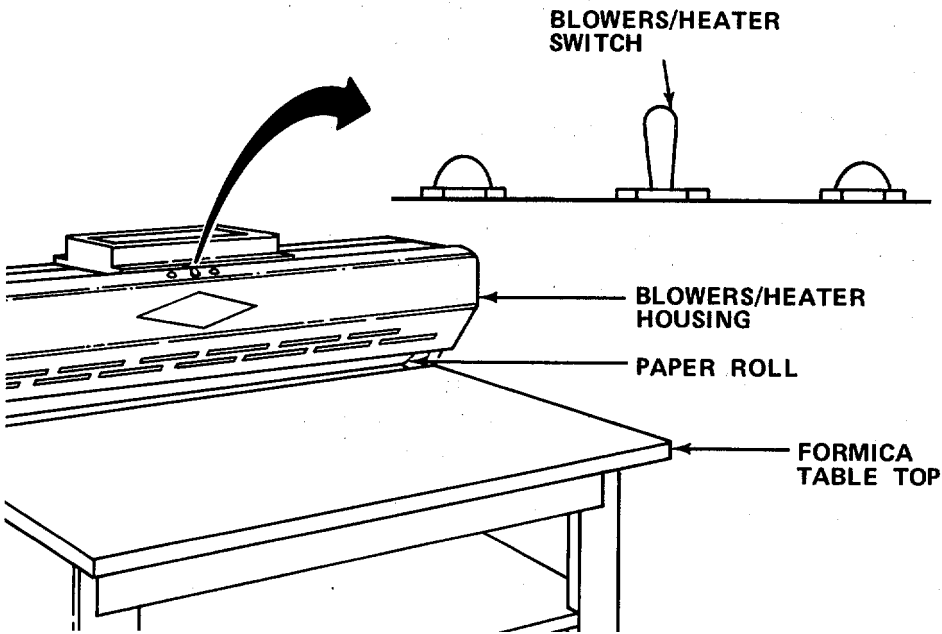
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
1	B/D	<p><u>PLATE FINISHING TABLE.</u></p> <p><u>Inspect.</u></p>  <ol style="list-style-type: none"> 1. Place blowers/heater switch to center position. 2. Inspect formica table top for cracks or deep scratches which may affect operation. 3. Inspect blowers/heater housing for dents or missing parts (bolts, screws, etc.). 4. Place blowers/heater switch to left and verify blowers turn on and no heat is produced. 	<p>Dents or missing parts.</p> <p>Blowers fail to operate and/or heat is produced.</p>

Table 3-1. 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:
1	B/D	<p><u>PLATE FINISHING TABLE-Cont</u></p> <p><u>Inspect-Cont</u></p> <p>5. Place blowers/heater switch to right and verify blowers turn on and heat is produced.</p> <p>6. Place blowers/heater switch to-center position and verify blowers and heater turn off.</p> <p>7. Inspect paper roll and verify sufficient kraft paper is available.</p>	<p>Blowers fail to operate and/or heat is not produced.</p> <p>Blowers remain on and/or heater does not turn off.</p> <p>Quantity of paper insufficient.</p>
2	B/A	<p><u>Clean.</u></p> <p style="text-align: center;"><u>WARNING</u></p> <p>Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.</p> <p>1. Place blowers/heater switch to center position.</p>	

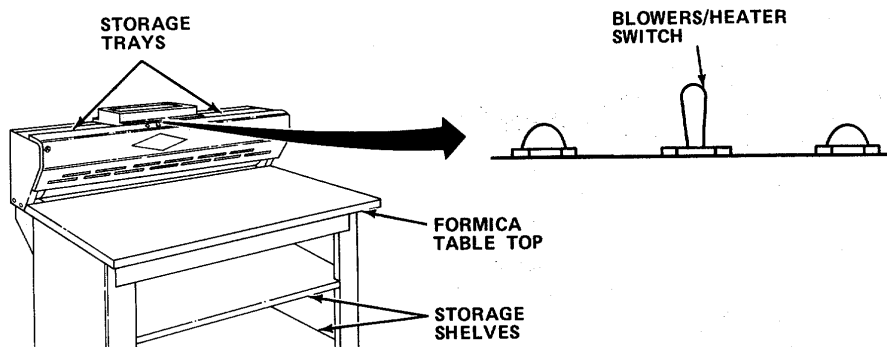


Table 3-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES-Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

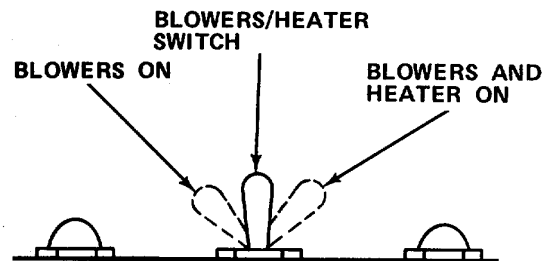
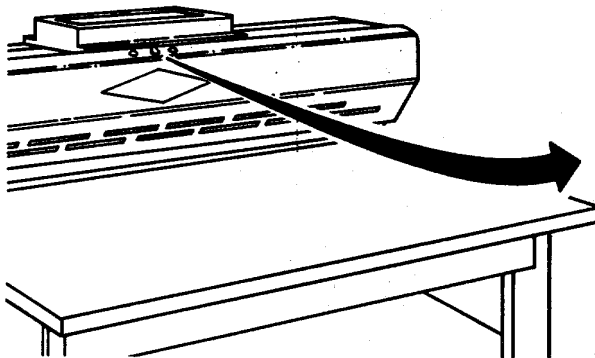
(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
2	B/A	<p><u>PLATE FINISHING TABLE -Cont</u></p> <p><u>Clean-Cont</u></p> <ol style="list-style-type: none"> 2. Unplug power cord. 3. Wipe formica table top surface with cheesecloth moistened in mild solution of detergent and water to remove all stains. 4. Wipe formica table top surface dry with cheesecloth to remove streaks and smears. 5. Wipe remaining surfaces, storage tray, blowers/heater housing, and storage shelves clean with damp cheesecloth. 6. Plug in power cord. 	

3-6. OPERATION UNDER USUAL CONDITIONS.

3-6.1 Assembly and Preparation for Use.

- a. Perform before operation PMCS.
- b. Plug in power cord.

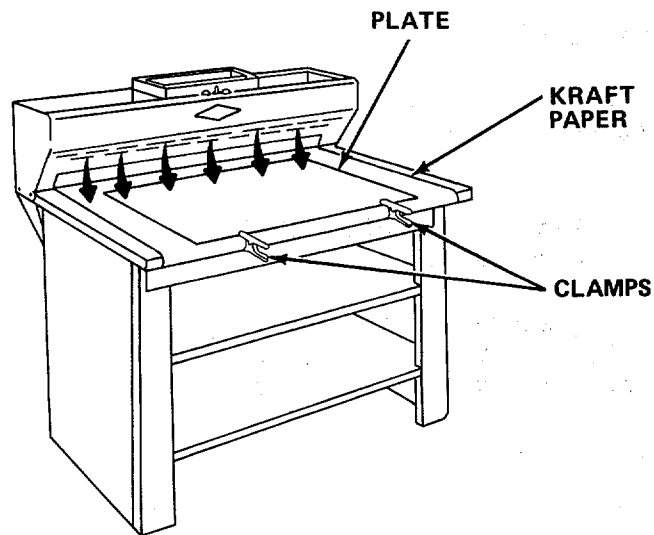


- c. Place power switch in desired operating position, either blowers on, or blowers and heater on.

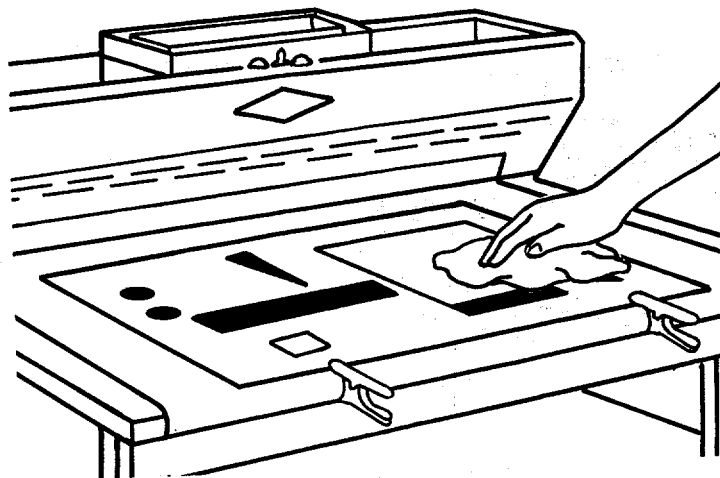
3-6.2 Operating Procedures.

NOTE

- Follow the plate manufacturer's directions for developing the specific type of plate being used.
 - The developing process is performed in the sink. Most plates need a plate developer solution applied to the plate surface.
- a. Remove the developed plate and set plate on the kraft paper.



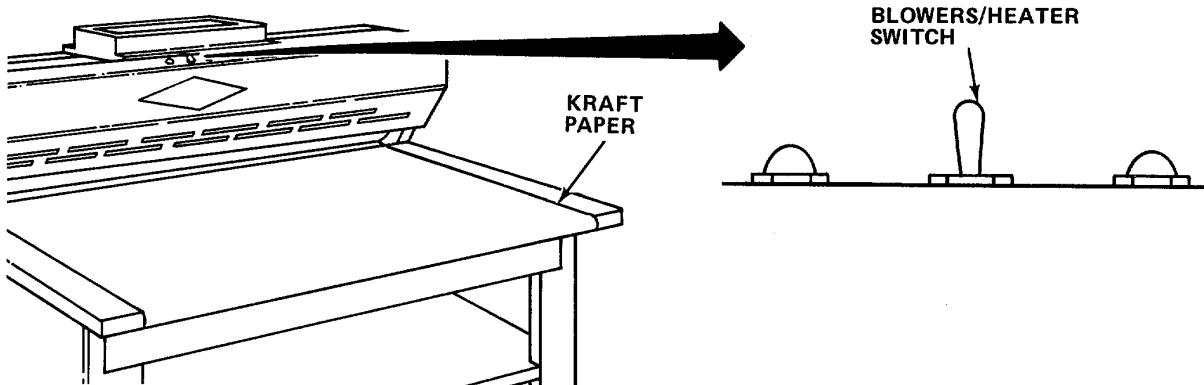
- b. Place clamps over end of formica table top so kraft paper and plate are fastened to table.
- c. Allow time for plate to dry completely before continuing.



- d. After the plate has dried, apply a small amount of special gum solution to the entire plate surface using a soft, clean cellulose sponge.
- e. Polish the gum dry with clean, soft cheesecloth.
- f. The plate is now ready for storage or the press.
- g. Clean the formica tabletop and remove kraft paper that was used during the gumming process.
- h. If more plate processing is desired, repeat steps a-g.
- i. If processing has been completed, perform your after operation PMCS (Table 3-1).

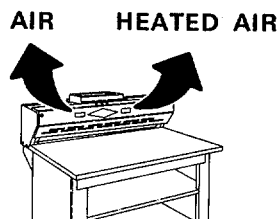
3-6.3 Preparation for Movement.

- a. Place power switch in center position.



- b. Remove and discard kraft paper from table surface.
- c. Perform after operation PMCS.
- d. Remove and store all loose items.

3-6.4 Operating Instructions on Decals and Instruction Plates.



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 the operator 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 plate finishing table, 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 3-2. TROUBLESHOOTING

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

1. PLATE FINISHING TABLE WILL NOT ENERGIZE.

Step 1. Check that power cord is plugged in.

- (a) If power cord is plugged in, proceed to step 2.
- (b) Plug in power cord.

Step 2. Check position of power panel circuit breaker.

- (a) Reset circuit breaker.
- (b) If problem persists, notify your supervisor.

3-10. MAINTENANCE PROCEDURES.

a. This section contains instructions covering operator maintenance functions for the plate finishing table. 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

PROCEDURE	PARAGRAPH
Replace Kraft Paper Roll.....	3-10.1

3-10.1 Replace Kraft Paper Roll.

MOS: 83E, Photo and Layout Specialist

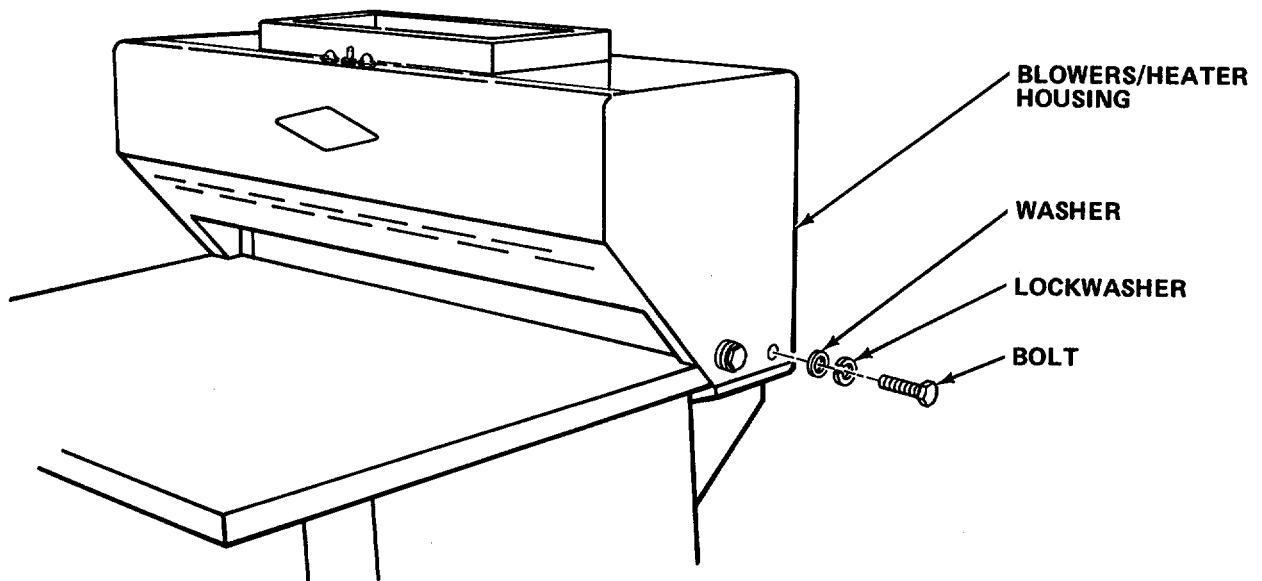
TOOLS: 9/16 in. Wrench

SUPPLIES: Kraft Paper Roll

WARNING

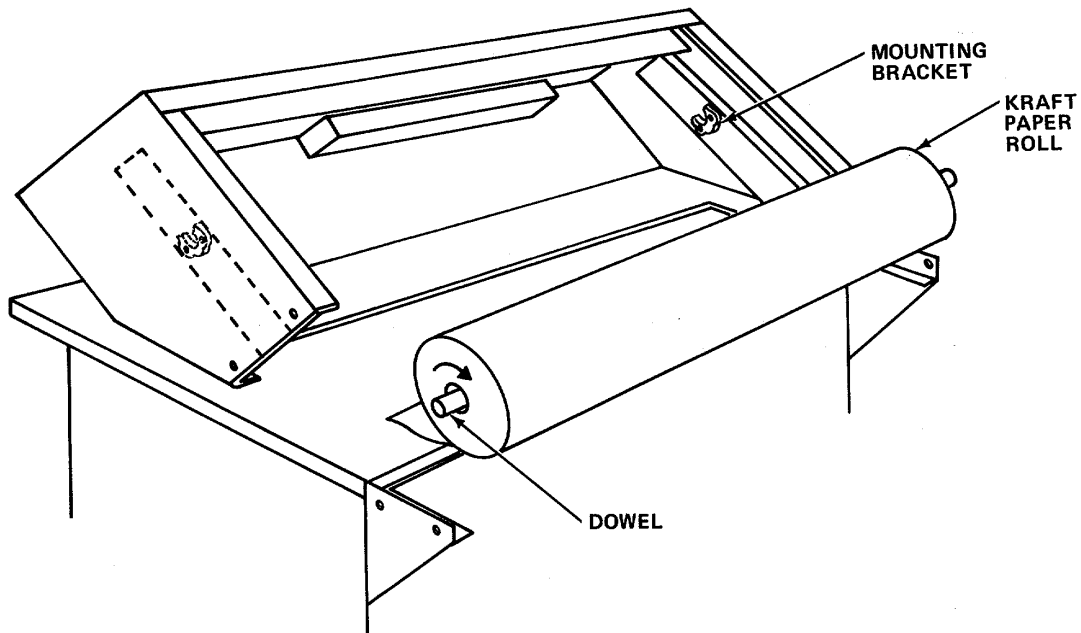
Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Unplug power cord.

**CAUTION**

Prior to removing last bolt on blowers/heater housing, hold housing in place with one hand to prevent housing from tipping over.

- b. Remove four bolts, washers, and lockwashers from blowers/heater housing.



- c. Carefully lay blowers/heater housing across formica table top.
- d. Remove old kraft paper roll and dowel from its mounting brackets.
- e. Remove dowel from old paper roll and insert through new paper roll.

NOTE

Ensure that kraft paper dispenses from bottom of roll.

- f. Install new kraft paper roll and dowel onto brackets in blowers/heater housing.
- g. Carefully lift blowers/heater housing back into place on mounting braces.
- h. Reinstall four bolts, washers, and lockwashers to reattach housing to mounting braces.
- i. Plug in power cord.

Section IV. ORGANIZATIONAL MAINTENANCE**3-11. LUBRICATION INSTRUCTIONS.****NOTE**

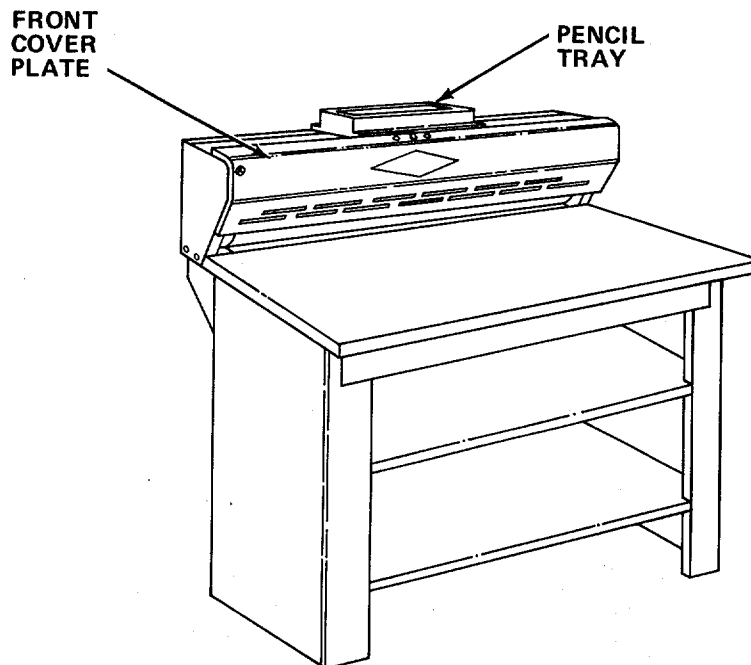
These lubrication instructions are mandatory.

3-11.1 Lubricate pancake blowers semiannually as follows:

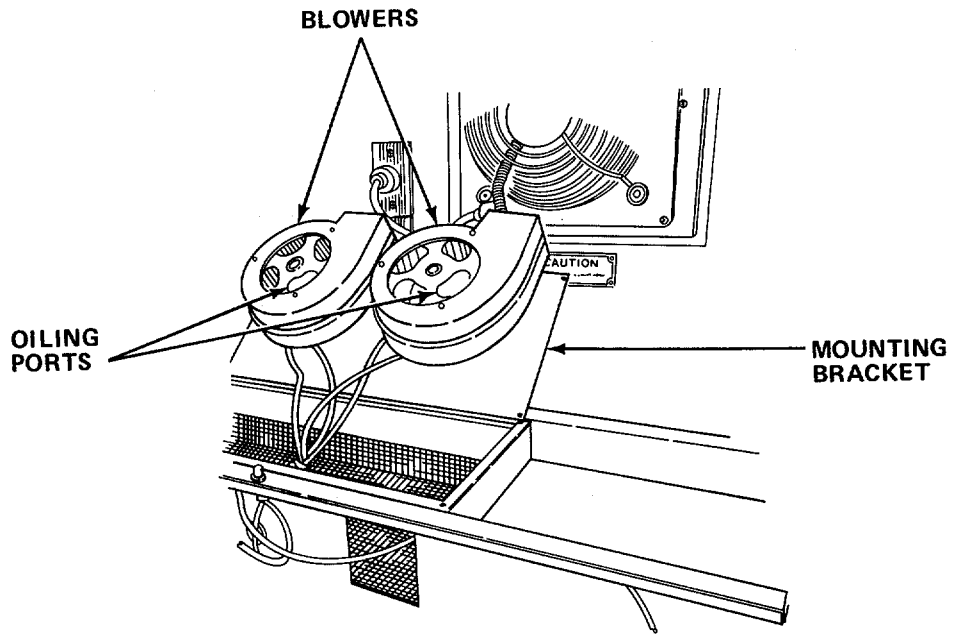
WARNING

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

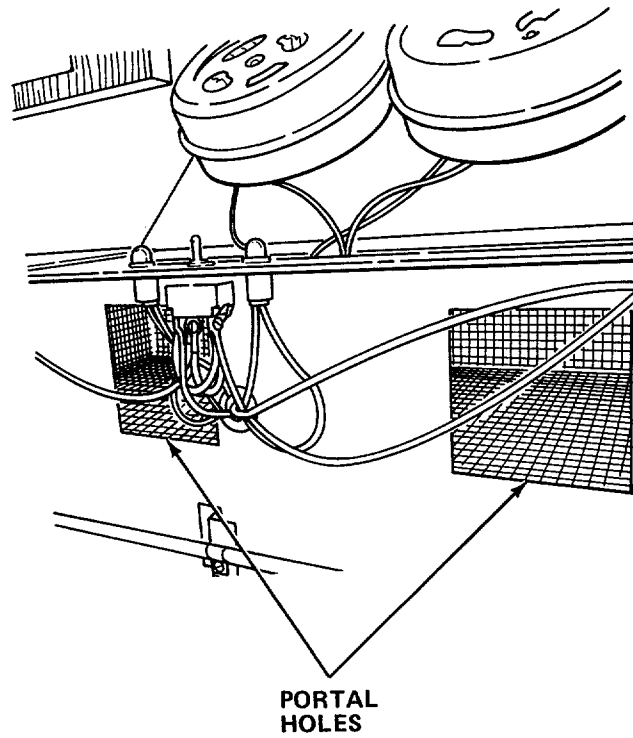
- a. Unplug power cord.



- b. Remove fourteen screws attaching front cover plate and remove plate.
- c. Remove six screws attaching pencil tray to blowers/heater housing and remove tray.



- d. Carefully lift motor mounting bracket clear of housing and set to one side.
- e. Locate oiling ports for motors and apply two drops of SAE 20 oil (Item 33, Appendix E) into each port.



- f. Carefully reinstall blowers and blower mounting plate so that blowers' exhausts fit through portal holes of frame. Aline all screw holes on top.
- g. Reinstall six screws and pencil tray to blowers/heater housing.
- h. Reinstall fourteen screws and front cover plate to housing.
- i. Plug in power cord.
- j. Place blowers/heater switch to left and allow blowers to run for one minute.
- k. Place blowers/heater switch to center position.
- l. Unplug power cord.

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

3-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

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 5-3610-285-24P covering organizational maintenance for this equipment.

3-13. SERVICE UPON RECEIPT.

3-13.1 Check 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.

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.

c. Interval column. 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:

<u>Item</u>	<u>Quantity</u>
Vacuum Cleaner	1 ea

Table 3-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

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
1	M	<p><u>PLATE FINISHING TABLE.</u></p> <p><u>Service Blowers/Heater Housing.</u></p> <p style="text-align: center;"><u>WARNING</u></p> <p>Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.</p> <p>1. Unplug power cord.</p>

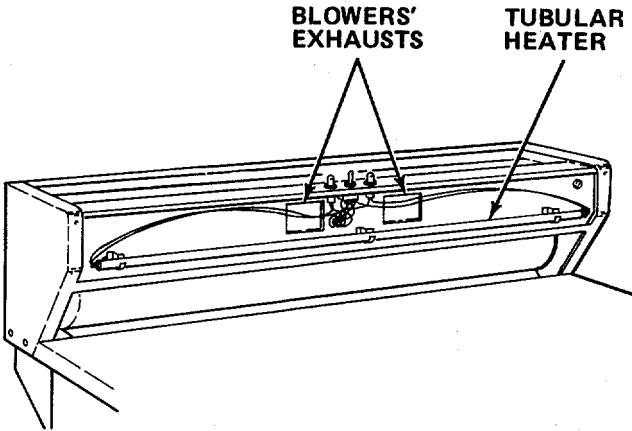
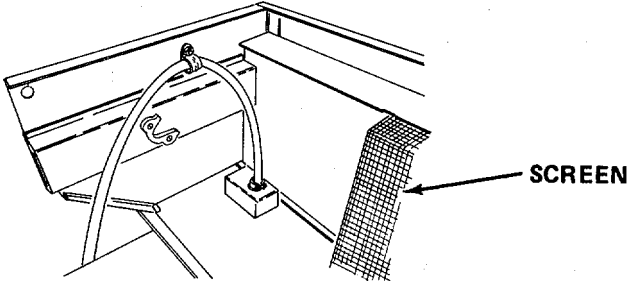
Table 3-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES-Cont

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
1	M	<p><u>PLATE FINISHING TABLE-Cont</u></p> <p><u>Service Blowers/Heater Housing-Cont</u></p>  <ol style="list-style-type: none"> 2. Remove blowers/heater housing front panel. 3. Using a vacuum cleaner, carefully vacuum areas around tubular heater and blowers' exhausts.  <ol style="list-style-type: none"> 4. Using vacuum cleaner, vacuum screening under blowers. 5. Reinstall blowers/heater housing front panel. 6. Plug in power cord.

3-15. 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 is not corrected by a listed corrective action, notify your supervisor.

c. For unidentified malfunctions, use the following schematic for further fault analysis.

d. If the plate finishing table 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 troubleshooting. Perform no-power troubleshooting procedures for dead receptacle (Table 1-4).

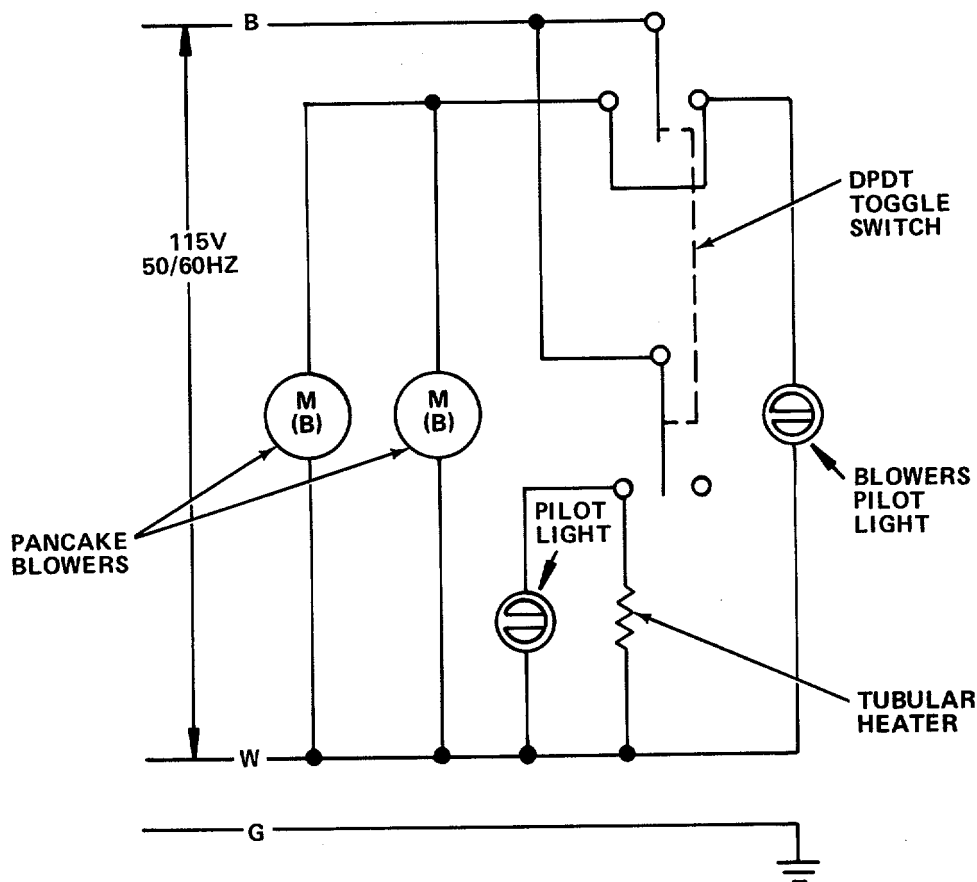


Table 3-4. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

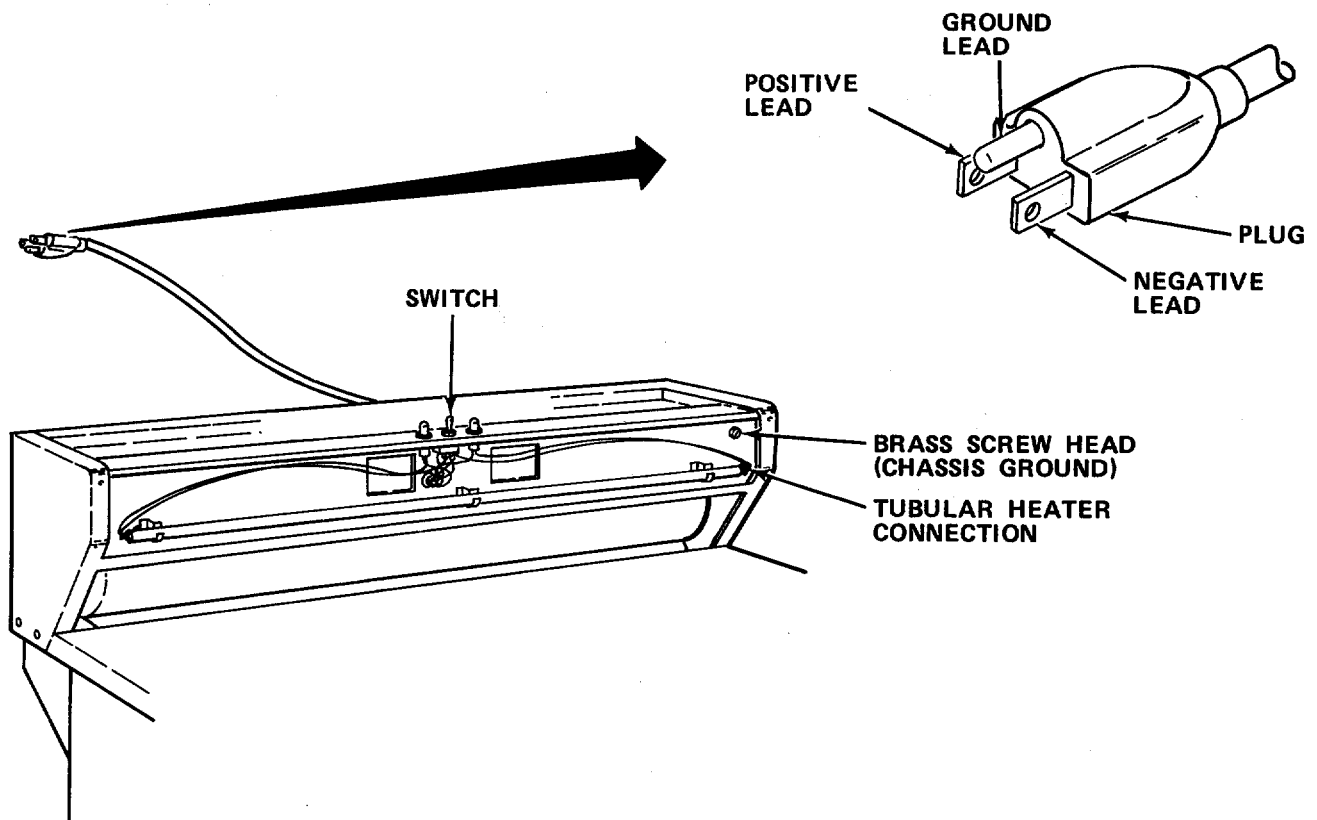
1. PLATE FINISHING TABLE WILL NOT ENERGIZE.

Step 1. Check continuity of power cord as follows:

WARNING

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

- (a) Unplug power cord.
- (b) Remove blowers/heater housing front panel.



- (c) Check between positive lead of plug and center post on switch for zero ohms resistance.

Table 3-4. ORGANIZATIONAL TROUBLESHOOTING-Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

1. PLATE FINISHING TABLE WILL NOT ENERGIZE-Cont

(d) Check between negative lead of plug and right side of tubular heater for zero ohms resistance.

(e) Check between ground lead of plug and brass screwhead (chassis ground) next to input wires, for zero ohms resistance.

(1) If all checks are correct, proceed to step 2.

(2) If any check is not correct, replace power cord (paragraph 3-16.5).

Step 2. Check continuity of blowers/heater switch.

(a) If continuity is incorrect, replace blowers/heater switch (paragraph 3-16.1).

(b) If continuity is correct, refer to electrical diagram and troubleshoot.

2. BLOWERS OPERATE BUT NO HEAT IS PRODUCED.

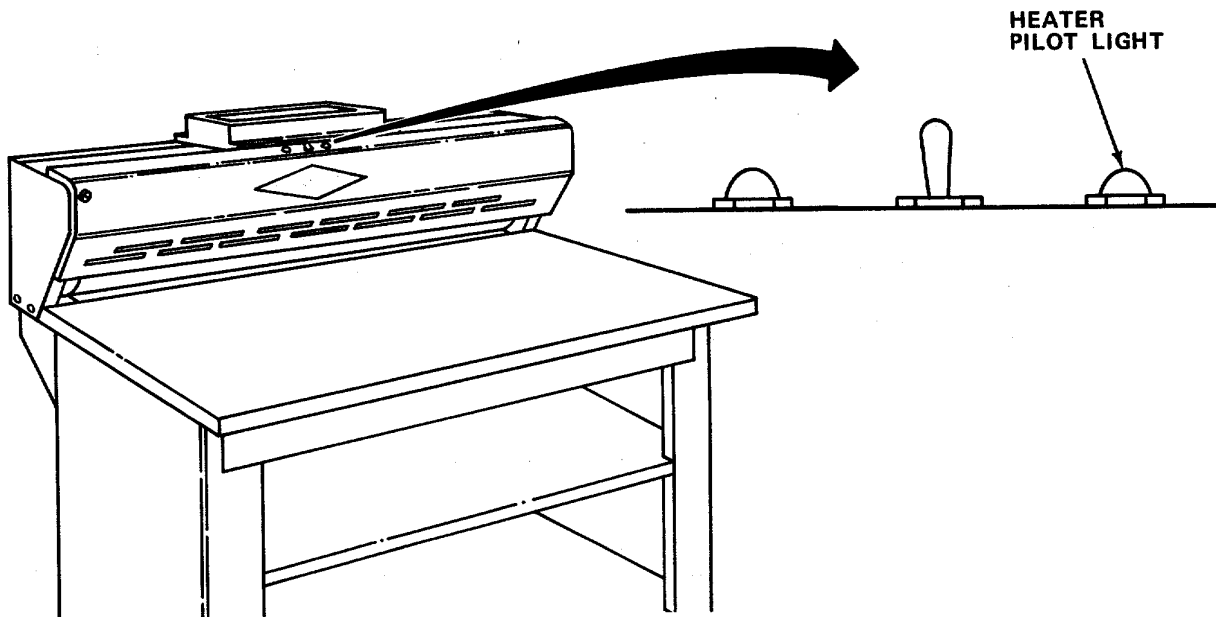


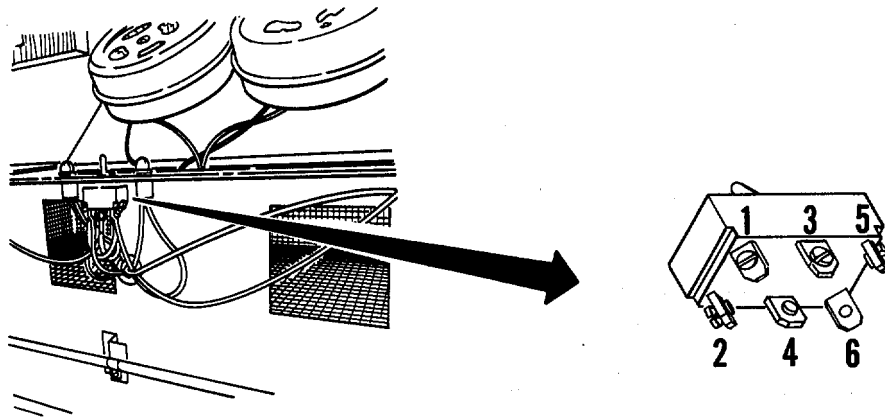
Table 3-4. ORGANIZATIONAL TROUBLESHOOTING-Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

2. BLOWERS OPERATE BUT NO HEAT IS PRODUCED-Cont

Step 1. Check that pilot light for heater is on.

- (a) If light is off, proceed to step 2.
- (b) If light is on, replace tubular heater (paragraph 3-16.13).



Step 2. With blowers/heater switch positioned to the right, check continuity between contacts 4 and 2.

- (a) If continuity is incorrect, replace blowers/heater switch (paragraph 3-16.1).
- (b) If continuity is correct, refer to electrical diagram and troubleshoot.

3. ONE OR BOTH BLOWERS ARE INOPERATIVE.

Visually check blowers.

- (a) If both blowers are inoperative, replace blowers/heater switch (paragraph 3-16.1).
- (b) If only one blower is inoperative, replace blower (paragraph 3-16.4).

3-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the plate finishing table. 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

PROCEDURES	PARAGRAPH
Replace Blowers/Heater Switch.....	3-16.1
Replace Pilot Light(s).....	3-16.2
Replace Tubular Heater	3-16.3
Replace Pancake Blower(s)	3-16.4
Replace Power Cord	3-16.5
Remove/Install Plate Finishing Table	3-16.6

3-16.1 Replace Blowers/Heater Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

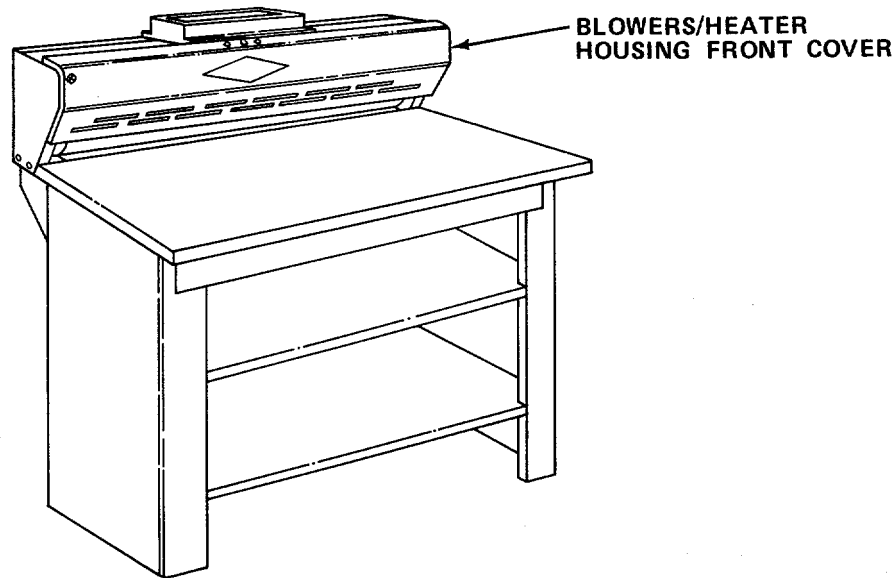
- Tool Kit, Light Machine Repair
- Flat Tip Screwdriver
- Pliers

SUPPLIES: Switch

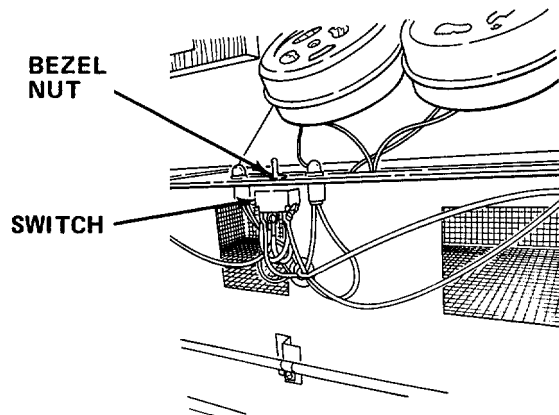
WARNING

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

- a. Unplug power cord.



- b. Remove fourteen screws and blowers/heater housing front cover panel.



- c. Remove bezel nut on top of blowers/heater switch and remove switch from blowers/heater housing frame.
- d. Tag and disconnect nine wires from switch and remove defective switch.
- e. Reconnect nine wires to new switch.
- f. Install new blowers/heater switch into blowers/heater housing frame and attach with bezel nut.
- g. Reinstall blowers/heater housing front cover panel.
- h. Plug in power cord.

3-16.2 Replace Pilot Light(s).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

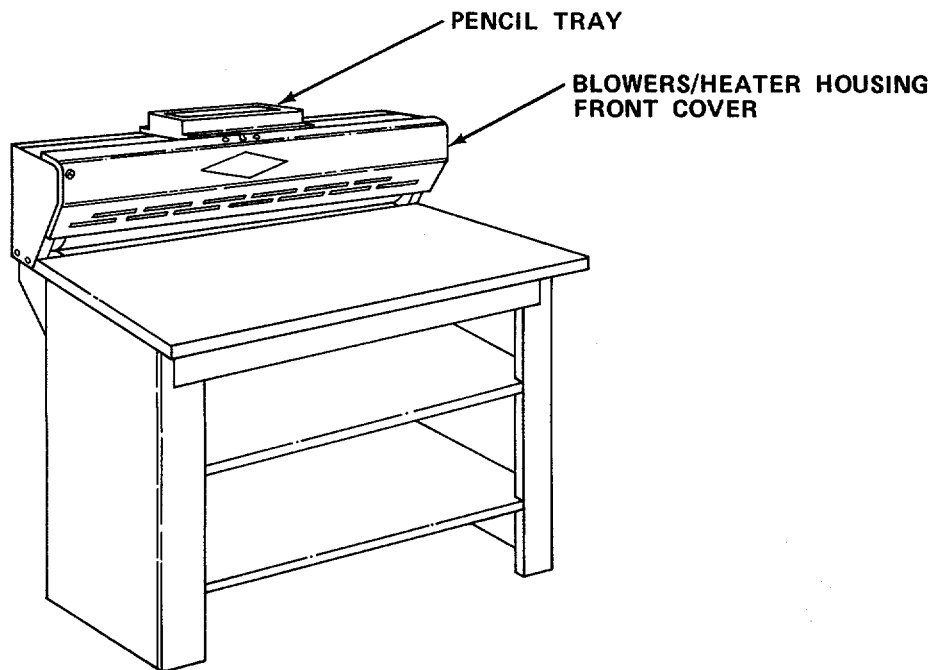
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Pliers

SUPPLIES: Pilot Light(s)
Electrical Tape (Item 59, Appendix E)

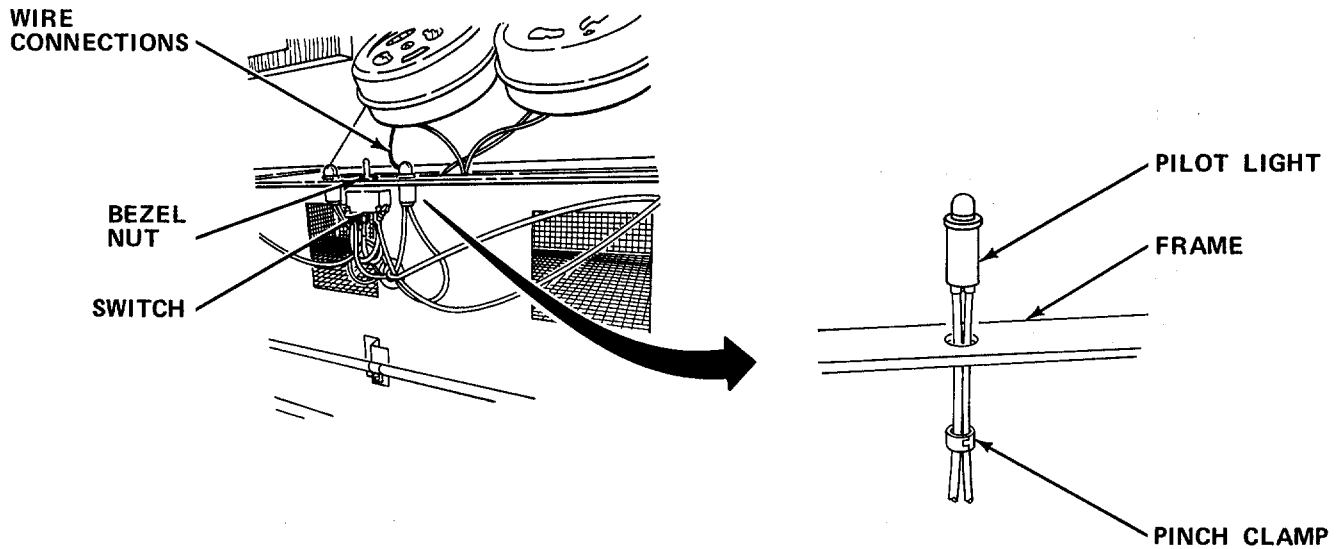
WARNING

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

- a. Unplug power cord.



- b. Remove fourteen screws and blowers/heater housing front cover panel.
- c. Remove six screws and pencil tray.



- d. Carefully lift blowers mounting plate aside to gain access to wire connections under blowers.
- e. Remove bezel nut on top of blowers/heater switch and remove switch from blowers/heater housing frame.
- f. Tag and disconnect wire(s) from switch leading to defective light(s).
- g. Remove tape from bolt connector under blowers and tag and disconnect wire(s) leading to defective light(s).
- h. Remove pinch clamp on defective light(s) and remove light through top of frame.
- i. Install new light(s) through top of frame and hold in place with pinch clamp.
- j. Reconnect wire(s) using bolt connector under blowers, and retape bolt connector.
- k. Reconnect wire(s) to blowers/heater switch.
- l. Reinstall blowers/heater switch into frame and attach with bezel nut.
- m. Carefully reinstall blowers and blower mounting plate so that blowers' exhausts fit through portal holes of frame, and screw holes on top align.
- n. Reinstall pencil tray.
- o. Reinstall blowers/heater housing front cover panel.
- p. Plug in power cord.

3-16.3 Replace Tubular Heater.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

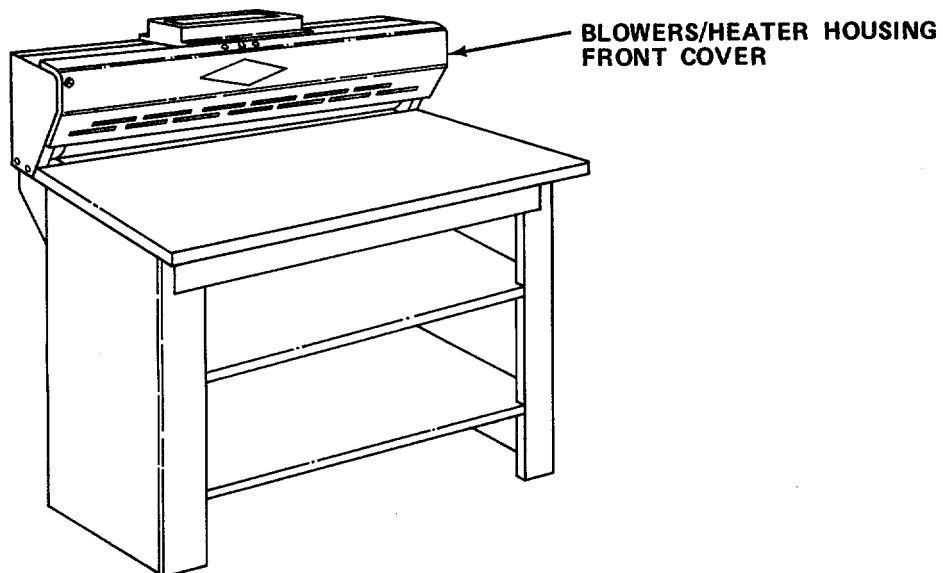
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Pliers
5/16 in. Combination Wrench

SUPPLIES: Tubular Heater

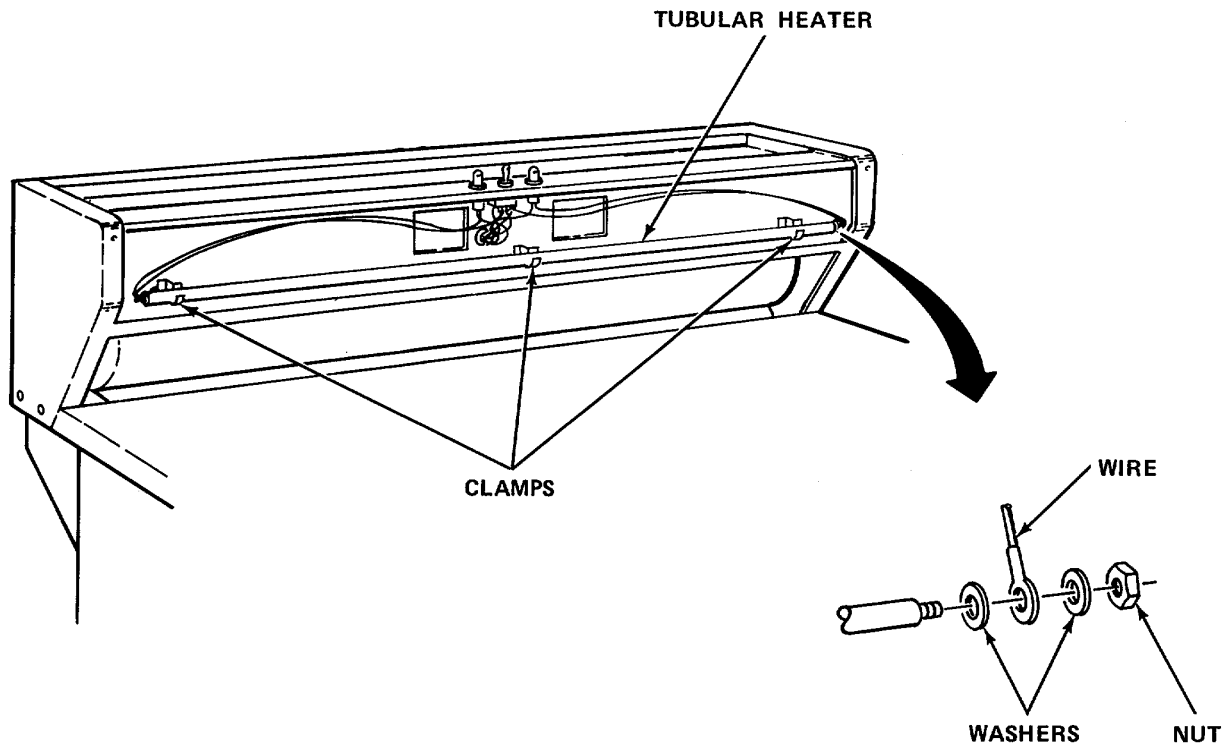
WARNING

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

- a. Unplug power cord.



- b. Remove fourteen screws and blowers/heater housing front cover panel.



- c. Tag and disconnect wires from both ends of tubular heater.
- d. Loosen three clamps holding tubular heater in place and remove defective tubular heater.
- e. Install and center new tubular heater into housing, and tighten clamps.

CAUTION

Do not overtighten nuts holding wires in place or tubular heater may be damaged.

- f. Reinstall wires to ends of tubular heater. Be sure that a washer is on either side of wire connector.
- g. Reinstall blowers/heater housing front cover panel.
- h. Plug in power cord.

3-16.4 Replace Pancake Blower(s).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

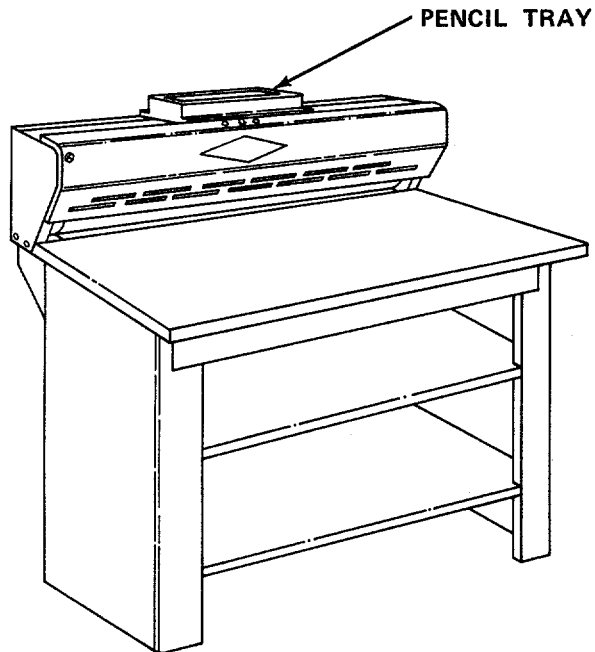
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
7/16 in. Combination Wrench
Pliers

SUPPLIES: Pancake Blower(s)
Electrical Tape (Item 59, Appendix E)

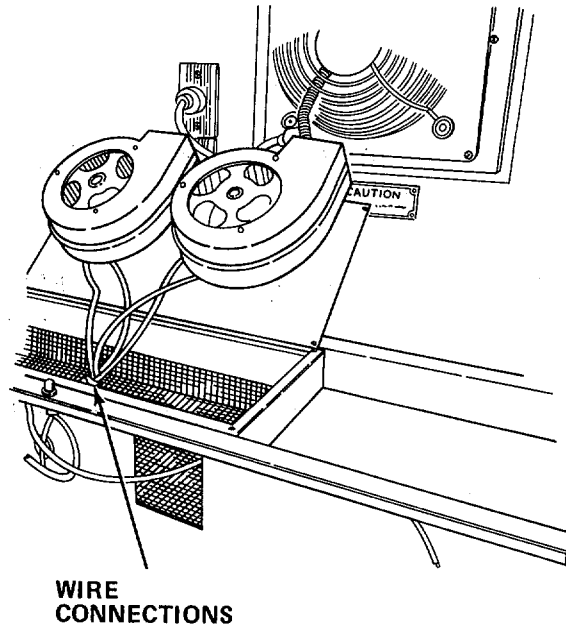
WARNING

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

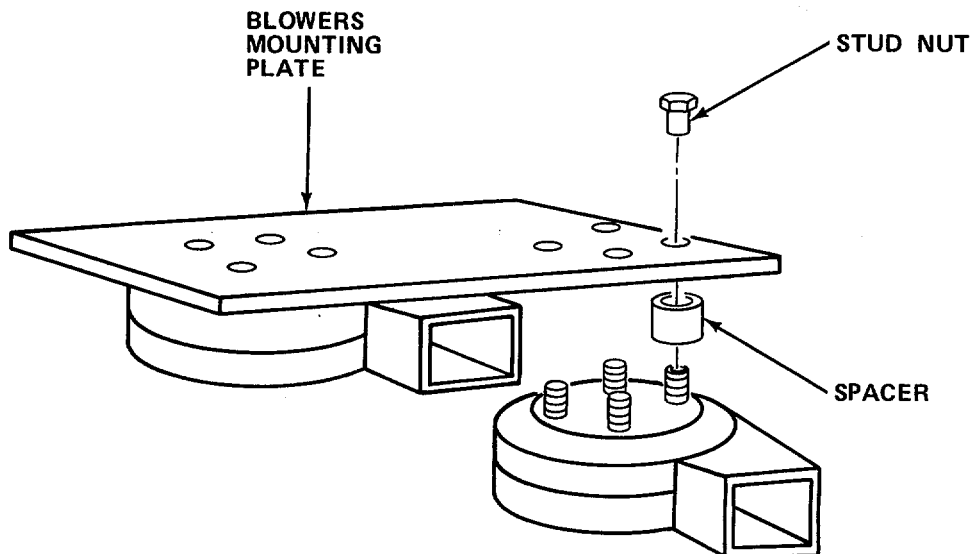
- a. Unplug power cord.



- b. Remove six screws and pencil tray.
- c. Carefully lift blowers mounting plate aside to gain access to wire connections under blowers.



- d. Remove tape from bolt connectors under blowers and tag and disconnect wires from defective blower(s).
- e. Remove four mounting nuts attaching blower(s) to mounting plate.



- f. Carefully remove defective blower(s) from mounting plate; then remove four spacers.
- g. Ensure that four spacers are installed over stud posts; then carefully install new blower(s) onto mounting plate.

- h. Reconnect wires using bolt connectors under blowers, and retape bolt connectors.

NOTE

It may be necessary to remove blowers/heater housing front cover plate to properly align blowers' exhausts.

- i. Carefully reinstall blowers and blowers mounting plate so that blowers' exhausts fit through portal holes of frame, and screw holes on top align.
- j. Reinstall pencil tray and blowers/heater housing front cover panel if removed.
- k. Plug in power cord.

3-16.5 Replace Power Cord.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

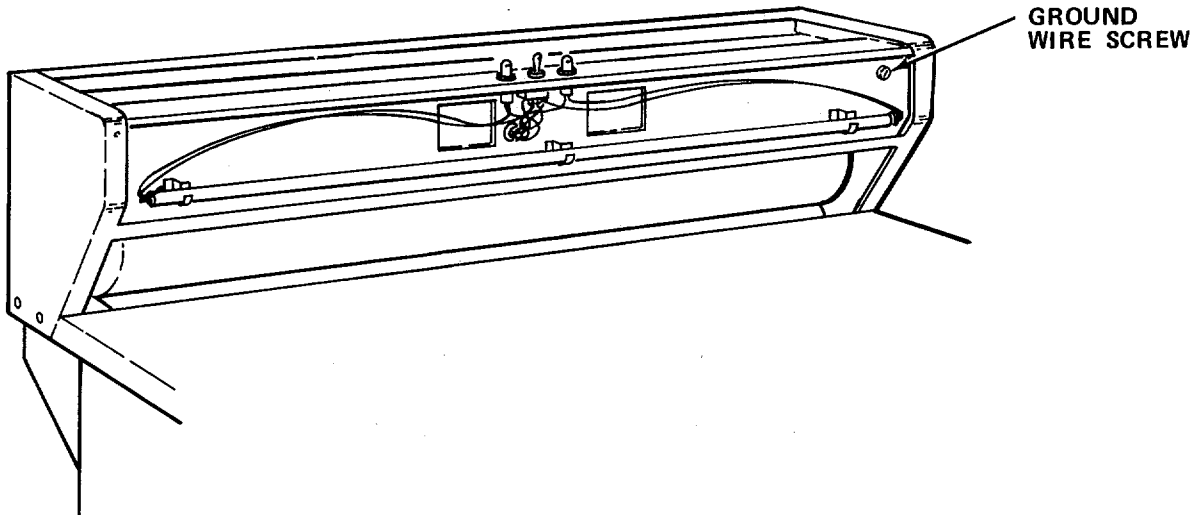
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
7/16 in. Combination Wrench

SUPPLIES: Power Cord
Electrical Tape (Item 59, Appendix E)

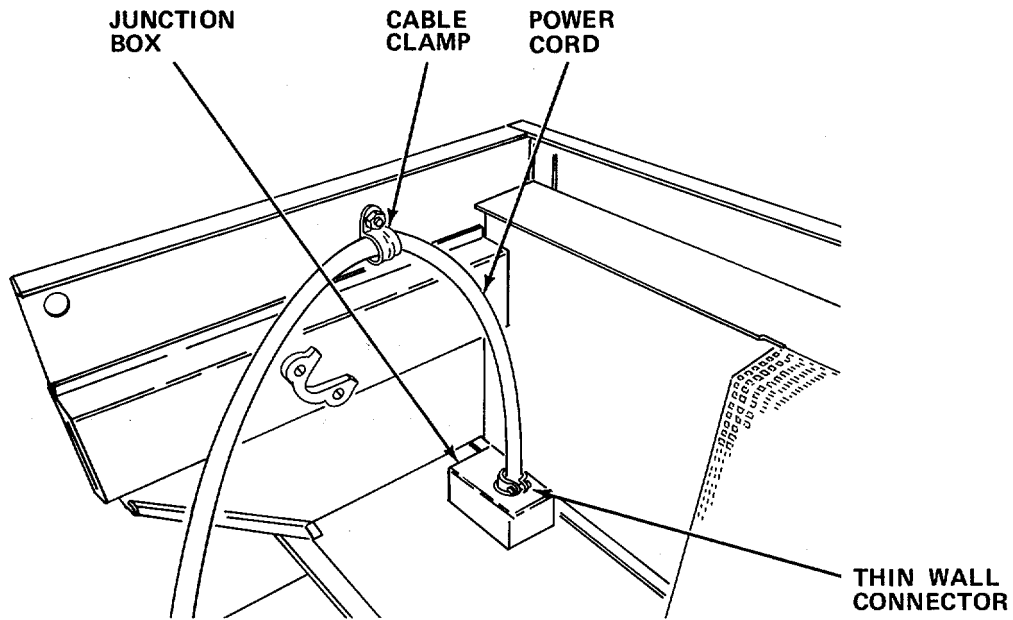
WARNING

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

- a. Unplug power cord.



- b. Remove fourteen screws and blowers/heater housing front cover panel.



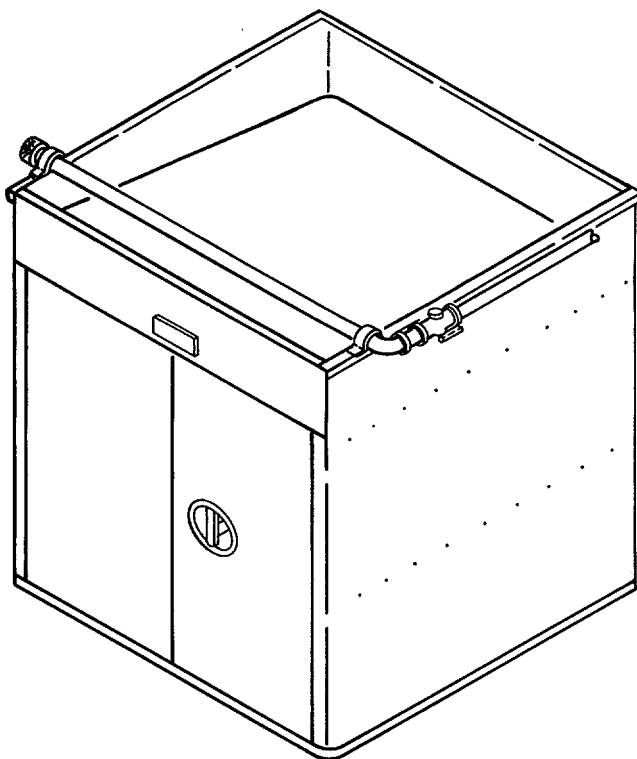
- c. Remove cable clamp for power cord.
- d. Loosen top screw and remove bottom screw of power cable junction box; then remove box.
- e. Remove thin wall cable clamp from junction box.
- f. Tag and disconnect chassis ground wire.

- g. Remove tape from bolt connectors; then tag and disconnect defective power cord wires.
- h. Pull defective power cord from junction box.
- i. Install new power cord into junction box and, using thin wall cable clamp, attach power cord to junction box.
- j. Connect wires to bolt connectors and retape connectors.
- k. Connect chassis ground wire.
- l. Reinstall junction box.
- m. Reinstall power cord cable clamp.
- n. Reinstall blowers/heater housing front cover panel.
- o. Plug in power cord.

3-17. 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 4
SINK
Section I INTRODUCTION

4-1. GENERAL INFORMATION.

4-1.1 Scope.

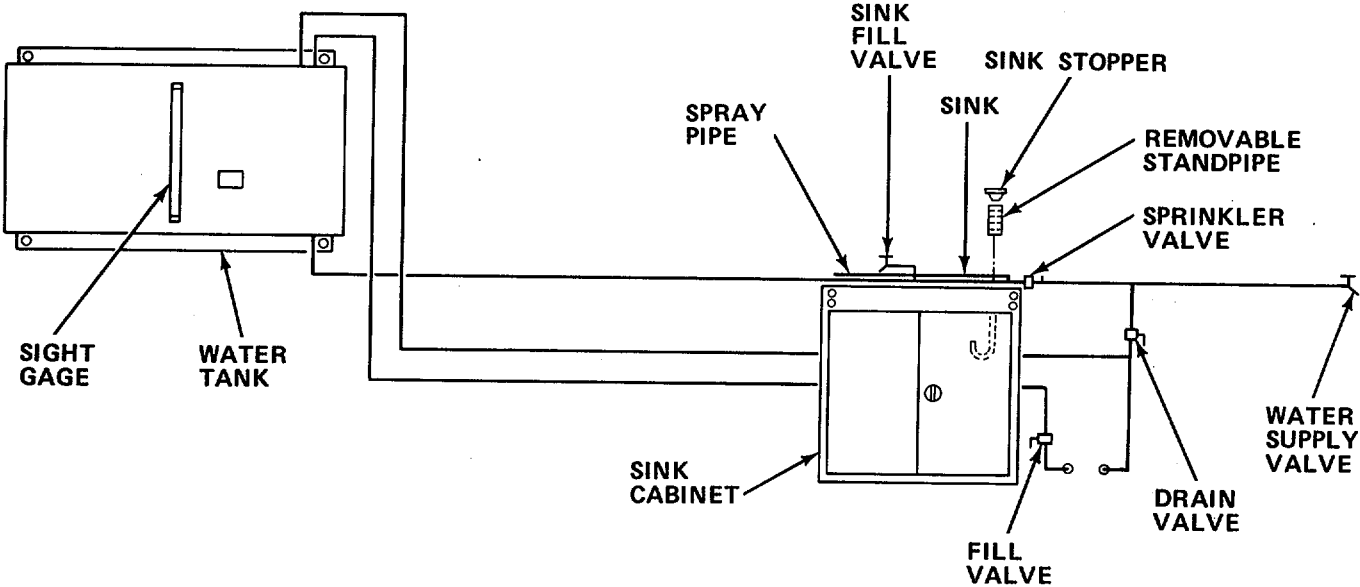
- a. Model Number and Equipment Name. Sink.
- b. Purpose of Equipment. To provide a work station for developing and washing lithographic plates.

4-2. EQUIPMENT DESCRIPTION.

4-2.1 Equipment Characteristics. Capabilities, and Features.

- a. Used in the process of developing and rinsing lithographic plates, color proofs, and deep etched peels.
- b. Provides safe location for use of chemical solutions.
- c. Built-in water spray for even rinsing.
- d. Standpipe drain system allows flowing water at a preset depth.
- e. Convenient storage area under sink.

4-2.2 Location and Description of Major Components.



REMOVABLE STANDPIPE. Allows flowing water at preset depth.

SINK FILL VALVE. Allows sink to be filled from water tank.

SPRINKLER VALVE. Controls water supply to spray pipe.

SPRAY PIPE. Delivers an even spray across width of sink.

SINK CABINET. Provides storage under sink.

WATER TANK. Stores water for use with sink and darkroom replenishment tanks.

WATER TANK SIGHT GAGE. Indicates tank water level.

4-2.3 Equipment Data.

Sink

Dimensions (Exterior)

Length	34.5 in. (87.6 cm)
Width	36.25 in. (92.0 cm)
Height	57.0 in. (144.8 cm)

Dimensions (Interior)

Length	32 in. (81.3 cm)
Width	33.9 in. (86.1 cm)
Depth	5.75 in. (14.6 cm)

Water Tank

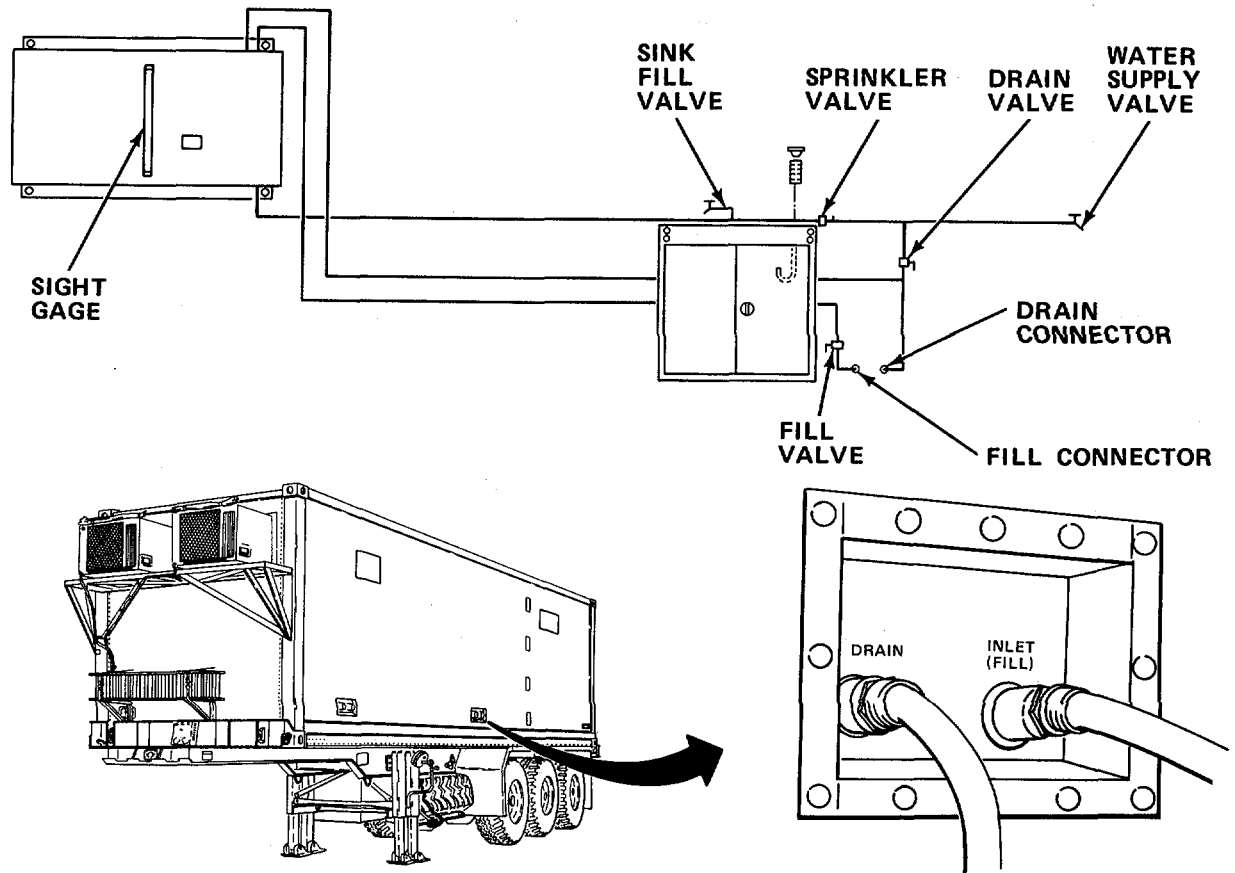
Dimensions

Length	42.0 in. (106.7 cm)
Width	7.5 in. (19.0 cm)
Height	24.0 in. (61.0 cm)
Capacity	30.0 gal. (113.6 l)

4-3. TECHNICAL PRINCIPLES OF OPERATION . There are no specific principles of operation for this equipment.

Section II OPERATING INSTRUCTIONS

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



Control or Indicator	Function
FILL Connector	Connection point for external water supply.
FILL Valve	Isolates fill connector from water storage tank.
DRAIN Connector	Connection point for external drain line.
DRAIN Valve	Isolates water storage tank from drain.
SIGHT Gage	Indicates water level in tank.
SINK FILL Valve	Controls filling of sink from water tank.

Control or Indicator	Function
SPRINKLER Valve	Controls spray volume.
WATER SUPPLY Valve	Used with film processor system.

4-5. 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 the proper equipment. Report any deficiencies using the proper forms. See DA Pam 738-750.

4-5.1 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 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. Leakage definitions for operator PMCS shall be classified as follows:

Class I	Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
Class II	Leakage of fluid great enough to form drops but not enough to cause drops to drip from the item being checked/inspected.
Class III	Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

CAUTION

- Equipment operation is allowable with minor leakages (Class I or II). Of course, you must consider the fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor.
- When operating with Class I or Class II leaks, continue to check fluid levels as required in your PMCS.
- Class III leaks should be reported to your supervisor or organizational maintenance.

g. 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.

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

i. 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.

j. 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.

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 the complete checks and services when the equipment can be shut down.

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

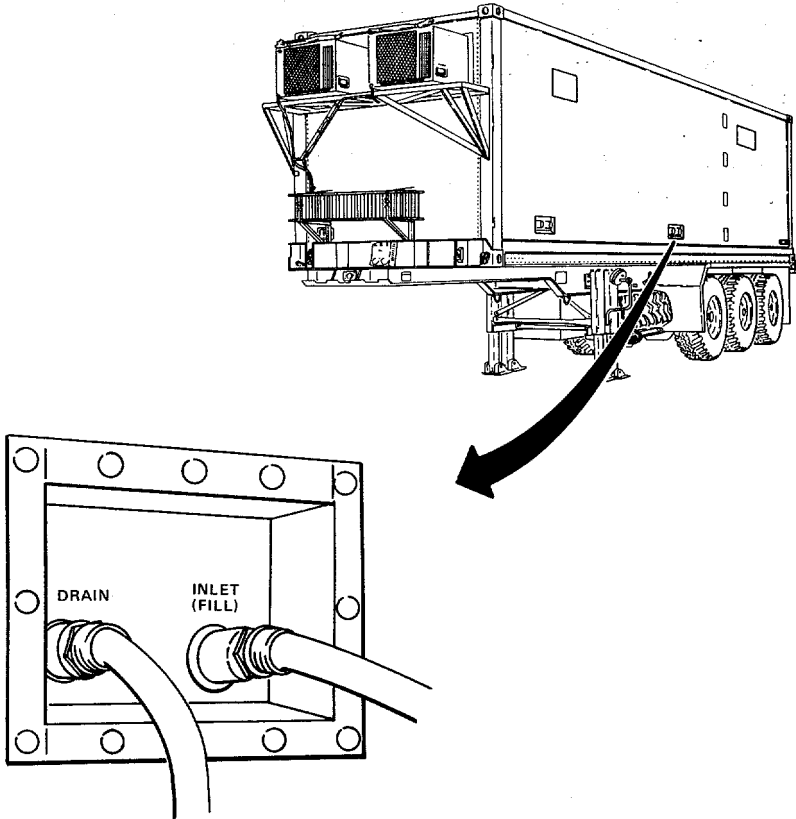
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
SINK 1	B	<p><u>Service Water Tank</u></p>  <p>1. Connect water supply line to fill connector.</p>	

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
 BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
1	B	<p><u>SINK - Cont</u></p> <p><u>Service Water Tank - Cont</u></p> <p style="text-align: center;">NOTE</p> <p>Prior to disposal of sink contents, field users should contact their local environmental coordinator, or their industrial hygienist for instructions on disposal of chemicals.</p> <ol style="list-style-type: none"> 2. Connect hose to drain connector. 3. Turn on water supply. 	

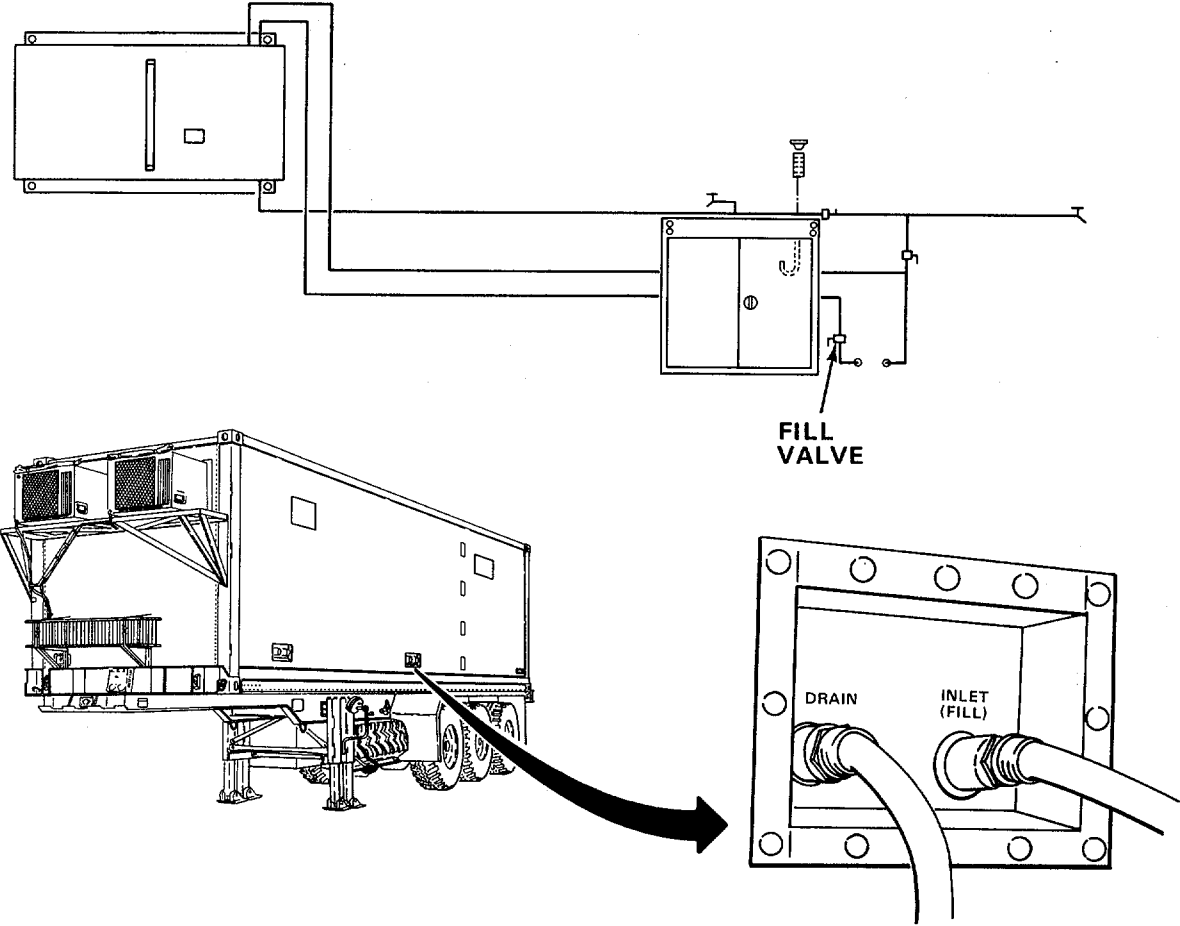


Table 2-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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:
1	B	<p><u>SINK - Cont</u></p> <p>Service Water Tank - Cont</p> <p>5. Close fill valve when water level in sight gage is within 1 in. of tank top.</p> <p>6. Turn off water supply.</p> <p style="text-align: center;">NOTE</p> <ul style="list-style-type: none"> • When filling storage tank, if drain connector is capped, sink will fill when tank overflows, regardless of position of drain valve. • External fill line is used as a vent when tank is in use. Reinstalling cap on fill connector will restrict water flow from tank. <p>7. Disconnect external water supply line. Do not reinstall cap.</p> <p style="text-align: center;">NOTE</p> <p>When fill valve is first opened to allow tank to vent, some fresh water may drain out.</p> <p>8. Open fill valve.</p>	
2	W	<p><u>Inspect Water Tank</u></p> <p>1. Inspect pipe fittings and valves for leakage.</p> <p>2. Inspect sight gage for breaks or cracks.</p> <p>3. Inspect drain and fill connectors for missing caps or defective threads.</p>	<p>Leaks cannot be stopped.</p> <p>Breaks or cracks in sight gage.</p> <p>Threads defective.</p>

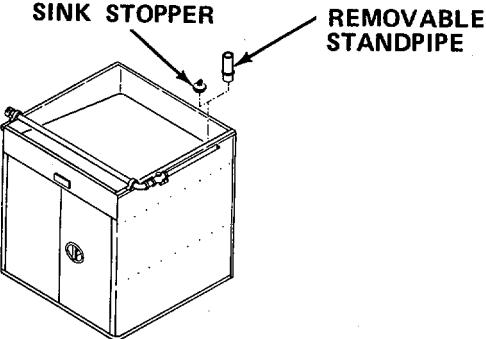
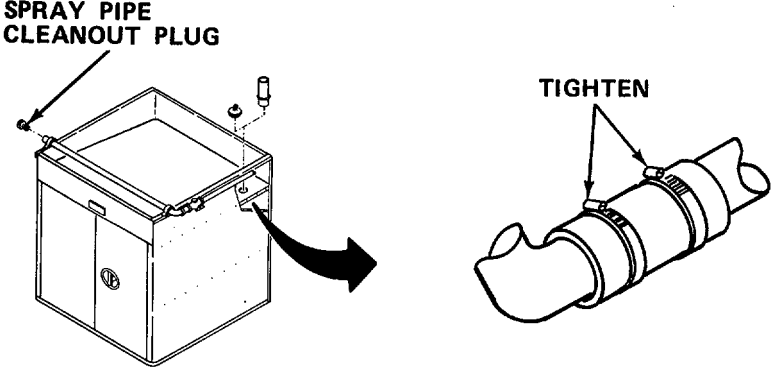
Table 2-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
3	W	<p><u>SINK - Cont</u></p> <p><u>Inspect Sink</u></p> <p>1. Inspect pipe fittings and valves for leakage.</p>  <p>2. Inspect standpipe and stopper for cracks or breaks.</p>  <p>3. Inspect drain fittings for leaking, loose, or missing fittings.</p> <p>4. Inspect spray pipe for proper water flow. Clean spray pipe.</p>	<p>Leaks cannot be stopped.</p> <p>Standpipe or stopper missing, cracked, or broken.</p> <p>Leaking or missing fittings.</p> <p>Improper water flow.</p>

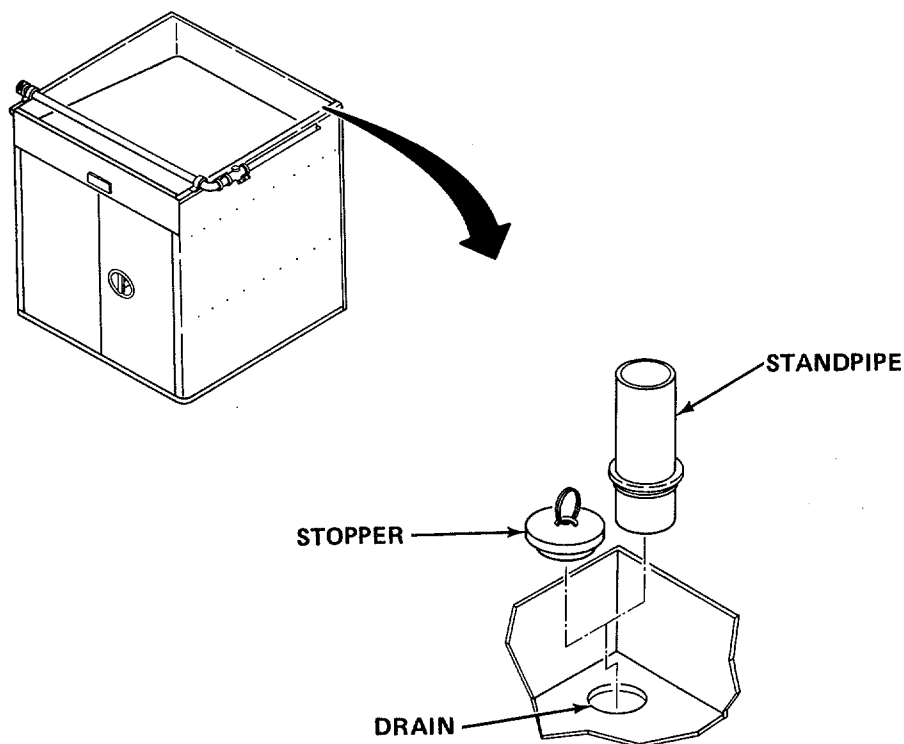
4-6. OPERATION UNDER USUAL CONDITIONS.

4-6.1 Assembly and Preparation for Use.

- a. Perform before operation (B) PMCS (Table 4-1).

NOTE

Prior to disposal of sink contents, field users should contact their local environmental coordinator, or their industrial hygienist for instructions on disposal of chemicals.



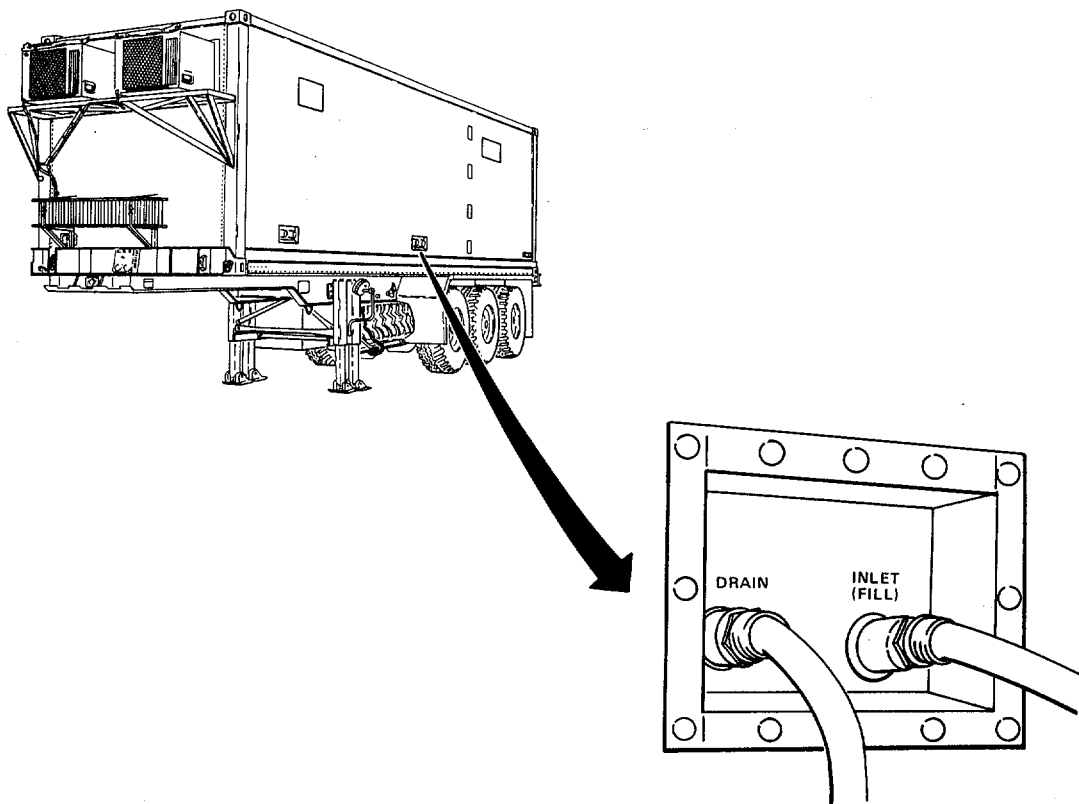
- b. Install stopper or standpipe as required.

4-6.2 Operating Procedures.

- a. Be sure water tank has sufficient water to complete the task.
- b. Use stopper in drain if chemicals are to be contained in sink.
- c. If there is the requirement to spray water and maintain a liquid level, place the standpipe into the drain. The level of liquid will be as high as the standpipe.

4-6.3 Preparation for Movement.**CAUTION**

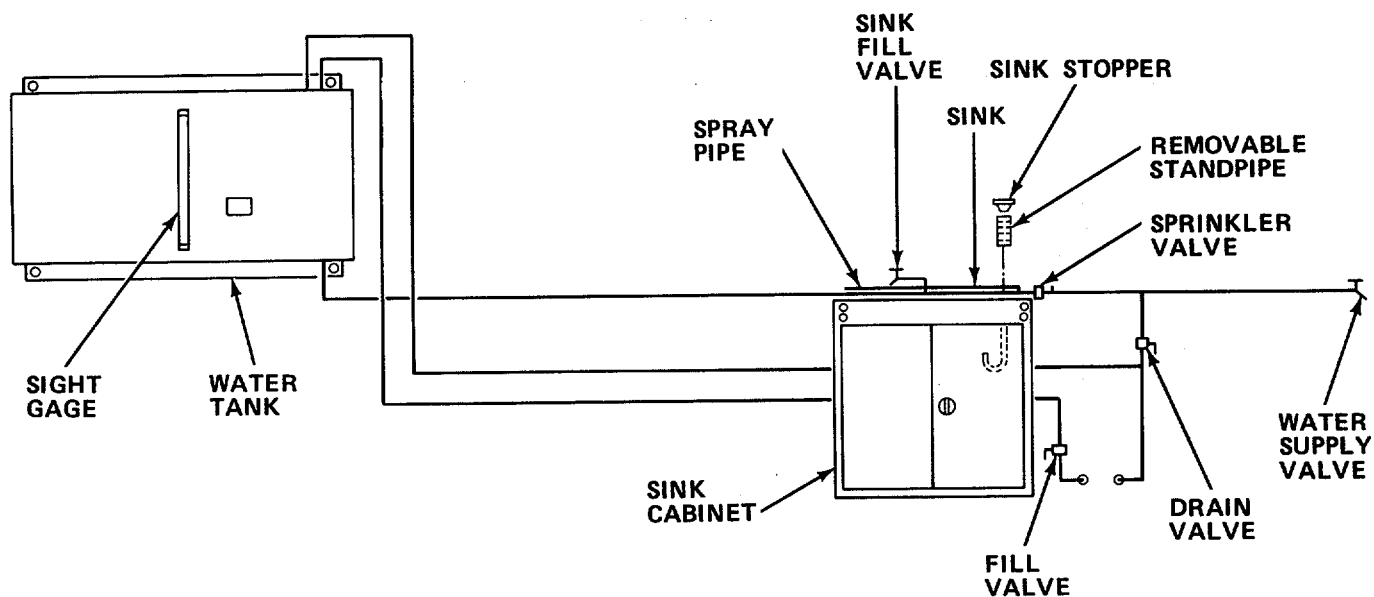
Freezing of water in tank, sink, and/or piping may cause damage to equipment.



- a. Remove cap from fill connector.
- b. Remove cap and connect hose to drain connector.
- c. Open fill valve.

NOTE

Prior to disposal of sink contents, field users should contact their local environmental coordinator, or their industrial hygienist for instructions on disposal of chemicals.

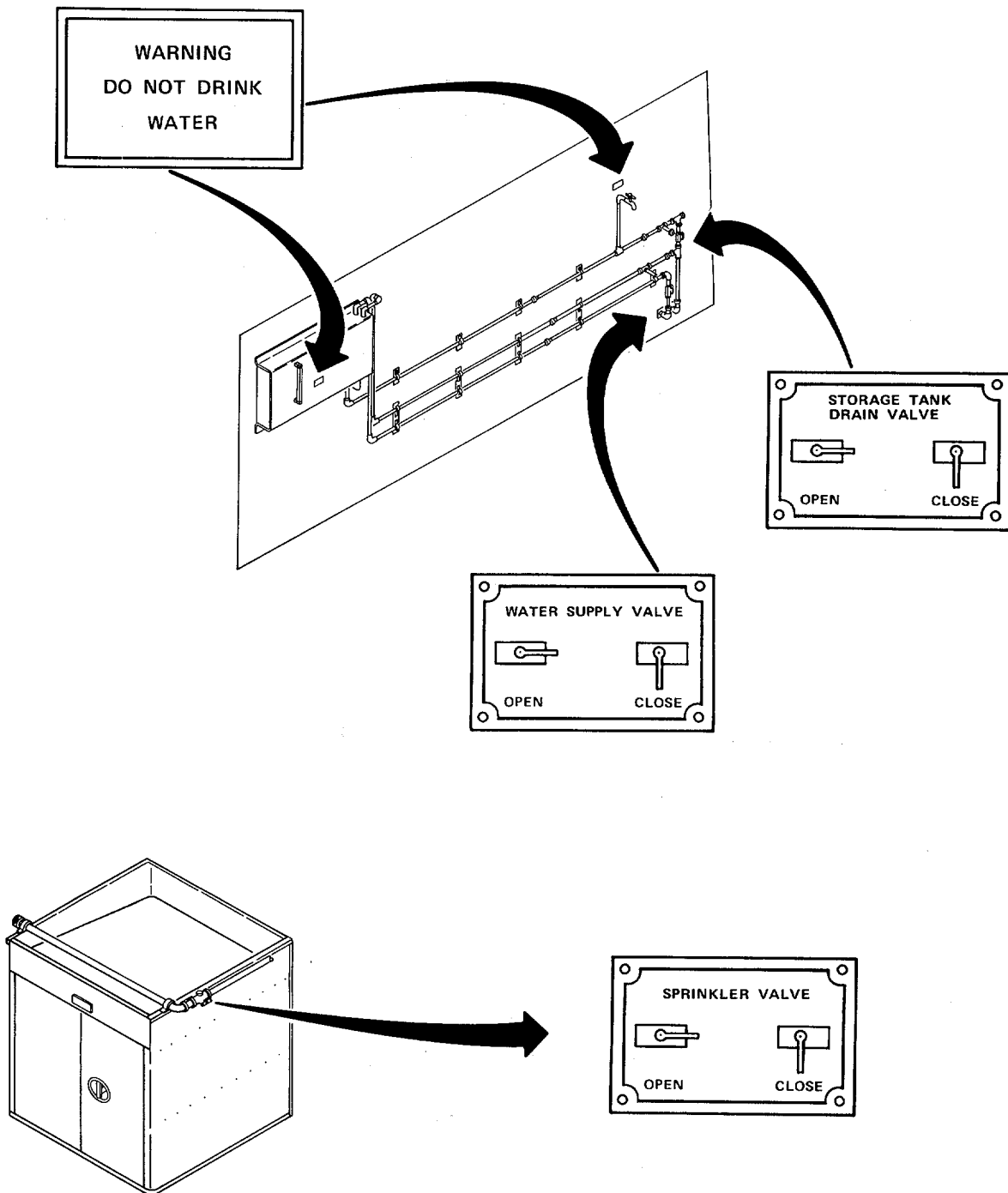


NOTE

Drain location or container should be of sufficient capacity to hold remaining water from sink and tank.

- d. Open drain valve.
- e. When tank stops draining, open sink fill valve and sprinkler valve.
- f. Place plastic utility pail under water supply valve and open valve.
- g. Shut all system valves.
- h. Remove drain hose from drain connector and reinstall connector cap.
- i. Cap fill connector.
- j. Tape standpipe and stopper to shelf in sink cabinet.
- k. Close cabinet doors.

4-6.4 Operating Instructions on Decals and Instruction Plates.



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.

4-9. TROUBLESHOOTING PROCEDURES.

a. This table lists the common malfunctions which may occur during the operation or maintenance of the sink, or its components. You should perform the tests/inspections and corrective actions in the order listed.

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

Table 4-2. TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
--------------------	---------------------------	--------------------------

1. WATER DOES NOT SPRAY.

Step 1. Check level of water in storage tank.

(a) If water level adequate, proceed to step 2.

(b) If tank empty, fill.

Step 2. Check sprinkler valve.

If valve closed, open valve.

2. WATER DOES NOT DRAIN.

Step 1. Check sink drain for stoppage.

(a) Clear drain (paragraph 4-10.1).

(b) If drain is clear, proceed to step 2.

Step 2. Check system line up.

Line up system (Table 4-1).

4-10. MAINTENANCE PROCEDURES.

a. This section contains instructions covering operator maintenance functions for the sink. 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

PROCEDURE	PARAGRAPH
Clear Drain.....	4-10.1

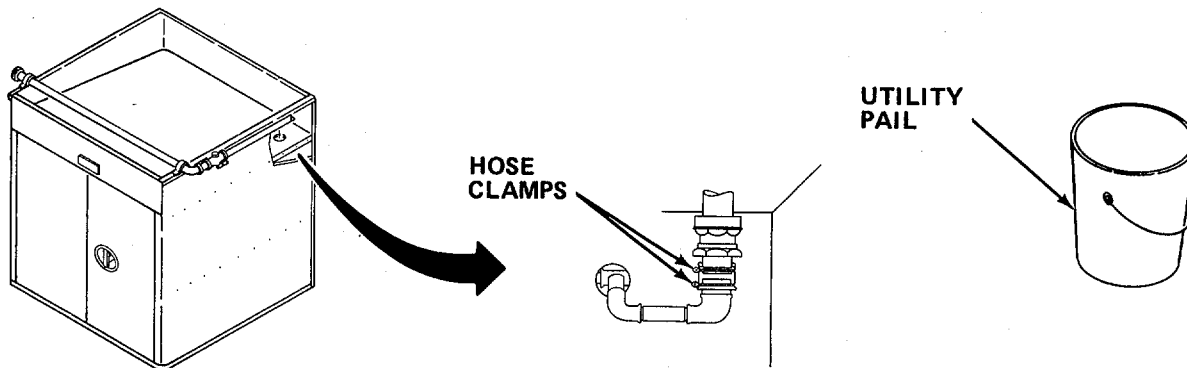
4-10.1 Clear Drain.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
Flat Tip Screwdriver

SUPPLIES: Plastic Utility Pail (Item 35, Appendix E)
Rags (Item 47, Appendix E)



- a. Position plastic utility pail under drain hose.
- b. Loosen hose clamps and pull hose from sink drainpipe.
- c. Inspect drain and hose; remove any foreign objects.
- d. Reposition hose on drain and drainpipe.
- e. Tighten hose clamps; be certain that clamps are over sink drain and drainpipe.
- f. Clean up any spilled liquid.

Section IV ORGANIZATIONAL MAINTENANCE

4-11. LUBRICATION INSTRUCTIONS . This equipment does not require lubrication.

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 5-3610-285-24P 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 shipment 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 . There are no organizational PMCS procedures assigned for this equipment.

4-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES . There are no organizational troubleshooting procedures assigned for this equipment.

4-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the sink. 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

PROCEDURE	PARAGRAPH
Replace Latch	4-16.1
Remove/Install Water Tank	4-16.2
Remove/Install Sink	4-16.3

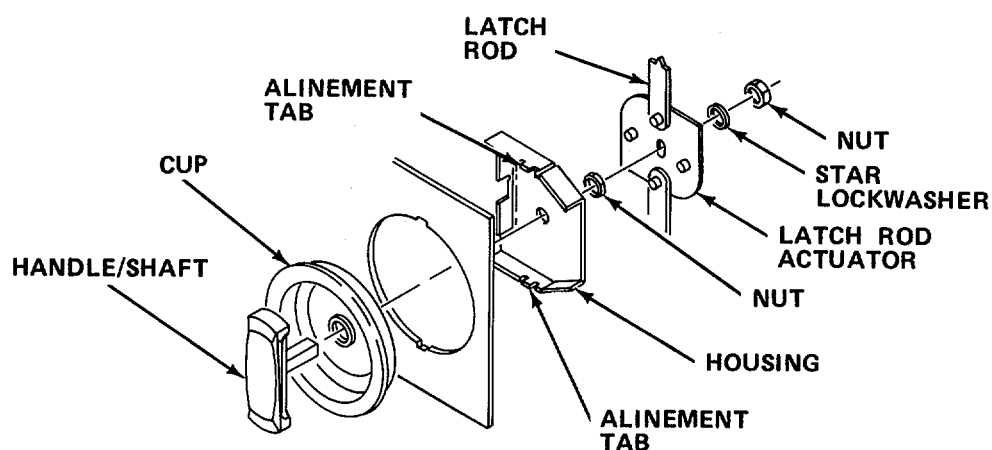
4-16.1 Replace Latch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
Combination Wrench Set

SUPPLIES: Flush Cup-Type Latch



- a. Remove nut and lockwasher from shaft.
- b. Remove latch rod actuator and two latch rods.
- c. Remove nut and housing.
- d. Remove handle/shaft and cup.
- e. Install new cup handle/shaft.
- f. Install new housing. Be sure alinement tabs on housing are inserted in notches cut in door. Attach housing, finger tight, with nut.
- g. Reinsert latch rods into guides located at top and bottom of door.
- h. Reinstall latch rods on upper and lower actuator pins and secure actuator against housing with lockwasher and nut.

4-16.2 Remove/Install Water Tank.

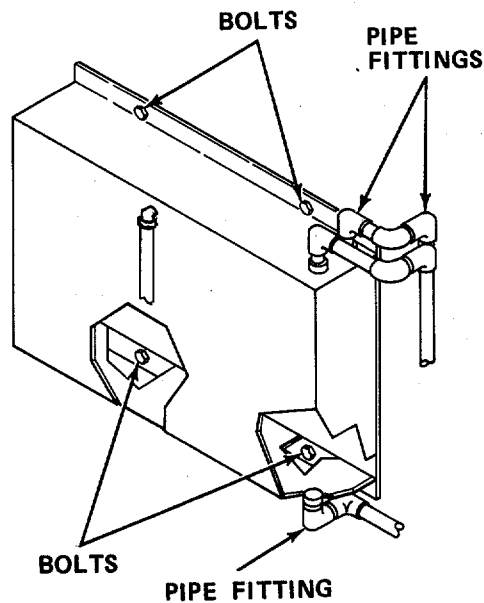
MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Four persons are required to perform this procedure.

TOOLS:

Tool Kit, Light Machine Repair
 1/2 in. Drive Socket Set
 14 in. Pipe Wrench
 Electric Drill and Drill Bits
 Rivet Gun

SUPPLIES: Thread Sealant Tape (Item 66, Appendix E)
 Water Tank
 Rivets
 Silicone Sealant (Item 51, Appendix E)



- a. Drain water from tank.

NOTE

Before removing fittings, close all valves.

- b. Disconnect all water tank plumbing.
- c. Using drill and drill bit, remove rivets and covers on the outside of van that cover mounting bolt hole for tank.

WARNING

Serious injury may occur if insufficient number of personnel are used to move this tank. Tank weighs approximately 150 lbs. (68 kg).

- d. Support tank and remove mounting bolts.
- e. Remove all remaining hardware and replace defective tank.

NOTE

Apply thread sealant tape to all plumbing fittings during reinstallation.

- f. Reinstall hardware removed in step (e) onto new tank.

WARNING

Serious injury may occur if insufficient number of personnel are used to move this tank. This tank weighs approximately 150 lbs. (68 kg).

- g. Support new tank and reinstall mounting bolts.
- h. Place silicone sealant on bolt hole covers and reinstall covers on outside of van.
- i. Reconnect all tank plumbing.

NOTE

Open all valves previously shut.

- j. Refill tank.

4-16.3 Remove/Install Sink.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Four persons are required to perform this procedure.

TOOLS:

- Tool Kit, Light Machine Repair
- 1/2 in. Drive Socket Set
- Cross Tip Screwdriver
- Flat Tip Screwdriver
- 14 in. Pipe Wrench (2)

SUPPLIES: Thread Sealant Tape (Item 66, Appendix E) Sink

- a. Remove flip-top platemaker (Chapter 2, paragraph 2-16.22).

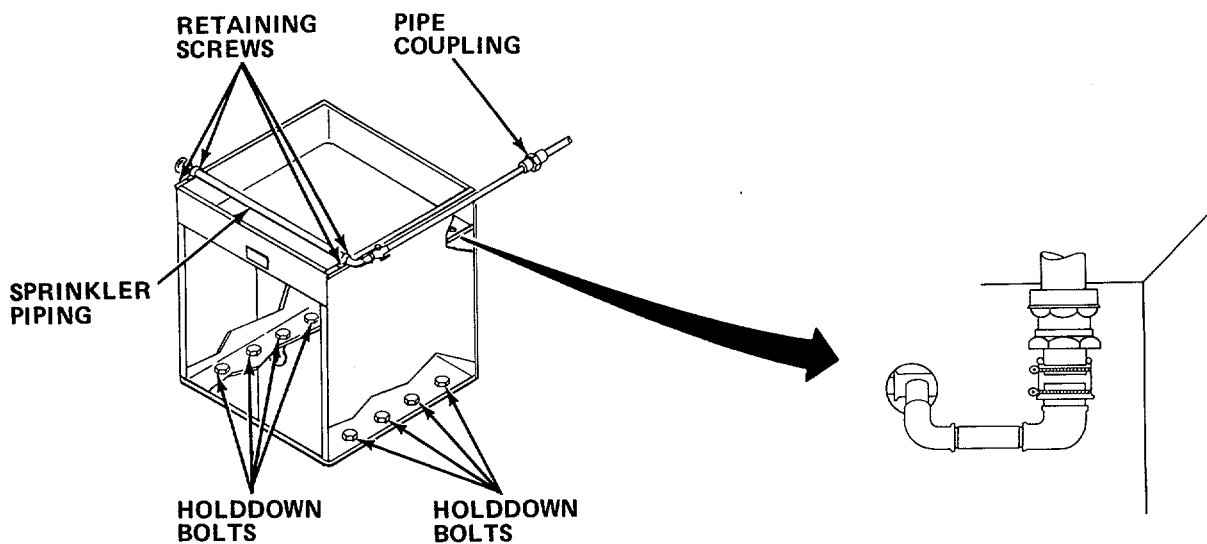
NOTE

Prior to disposal of sink contents, field users should contact their local environmental coordinator, or their industrial hygienist for instructions on disposal of chemicals.

- b. Drain sink and water tank.
- c. Remove contents from cabinet.

NOTE

Retain all parts removed from sink for installation on replacement sink.



- d. Disconnect and remove sprinkler piping from sink.
- e. Disconnect and remove sink drain.
- f. Unbolt sink from floor.
- g. Remove from section.
- h. Install new sink and bolt to floor.

NOTE

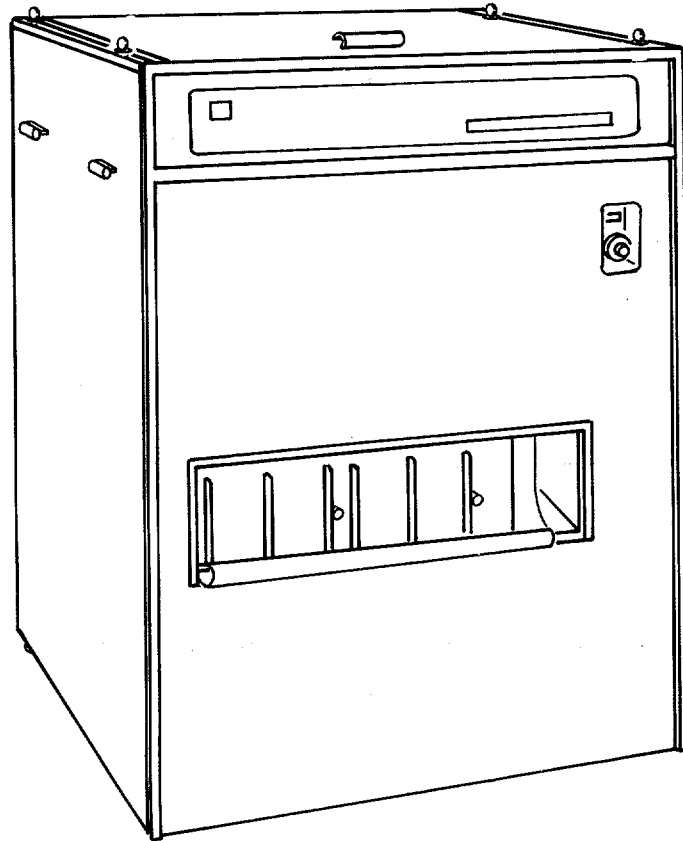
Use thread sealant tape on all pipe joints.

- i. Install sprinkler piping.
- j. Reconnect sink drain.
- k. Reinstall flip-top platemaker (Chapter 2, paragraph 2-16.22).

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.



CHAPTER 5

FILM PROCESSOR

Section I. INTRODUCTION

5-1. GENERAL INFORMATION .

5-1.1 Scope.

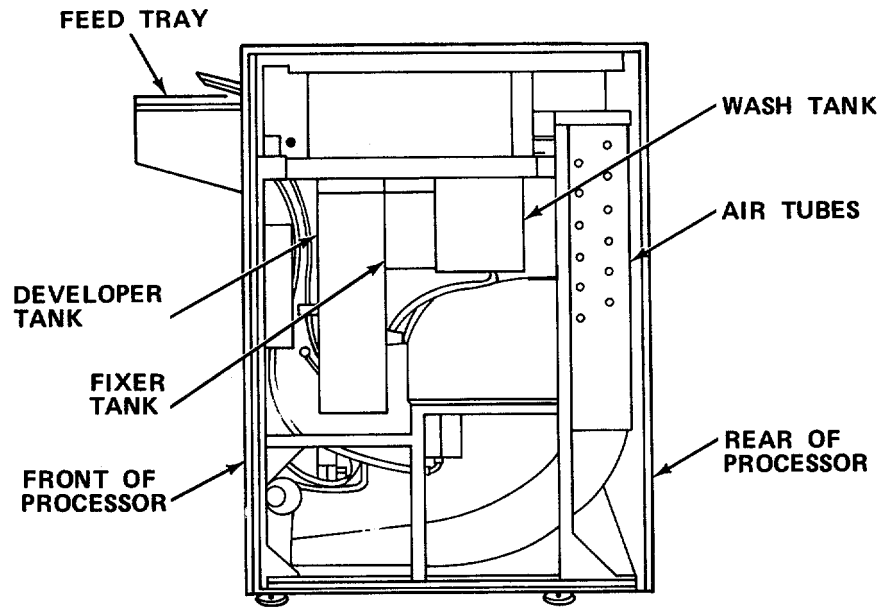
- a. Model Number and Equipment Name. Model 324C-N Film Processor. Data plate located behind rear panel.
- b. Purpose of Equipment. To automatically process and dry a variety of graphic art film.

5-2. EQUIPMENT DESCRIPTION AND DATA.

5-2.1 Equipment Characteristics, Capabilities, and Features.

- a. Develops, fixes, washes, and dries graphic art film.
- b. Replenishment system automatically starts when film is fed, and stops when film has entered processor.
- c. Built-in flowmeters allow quick, easy adjustment of developer and fixer flow rates.
- d. Lift-out roller assemblies provide fast, easy cleaning.
- e. Self-sustaining for only 72 hours operation.
- f. A solid-state electronic heater control maintains developer temperature.
- g. Rollerless crossovers and turnarounds minimize mottle and streaking.
- h. Standby feature reduces water and electricity consumption, and reduces wear between jobs.
- i. External recycling pressure and sump pumps supply wash water to processor.
- j. Wall-mounted, thermostatically controlled water recirculation tank with water level indicator.
- k. Auxiliary chiller cools developer solution before entering processor.
- l. Filter cleans recirculated wash water before entering processor.
- m. Multiple drain valves allow convenient draining of processor system.

5-2.2 Location and Description of Major Components.



MAJOR COMPONENTS - RIGHT SIDE

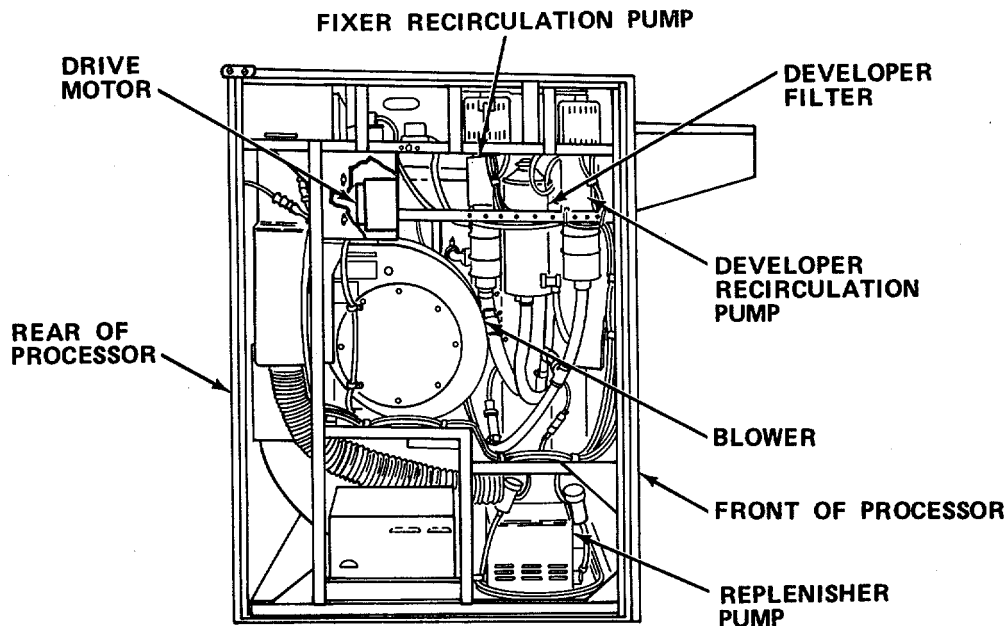
FEED TRAY. Positions and guides film into entrance roller.

WASH TANK. Contains wash water and wash rack assembly.

AIR TUBES. Direct drying air onto film to dry film.

FIXER TANK. Contains fixer solution and fixer rack assembly.

DEVELOPER TANK. Contains developer solution and developer rack assembly.



MAJOR COMPONENTS - LEFT SIDE

MAJOR COMPONENTS - LEFT SIDE

DRIVE MOTOR. Provides power for roller transport system.

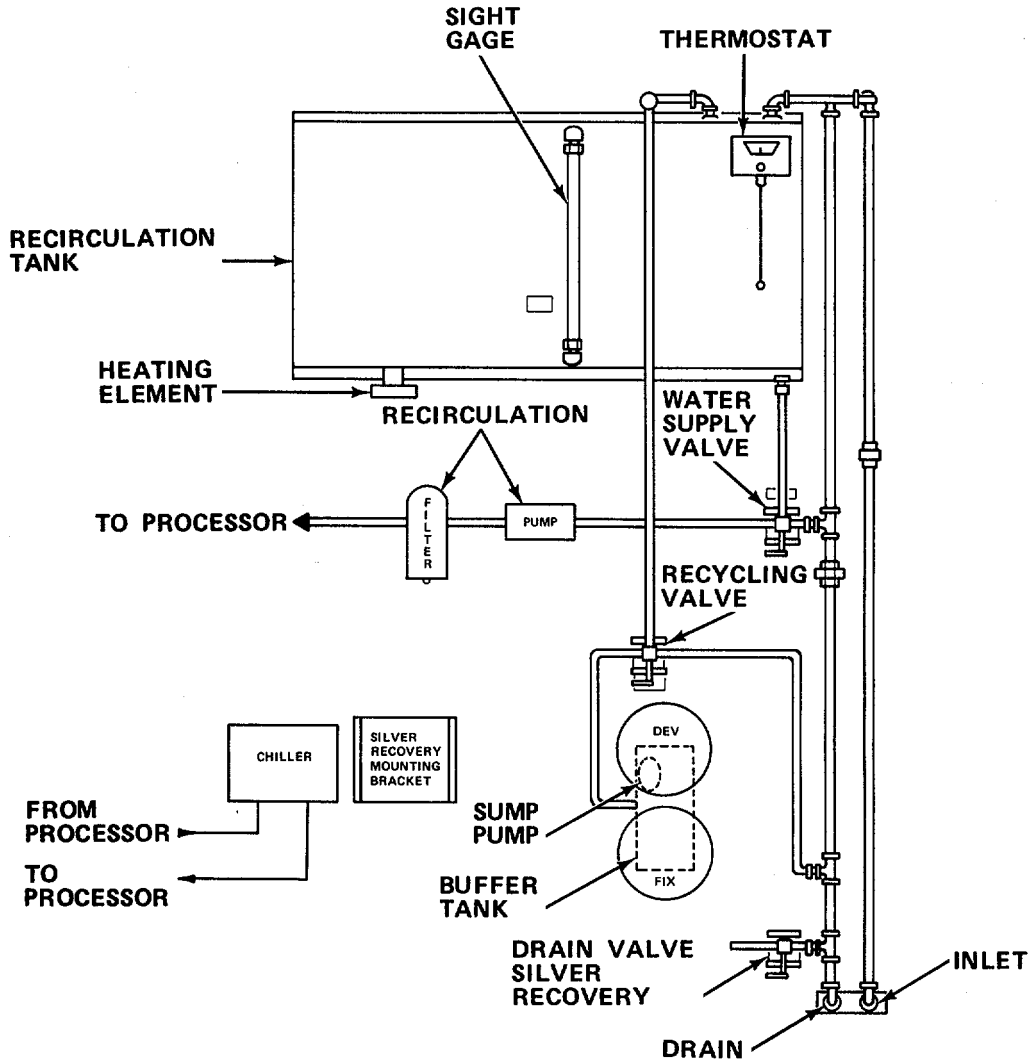
FIXER RECIRCULATION PUMP. Recirculates fixer solution in fixer tank.

DEVELOPER FILTER. Filters recirculating developer solution.

DEVELOPER RECIRCULATION PUMP. Recirculates developer solution from developer tank to auxiliary chiller, developer filter, developer heater, and then back to developer tank.

BLOWER. Provides air flow to drying system.

REPLENISHER PUMP. Provides replenishment solutions for developer and fixer tanks.



RECIRCULATION TANK. Stores recirculated wash water.

SIGHT GAGE. Indicates water level in tank.

THERMOSTAT. Controls heating element and indicates water temperature.

RECYCLING VALVE. Directs wash water from sump pump to either the recirculation tank or drain.

WATER SUPPLY VALVE. Directs wash water from recirculation tank to either the recirculation pump or drain.

RECIRCULATION PUMP. Recirculates wash water from recirculation tank, through the recirculation filter into the processor wash system.

RECIRCULATION FILTER. Cleans recirculated wash water before reentering processor wash system.

SUMP PUMP. Pumps wash water from processor to the recirculation tank or to drain.

HEATING ELEMENT. Heats water in recirculation tank.

CHILLER. Cools developer solution before entering processor developer tank.

SILVER RECOVERY MOUNTING BRACKET. Supports user provided silver recovery unit.

DRAIN VALVE SILVER RECOVERY. Drains fluid from silver recovery unit.

REPLENISHER TANKS. Contain developer and fixer solutions to replenish processing system.

5-2.3 Equipment Data.

Manufacturer Eastman Kodak Company

Model 324C-N

Weight, Dry 850 lbs (385 kg)

Weight, Wet 1,000 lbs (454 kg)

Height 48 in. (121.9 cm)

Width 38.38 in. (97.5 cm)

Length 55.94 in. (142 cm)

Processor Tank Capacities:

Developer 12 gal. (45 l)

Fixer 5.5 gal. (20.8 l)

Wash 5.5 gal. (20.8 l)

Film Transport Speed 0-4 ft/min (0-121.9 cm/min)

Photographic Material Specifications:

Minimum Length 7 in. (17.8 cm)

Maximum Length 10 ft (3.05 cm)

Minimum Width 5 in. (12.7 cm)

Maximum Width 24 in. (61 cm)

Minimum Thickness w/Leader 0.025 in. (.635 mm)

Minimum Thickness wo/Leader 0.004 in. (.102 mm)

Maximum Thickness 0.007 in. (.178 mm)

Air Supply 50 cfm (1.42 m³/min)

Heat Radiation 2700 Btu/hr

Processor Water Flow 1/3 - 1 gpm
(1.25 - 3.79 l/min)

Plumbing System Specifications:

Fixer Replenisher Tank. 7 gal. (26.5 l)

Developer Replenisher Tank 7 gal. (26.5 l)

Recirculation Tank Capacity 50 gal. (189.27 l)

Recirculation Pump Capacity 1.0 gpm (3.8 l/min)

Sump Pump Capacity 6.6 gpm (25 l/min)

Heating Element Power Requirement 1000 watts (3413 Btu/hr)

Thermostat Range -40°F to 12°F
(-40°C to 48.9°C)

Processor Electrical Requirements 115/208 V, 50/60 Hz, single phase

NOTE

The processor is shipped wired to operate on 120/208-volt, 3-wire, 1-phase 50/60 Hz. It can be rewired at installation to operate on 115/230-volt, 3-wire, 1-phase, 50/60 Hz, or 230-volt, 2-wire, grounded neutral, 50/60 Hz.

5-3. TECHNICAL PRINCIPLES OF OPERATION. The film processor is used to automatically process and dry a variety of graphic art film. It is composed of the following:

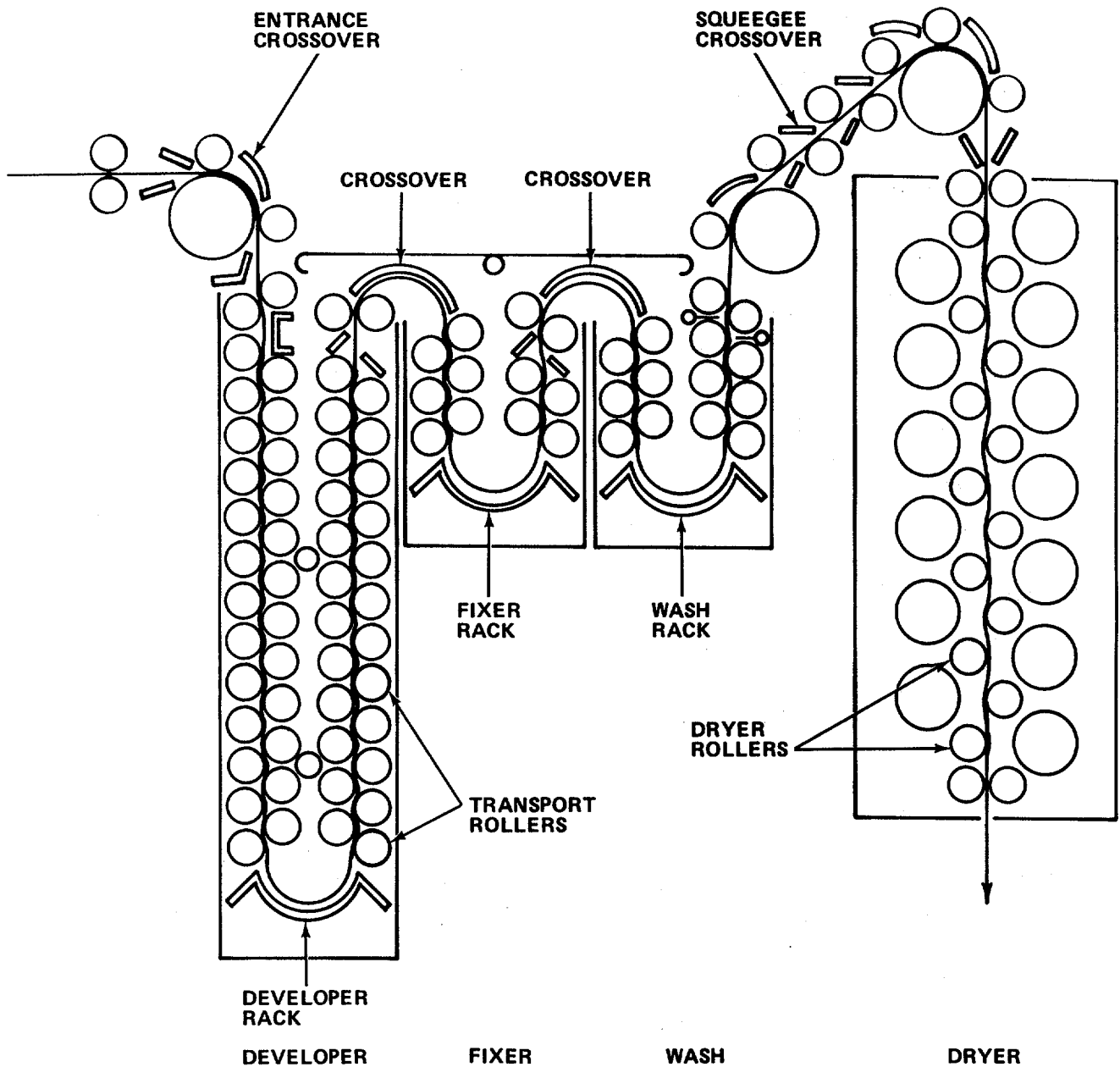
Transport System

Processing Fluid System

Drying System

Electrical System

Plumbing System



5-3.1 Transport System. Transports the film through the various processing systems of the unit. It is composed of the following assemblies:

- Entrance Crossover
- Developer Rack
- Fixer Rack
- Wash Rack
- Crossovers
- Squeegee Crossover
- Dryer Rollers

a. Entrance crossover. Gear-driven rollers direct film into developer rack after being fed into processor entrance. Detector microswitches located above the entrance rollers detect the introduction of film and activate the replenisher pumps and timed signal bell circuits.

b. Developer rack. Transports film through developer solution.

c. Fixer rack. Transports film through fixer solution.

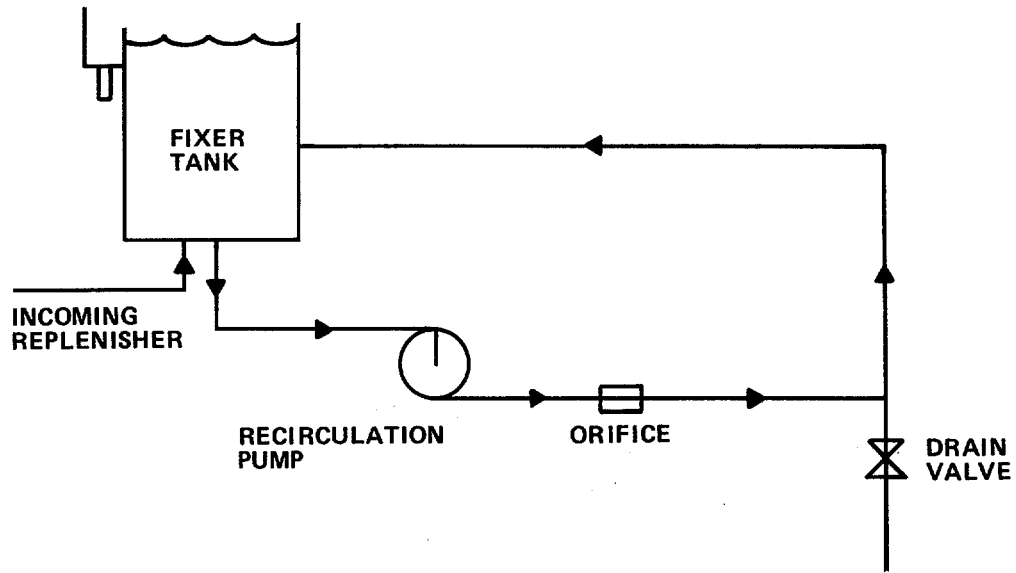
d. Wash rack. Transports film through a wash water bath.

e. Crossovers. Transport between developer/fixer and fixer/wash racks.

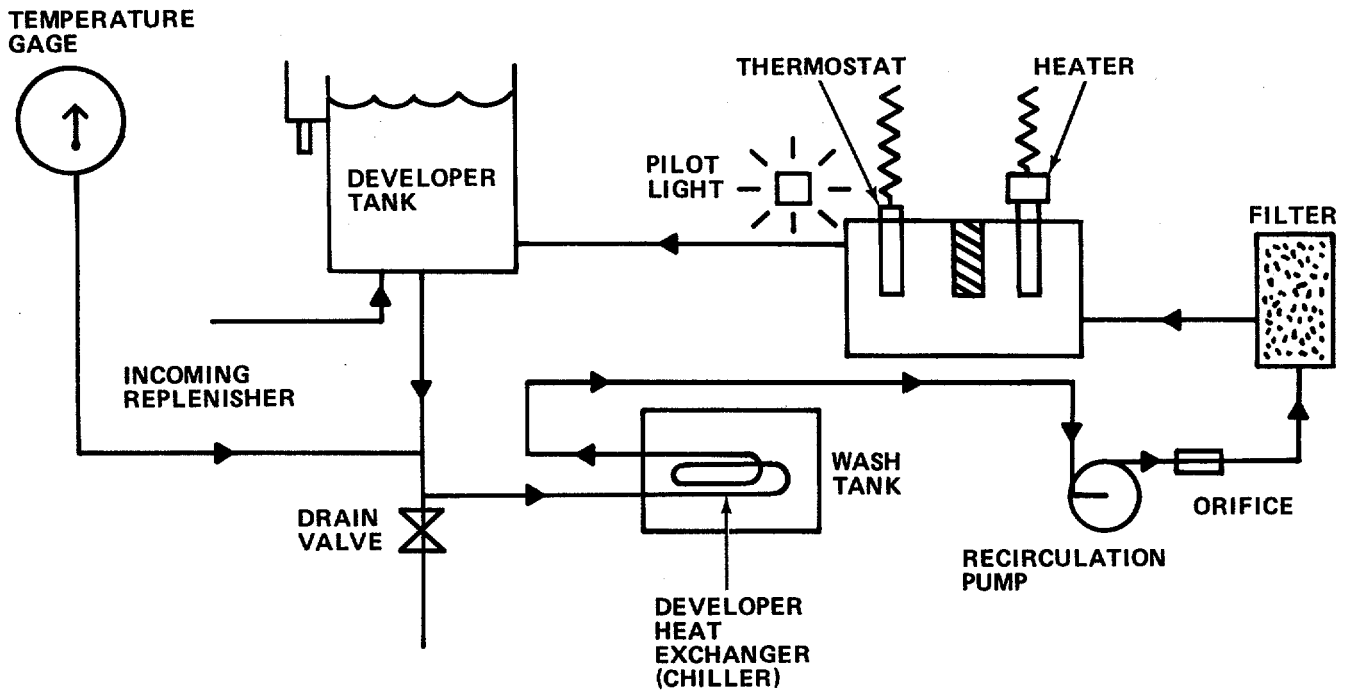
f. Squeegee crossover. Removes excess water from film after it leaves wash tank and before entering dryer rollers.

g. Dryer rollers. Transport film between air tubes to dry remaining water from film surface.

FIXER RECIRCULATION SECTION



DEVELOPER RECIRCULATION SECTION

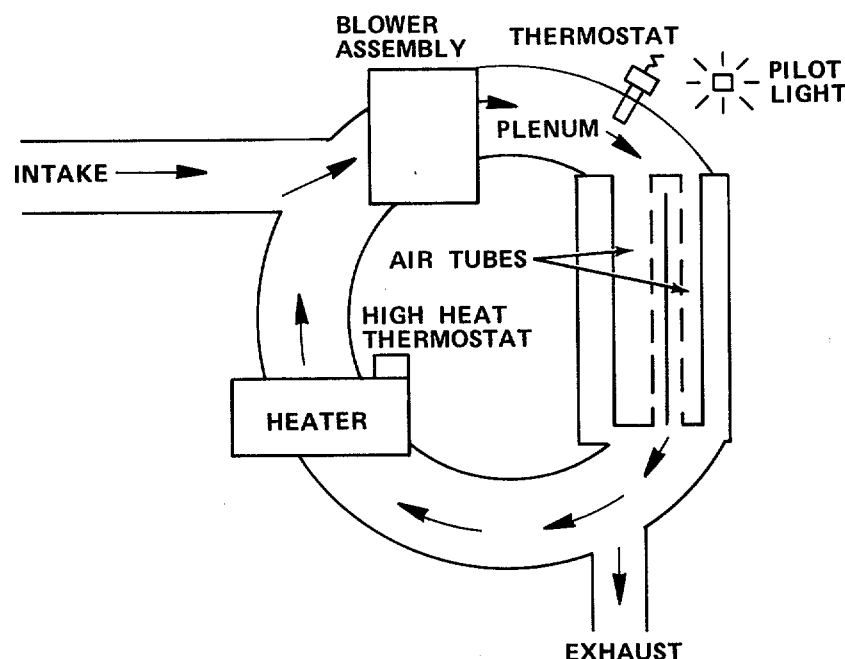


5-3.2 Processing Fluid System. Provides developer, fixer, and wash water, their recirculation, replenishment, and filtering. It is composed of the following components:

Developer Tank
Fixer Tank
Wash Tank
Recirculation Pumps
Replenisher Pump Unit
Chiller

- a. Developer tank. Contains developer and rack. Film enters developer tank in the first step of processing.
- b. Fixer tank. Contains fixer and rack. Film enters fixer tank after exiting developer tank in the second step of processing.
- c. Wash tank. Contains wash rack and filtered water to wash fixer off the film prior to entering drying system.
- d. Recirculation pumps. Two centrifugal pumps recirculate developer and fixer. Developer is drawn from tank, pumped through the chiller, developer filter and heater, then dispersed evenly throughout the tank. Fixer is drawn from its tank, pumped through its recirculation system, then flows back into bottom of fixer tank.
- e. Replenisher pump unit. Contains two centrifugal pumps and a common motor. Replenisher pumps are turned on whenever a piece of film passes through detector rollers and trip detector switches above the rollers. Pumps then move developer and fixer replenishment solutions from their external storage tanks, through strainers, then through flowmeters where flow rate is governed before passing into processor tanks. Pumps cease operating after film has passed detector roller.
- f. Chiller. Cools developer automatically to maintain proper fluid temperature. It consists of a small, self-contained refrigeration unit and heat exchanger to cool developer before reentering processing system.

AIR CIRCULATION/RECIRCULATION SECTION



5-3.3 Drying System. Directs warm, dry air to both sides of film as it passes through dryer rollers. It is composed of the following components:

Blower
Heater
Air Tubes

- a. Blower. A centrifugal fan which draws air past heater element and pumps it to air tubes.
- b. Heater. Consists of an electric heating element which heats air entering blower. A thermostat located on the back of the processor controls air temperature. A pilot light above the thermostat indicates when heater is on.
- c. Air tubes. Directs heated air from blower onto surface of film as it passes through dryer rollers.

5-3.4 Electrical System. Provides power for processor controls, indicators, drive motor, blower, dryer heater, pumps, and illumination of gages (refer to FO-2 through FO-16 for electrical schematics and diagrams). It is composed of the following electrical circuits:

Transport Drive Circuit
Developer Heater Circuit
Dryer Circuit

Developer and Fixer Recirculation Pumps Circuit
 Developer and Fixer Replenishment Pump Unit Circuit
 Timer Bell Circuit
 Gage Illumination Circuit
 Water Control Circuit
 Standby Control Circuit

a. Transport drive circuit.

(1) Controls on/off operation and speed of transport drive motor. A switch controls on/off operation of the motor while a variable-speed knob controls its speed. A speed indicator dial indicates speed of transport mechanism in centimeters per minute.

(2) Actuating MAIN DRIVE switch (S5). When the top cover is in place (S7 actuated), S5 provides an ac voltage to the motor speed controller (AI). The motor speed controller provides dc drive for the main motor. The voltage provided to the motor is established by adjusting TRANSPORT SPEED control (R2). The motor speed controller maintains the proper voltage to the motor and the proper drive speed. Interrupting the signal from R2 to the motor speed controller (AI), pin P1 will stop the drive motor. The optical-coupler (U4) on circuit board 500 is turned on when the processor is not in standby. When the processor enters standby, U4 is turned off. This interrupts the signal between R2 and P1 of the motor speed controller and shuts off the main drive motor. Actuating MAIN DRIVE switch (S5) also provides power to the 5 volt regulator (U2) on circuit board 600. This powers the speed readout meter by way of wires 53 and 54. The speed readout meter is also provided a filtered signal from the tach generator by way of CR1, C1, R1 and R3 on circuit board 900. The speed readout meter displays the filtered signal from circuit board 900 as the drive speed in centimeters per minute. Potentiometer R3 on circuit board 900 allows calibration for the speed readout meter.

b. Developer heater circuit.

(1) Consists of a developer thermostat which controls operation of developer heater and maintains a preset temperature. Developer heater circuit is activated when pump switch is on.

(2) Circuit description.

(a) Circuit board 600. Actuating MAIN DRIVE switch (S5) applies an ac voltage to transformer T1. This voltage is stepped down to 16 V ac and rectified to dc by circuit CR1. The rectified dc voltage is filtered by capacitors C1 and C3, and regulated to 12 V dc by voltage regulator U1. When dryer fan switch (S3) is actuated, the regulated 12 V dc energizes developer temperature control circuit board 700.

(b) Circuit board 700. The voltage divider network of resistors R2, R3, and R4 provide the reference voltage to pin 3 of voltage comparator U1. The desired developer temperature is selected by adjusting resistor R4 which establishes the desired reference voltage at pin 3 of U1. If the voltage at pin 2 is greater than the voltage at pin 3, the output at pin 7 goes high. Transistor Q1 is turned on; therefore, CR1 LED is on. The collector of Q1 goes low, and solid-state relay U3 is now energized with a high at wire 32 and a low at wire 33. This action energizes the developer heaters. As the developer temperature increases, the resistance of thermistor RT-1 decreases, and the voltage at pin 2 of voltage comparator U1 also decreases. When the voltage at pin 2 is less than the voltage at pin 3, the output at pin 7 of voltage comparator U1 goes low. Transistor Q1 is turned off; therefore, CR1 LED is off. The collector of Q1 now goes high, and solid state relay U3 is deenergized and turns off the developer heaters.

c. Dryer circuit.

(1) Controlled by a switch which activates blower. The switch also activates dryer heater element. Dryer heater element temperature is controlled by dryer thermostat.

(2) Circuit description.

(a) Actuating MAIN DRIVE switch (S5) applies an ac voltage on transformer T1. Transformer T1 steps down the voltage to 16 V ac and circuit CR1 rectifies the voltage to dc. Rectified dc voltage is filtered by capacitors C1 and C3 and regulated to 12 V dc by voltage regulator U1. Actuating dryer fan switch (S3) delivers 12 V dc to dryer temperature control circuit board 800 and developer temperature circuit board 700. When the dryer is calling for heat, transistor Q1 (NPN) on circuit board 800 is turned on with a high at its base. The collector then goes low. This low is sensed at voltage inverter U1 pin 6 on standby control circuit board 500. Transistor Q1 (PNP Darlington) on circuit board 500 is turned on with a low at pin 4 of satisfied AND gate U5. This, in turn, energizes solid-state relay U1, thereby energizing dryer heaters. In addition, transistor Q2 (NPN Darlington) is turned on with a high at pin 8 of standby timer U3 and with a low at the collector of transistor Q1. This energizes solid-state relay U2 and turns dryer blower motor (B1) on. When the dryer is at operating temperature (AND gate U6, pin 5, on circuit board 500 goes high), and with no film fed into the detector roller assembly (AND gate U6, pin 6 goes high) within six minutes, the processor will go into standby mode for eight minutes (standby timer U3, pin 8, low), and then automatically return to run mode to reheat the dryer. When the dryer reaches temperature, or after ten seconds, if the dryer is not calling for heat, the processor will return to standby mode (standby timer U3, pin 8, low). In the standby mode, the dryer heaters, blower motor, and drive motor are off.

d. Developer and fixer recirculation pumps circuit.

(1) Provides power to developer and fixer recirculation pumps. The developer and fixer recirculation pumps circuit is activated by the standby reset switch.

(2) Circuit description. Actuating MAIN DRIVE switch (S5) applies an ac voltage to transformer T1. This voltage is stepped down to 16 V ac and rectified to dc by circuit CR1. This rectified dc voltage is now filtered by capacitors C1 and C3, and regulated to 12 V dc by voltage regulator U1. When dryer fan switch (S3) is actuated, the regulated 12 V dc energizes relay K603, which energizes the recirculation pumps B2 and B3.

e. Developer and fixer replenisher pump unit circuit.

(1) Provides power to the developer and fixer replenisher pumps. The circuit is activated by placing REPL PUMP switch to MANUAL, or by placing the switch to AUTO and activating detector switches in film detector crossover. Developer and fixer replenisher pumps will deactivate after detector switch has deactivated, and the film has had sufficient time to enter the processor.

(2) Circuit description.

(a) Circuit board 600. Actuating the MAIN DRIVE switch (S5) applies an ac voltage to transformer T1. This is stepped down to 16 V ac and rectified to dc by CR1. This voltage is regulated to 12 V dc by voltage regulator U1 and then applied to the detector roller assembly (MS1 and MS2).

(b) Circuit board 500. With film present, detector switches MS1 and MS2 actuate, thereby delivering ground potential (low) to pin 3 of voltage inverter U1 on circuit board 500. Output at pin 4 of U1 goes high. A high at pin 5 of U8 on circuit board 500 satisfies the OR gate with a high at output on pin 4. Transistor Q4 (NPN Darlington) is turned on. Collector of Q4 is low, thereby actuating relay K601. Normally closed contacts 1/9 of relay K601 are now open, thereby deenergizing the safelight receptacle. Transistor Q5 (PNP Darlington) is also on. Output goes low. This low is sensed at wire 84 to solid-state relay U5. Actuating dryer fan switch (S3) energizes the solid state relay U5, thereby energizing the replenisher pump B4 (REPL PUMP switch S1 in AUTO). When film clears the detector roller assembly (MS1 and MS2), pin 3 of voltage inverter U1 on circuit board 500 goes high and pin 4 goes low. This transition from high to low at pin 4 of U1 triggers timer U7A by way of capacitor C13. U7A pin 9 goes high for a preset period determined by resistor R3. At the end of that period U7A pin 9 goes low. This high-to-low transition triggers timer U7B pin 6 through C15. U7B pin 5 now goes high, actuating feed signal buzzer DS1 for approximately one second.

f. Timer bell circuit. Is activated by the STANDBY RESET switch. The circuit senses when film has passed through the detector switches and signals a bell after a predetermined time interval to indicate when more film may be fed into processor.

g. Gage Illumination Circuit. Provides indirect lighting for the gages and flowmeter, and is controlled by the DRIVE METER switch and LAMPS switch.

h. Water Control Circuit.

(1) Consists of a series of temperature controlled solenoid valves to aid in maintaining proper operating temperature of wash water and developer.

(2) Circuit description.

- (a) Solenoid valves L1, L2, and L3 control water flow through the developer heat exchanger and into the wash tank.
- (b) When cold wash water is flowing, it takes 1/3 gal/min (1.26.liters/min) through the heat exchanger to control the developer temperature. When warm water is flowing, it takes 1 gal/min (3.8 liters/min) through the heat exchanger to control the developer temperature.
- (c) The solenoid valves operate as follows:

<u>Processor</u>	<u>Solenoid Valves</u>		
	<u>L1</u>	<u>L2</u>	<u>L3</u>
Warm-up			
Developer is not at the desired operating temperature	ON	OFF	OFF
Operating at the desired temperature cold wash water not in standby mode	ON	OFF	ON
Operating at the desired temperature cold wash water in standby mode	OFF	OFF	ON
Operating at the desired temperature warm wash water in or out of standby mode	OFF	ON	ON

(d) Developer temperature control circuit is involved with the water solenoids in the following way: When the processor is first turned on, water must flow to fill wash tank, but the warm-up time is shorter if no water flows through the heat exchanger. To fill wash tank without sending water through heat exchanger, solenoid valve L1 opens as follows:

1 U3 on circuit board 1000 provides a reset pulse to U2A and U2B. This results in a high at pin 10 of U2B.

2 Transistor Q1 on circuit board 1000 is turned on and a WARMUP RESET low is provided to U1, pin 14, on circuit board 500. This results in a low at pin 1 of U6.

3 A low also results at pin 8 of U5.

4 Pin 10 of U5 goes high and provides a high to pin 6 of flip-flop U9. With a high on pin 6 and a low on pin 4, the Q output (pin 2) of U9 goes low, turns on Q3, and actuates relay K602. Relay K602 provides power to solenoid valve L1 when the thermostat THS2 is normally closed. (This is the case with cold wash water.) With warm wash water, L1 is powered during warm-up by THS2, normally open, and relay K1001, normally closed.

(e) When the developer reaches temperature, the collector of transistor Q1 on circuit board 700 goes high and pin 3 of U1 on circuit board 1000 goes high. A high is then provided to pin 1 of U2. Since the output of U3 goes high for a short duration (approximately 10 to 12 seconds), pin 2 of U2 also goes high. U2A and U2B provide a low at pin 3 of U2. Pin 10 of U2B goes low, turns off transistor Q1, and causes a high at pin 14 of U1 on circuit board 500. The low at pin 10 of U2B also turns on transistor Q2, energizes relay K1001, and turns on solenoid valve L3. Solenoid valve L3 provides water to the heat exchanger to help control the developer temperature.

(f) If warm wash water is flowing and THS2 is normally open, then L1 is turned off and L2 is turned on to provide additional water flow through the heat exchanger.

(g) The high at pin 14 of U1 on circuit board 500 results in a high at pin 1 of U6. No film at the detector switches (MS1 and MS2) results in a high at pin 2 of U6 and with both inputs of U6 high, pin 10 of U5 goes low. This triggers the film clear timer U2 and causes the output formed by pins 1 through 8 to go low.

(h) When the film clear timer U2 times out and enters the standby mode, the output goes high and provides clock pulse to U9.

(i) When U9 receives this pulse, pin 2 goes high and turns off transistor Q3, which turns off relay K602.

(j) If cold wash water is flowing and THS2 is normally closed, solenoid valve LI turns off.

i. Standby Control Circuit.

(1) The processor will automatically switch to the standby mode, to reduce water and electricity usage, approximately 6 minutes after last piece of film clears the detector switches. The standby control circuit can be bypassed by operating the toggle switch on circuit board 500.

(2) Circuit description. The standby control circuit is dependent upon the water control circuit, which is dependent upon the developer temperature control circuit for proper operation. However, developer temperature control is maintained independently of the standby mode as follows:

(a) Circuit board 700.

1 The voltage divider network resistors R2, R3, and R4, on circuit board 700 provide the reference voltage to pin 3 of voltage comparator U1 on circuit board 700. The desired developer temperature is selected by adjusting resistor R4 which establishes the desired reference voltage at pin 3 of U1.

2 If the voltage at pin 2 is greater than the voltage at pin 3, the output at pin 7 goes high. Transistor Q1 on circuit board 700 is turned on when the collector goes low, thereby turning on the CR1 LED.

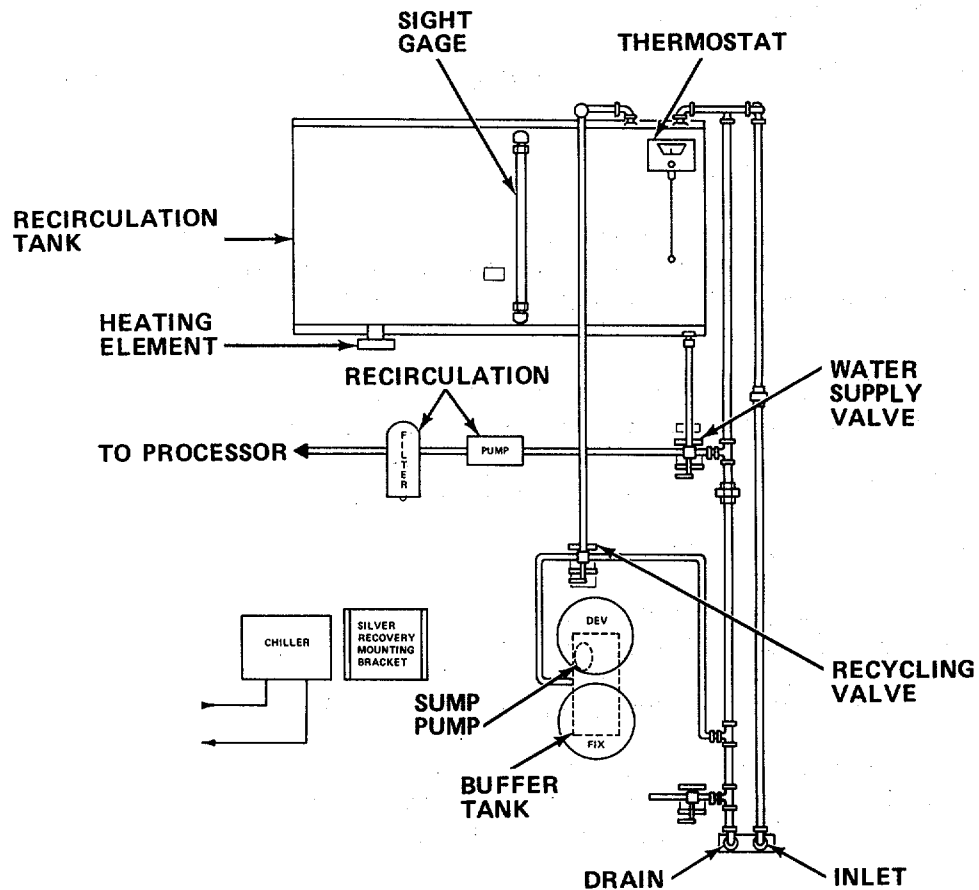
(b) Circuit board 1000.

- 1 This low is sensed on pin 3 of voltage inverter U1 on the water control circuit.
- 2 Transistor Q1 (PNP Darlington) turns on with a low at pin 13 of voltage inverter U1.
- 3 This brings the output of Q1 low.

(c) Circuit board 500.

1 This low is sensed on pin 14 of voltage inverter U1, of the standby control circuit. With film present in the detector roller assembly, voltage inverter U1, pin 3, goes low.

2 This dissatisfies AND gate U6, pin 3, with a low, thereby dissatisfying AND gate U5, pin 10, with a high. Flip-flop U9, pin 2, now changes state from a low to a high. With the dryer at operating temperature (AND gate U6, pin 13, high), AND gate U6 becomes dissatisfied with a low at pin 4. With the low at pin 11, of standby timer U3, the processor now goes out-of standby mode (pin 8 goes high) and into the normal or run operating mode.



5-3.5 Plumbing System. Recirculates, controls temperature, and filters wash water from processor. It consists of:

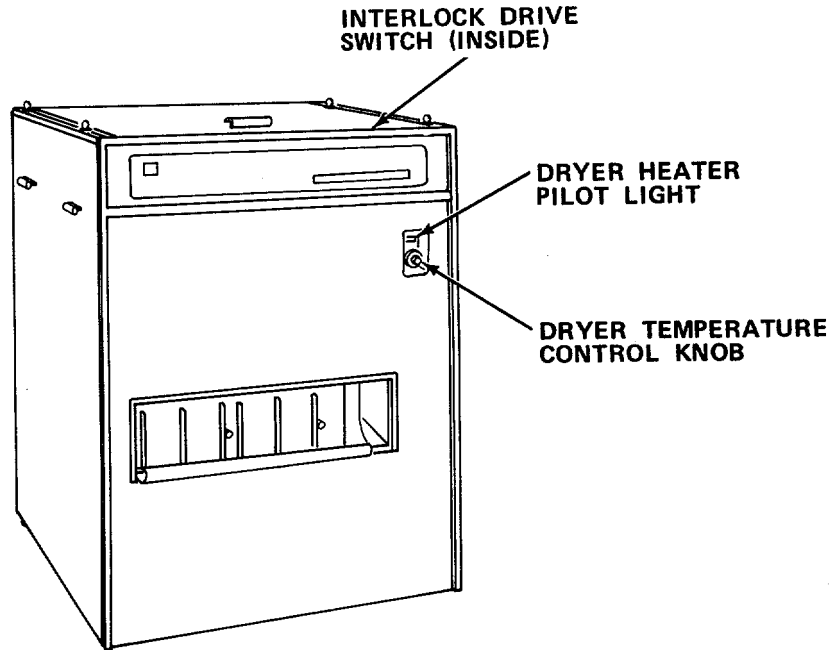
Recirculation Tank
Sump Pump
Recirculation Pump
Recirculation Filter
Recycling Valve
Water Supply Valve

- a. Recirculation tank. Contains wash water which is used in wash system of processor. It contains a sight gage to monitor water level and a thermostatically controlled heating element to maintain water at a preset temperature.
- b. Sump pump. Pumps wash water from processor to recirculation tank or to drain.
- c. Recirculation pump. Pumps wash water from recirculation tank, through the filter, and into water inlet of processor.
- d. Recirculation filter. Filters wash water before entering processor.
- e. Recycling valve. Directs wash water from sump pump to either the recirculation tank or drain.
- f. Water supply valve. Directs wash water from recirculation tank to either the recirculation pump or drain.

Section II. OPERATING INSTRUCTIONS

5-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.

CONTROL OR INDICATOR	FUNCTION
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Interlock Drive Switch

A safety switch which prevents main drive activation if top cover is removed.

Dryer Heater Pilot Light

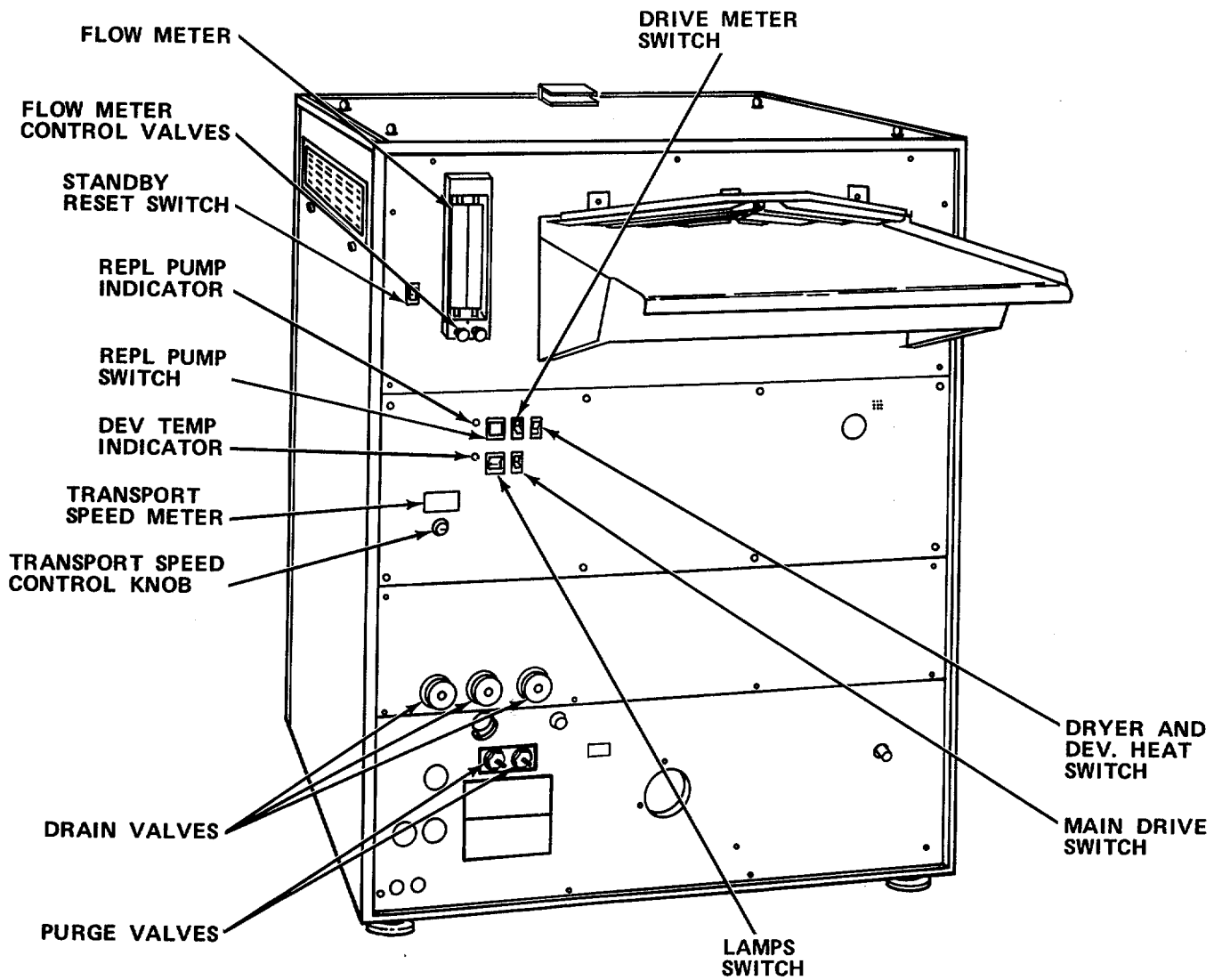
Indicates activation of dryer heater.

DRYER TEMPERATURE Control Knob

Determines temperature of air supply for drying system.

CONTROL OR INDICATOR

FUNCTION



CONTROL AND INDICATORS - FRONT

FLOWMETER

Indicates flow rate of replenisher fluids in cubic centimeters per minute (cc/min.).

DRIVE METER Switch

Illuminates or darkens transport speed indicator numerals.

DRYER and DEV. HEAT Switch

Activates the developer heater, dryer heater, blower motor, and recirculation pumps.

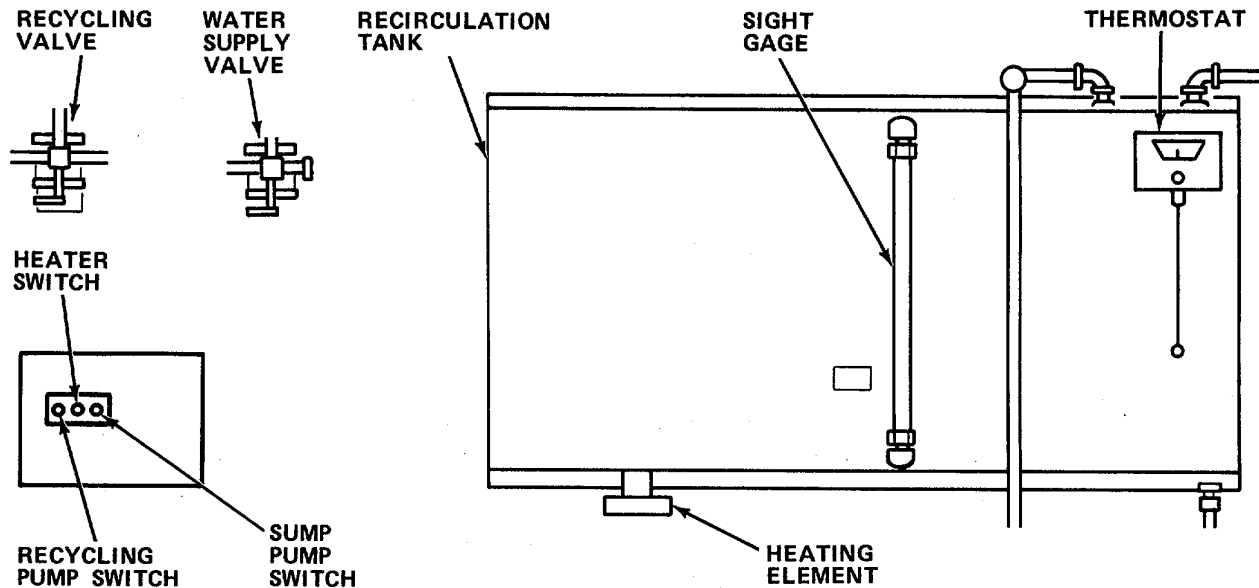
CONTROL OR INDICATOR	FUNCTION
MAIN DRIVE Switch	Activates main drive motor and machine logic.
LAMPS Switch	Activates the lights behind the flowmeter and developer temperature pilot light.
DEV TEMP Indicator Light	Indicates when power is applied to the developer heater. Indicator light will slowly flash on and off when the developer reaches operating temperature.
Drain Valves	Used to drain their three respective processor tanks.
TRANSPORT SPEED Control Knob	Used to select desired transport speed. Increases if rotated right, and decreases if rotated left.
TRANSPORT SPEED METER	Indicates speed of film transport in centimeters per minute (cm/min).
Purge Valves	Purge air from replenishment system.
REPL PUMP Switch	A three-position switch. In AUTO position, the detector roller switches will turn on replenisher pumps, start the feed signal timer, and activate accessory outlet when material is fed between detector rollers. In OFF position, replenisher system is turned off. In MANUAL position, detector switches are bypassed and replenisher pumps are turned on.
REPL PUMP Indicator Light	Indicates when replenisher pumps are activated.
STANDBY RESET Switch	This switch changes processor from STANDBY to OPERATING MODE. The processor is adjusted to automatically change to standby mode after last piece of material clears dryer.

CONTROL OR INDICATOR

FUNCTION

Flowmeter Control Valves

Allow operator to adjust replenishment rate.



Sight Gage

Indicates water level in recirculation tank.

Water Supply Valve

Directs water from recirculation tank to either the recirculation pump or to the drain.

Recycling Valve

Directs water from the sump pump to either the recirculation tank or the drain.

Thermostat

Controls activation of heating element. Black needle indicates water temperature and red needle is controlled by knob to select temperature.

SUMP PUMP Switch

Activates sump pump.

HEATER Switch

Activates power to heating element via thermostat.

Recirculation Pump (RECIRC PUMP) Switch

Activates recirculation pump.

5-5. 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.

5-5.1 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 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. Leakage definitions for operator PMCS shall be classified as follows:

Class I	Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
Class II	Leakage of fluid great enough to form drops but not enough to cause drops to drip from the item being checked/inspected.
Class III	Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

CAUTION

- Equipment operation is allowable with minor leakage's (Class I or II). Of course, you must consider the fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor.
- When operating with Class I or Class II leaks, continue to check fluid levels as required in your PMCS.
- Class III leaks should be reported to your supervisor or organizational maintenance.

g. 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.

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

i. 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.

j. 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.

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

<u>Item</u>	<u>Quantity</u>
Sponge (Item 55, Appendix E)	3 ea
8 in. Adjustable Wrench	1 ea
Drain Pan, 9 x 9 x 3 in.	1 ea
Cross Tip Screwdriver	1 ea
Recirculation Filter	1 ea
1 in. Combination Wrench	1 ea
3/8 in. Combination Wrench	1 ea
9/16 in. Combination Wrench	1 ea
Rags (Item 47, Appendix E)	1 ea
Cheesecloth (Item 14, Appendix E)	ar
Glass Cleaner (Item 11, Appendix E)	ar
Graduated Cylinder	1 ea
Plastic Tubing, 3/8 in. (9.5 mm) I.D.	ar

Table 5-1. 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 safely 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
BI - Biennially

(Number)-Hundreds of Hours

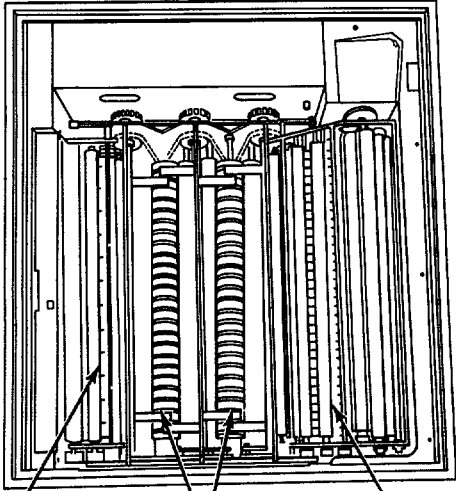
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
1	B	<p><u>FILM PROCESSOR</u></p> <p><u>CAUTION</u> Film processor systems must be fully operational, including recirculation system, or damage to equipment will occur.</p> <p><u>Inspect and Clean Crossover Assemblies.</u></p>  <p>ENTRANCE CROSSOVER CROSSOVERS SQUEEGEE CROSSOVER</p> <p>Remove cover and crossovers. Check for chemical deposits that may have formed on rollers since shutdown. Remove chemical deposits with damp sponge and fresh water.</p>	

Table 5-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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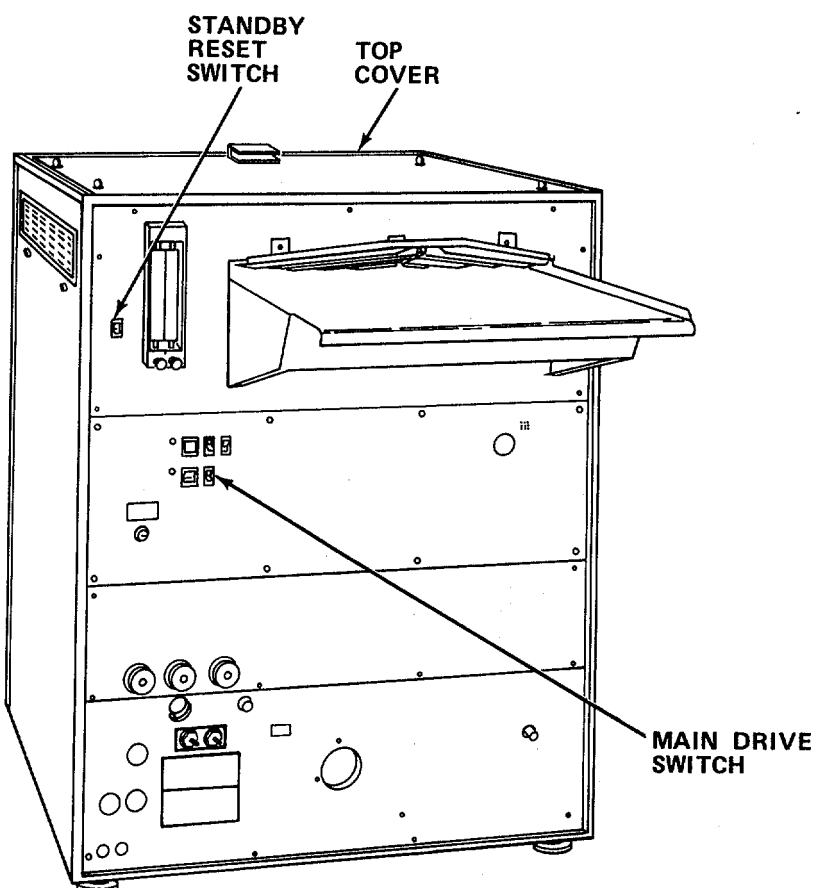
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
2	B	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Inspect Roller Drive System</u></p>  <p>Turn MAIN DRIVE switch ON and turn STANDBY RESET switch to OPERATING MODE. Remove top cover and manually press interlock drive switch. Observe roller rotation.</p>	Rollers are not rotating.

Table 5-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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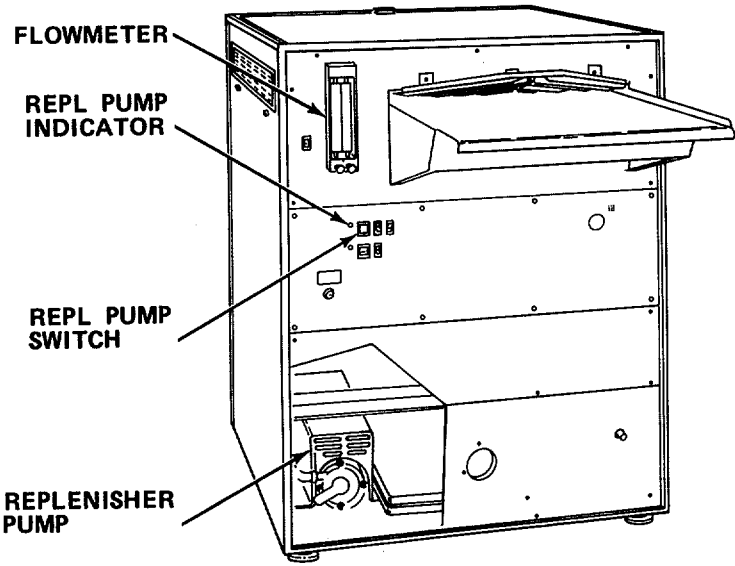
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
3	B	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Inspect Replenisher Pump Unit.</u></p>  <p>Press REPL PUMP switch to MANUAL position. Observe that REPL PUMP INDICATOR light is on. Listen for replenisher pump unit operation. Ensure flowmeter balls rise in their tubes.</p>	<p>Replenisher pump unit is not operating.</p>

Table 5-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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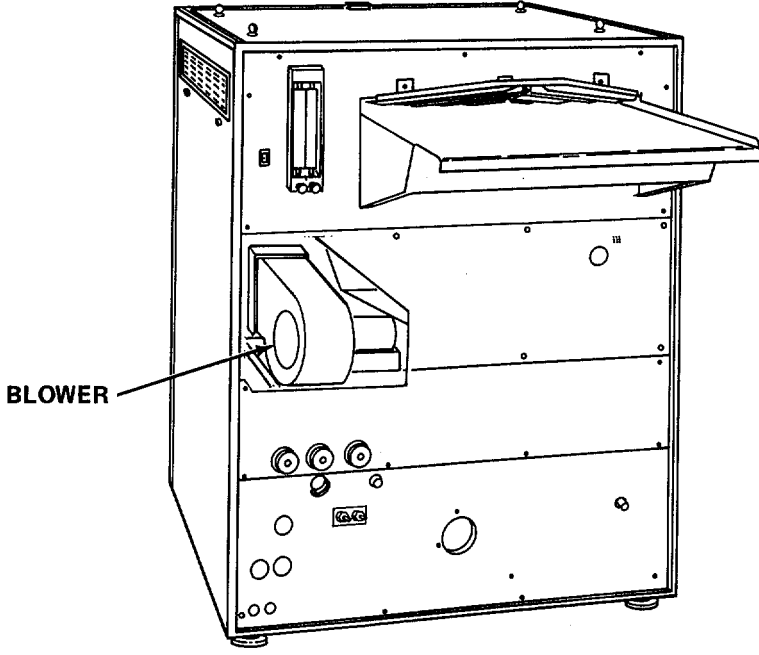
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
4	B	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Inspect Drying System.</u></p>  <p style="text-align: center;">INSPECT DRYING SYSTEM</p> <ol style="list-style-type: none"> 1. Turn MAIN DRIVE switch ON and press DRYER FAN switch on. 2. Check blower operation. 	<p>Blower does not operate.</p>

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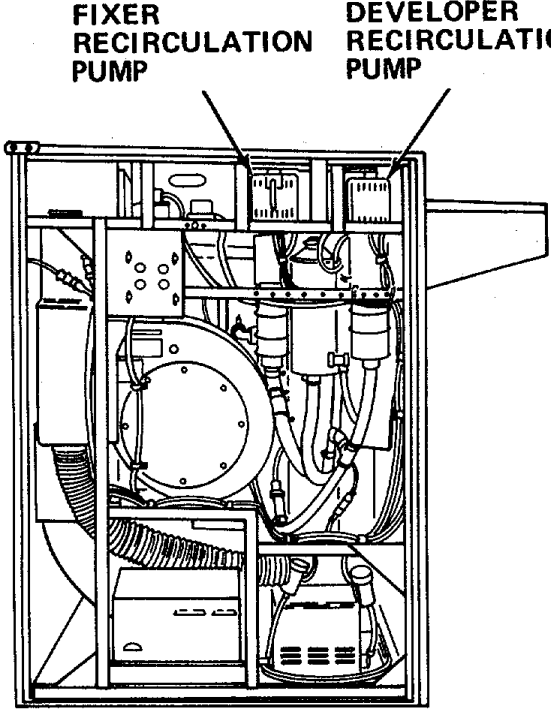
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
5	B	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Inspect Recirculation Pumps.</u></p> <div style="text-align: center;"> <p>FIXER RECIRCULATION PUMP DEVELOPER RECIRCULATION PUMP</p>  </div> <ol style="list-style-type: none"> 1. Remove left access panel. 2. Turn on MAIN DRIVE switch. 3. Turn on DRYER and DEV. HEAT switch. 4. Observe developer and fixer recirculation pumps for operation. 	<p>Developer or fixer recirculation pump inoperable.</p>

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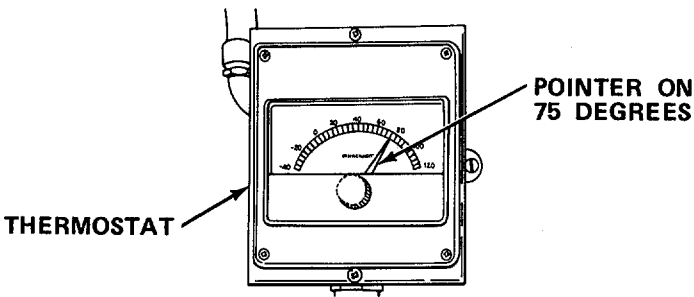
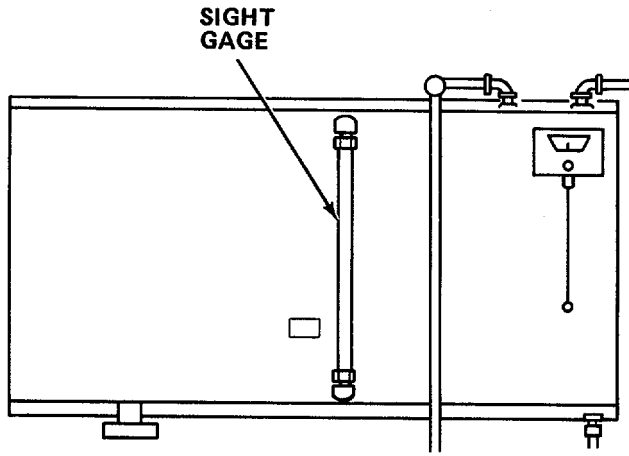
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
6	B	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Water Supply Temperature.</u></p>  <p>Check thermostat thermometer. Should read 75°F ± 2°F.</p>	Thermostat thermometer does not read 75°F ± 2°F.
7	B	<p><u>Water Level.</u></p>  <p>Check water level in recirculation and water tanks for full reading by observing level in sight gage. Top off tanks with-clean, fresh water.</p>	Water level is low.

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ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
8	B	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Inspect Tank Fittings.</u></p> <p>Check tank fittings for leaks. Refer to organizational maintenance.</p>	Leaks are observed.
9	B	<p><u>Service Recirculation and Water Tanks.</u></p> <div> <p>A line drawing of a semi-trailer. A thick black arrow points from the bottom of the trailer towards a specific fitting on the side of the tank area.</p> </div> <div> <p>A detailed diagram of a square tank fitting with a flange. Two hoses are connected to the fitting. The left hose is labeled 'INLET' and the right hose is labeled 'DRAIN'.</p> </div> <p>1. Connect water supply line to external fill inlet.</p>	

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ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
9	B	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Service Recirculation and Water Tanks - Cont</u></p> <p style="text-align: center;"><u>CAUTION</u></p> <p>Prior to disposal of recirculating fluid, field users should contact their local environmental coordinator, or their industrial hygienist for instructions on disposal of chemicals.</p> <ol style="list-style-type: none"> 2. Connect hose to external drain. 3. Top off water in recirculation tank. 4. Remove water supply line and drain hose. 5. Repeat above steps for storage tank. 	<p>Recirculation tank is not full.</p>

Table 5-1. 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

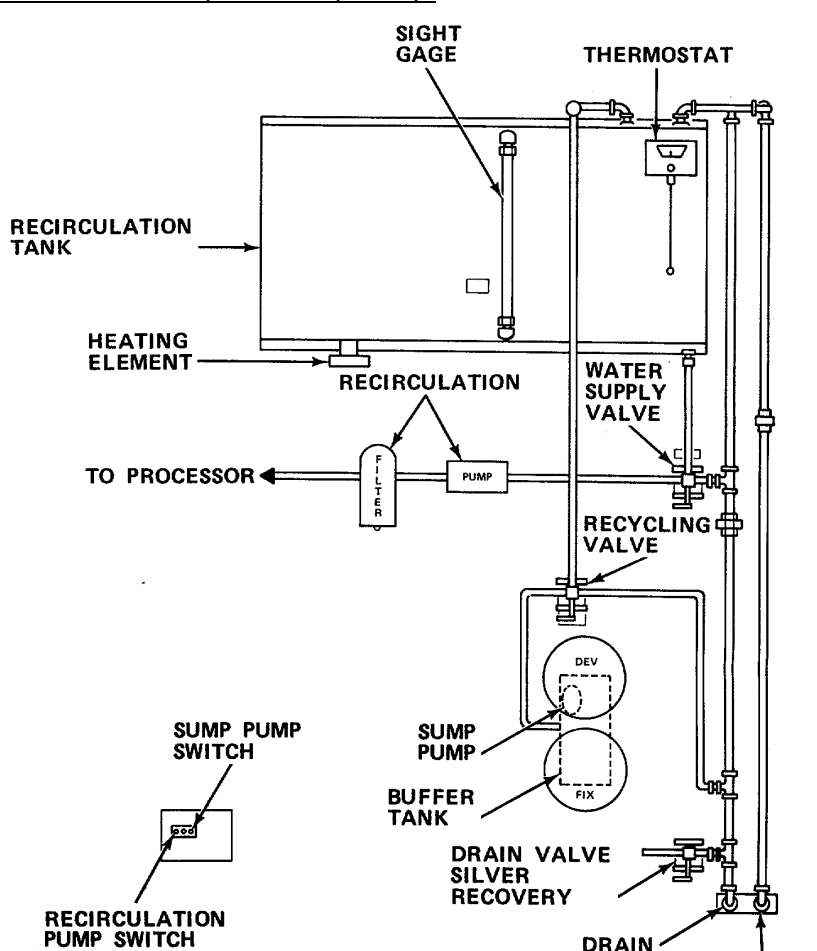
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
10	D	<p>FILM PROCESSOR - Cont</p> <p><u>Inspect Recirculation Pump and Sump Pump.</u></p>  <ol style="list-style-type: none"> 1. Turn on processor MAIN DRIVE switch. 2. Turn on RECIRC PUMP and SUMP PUMP switches. Recirculation pump should run. 	<p>Recirculation pump does not run.</p>

Table 5-1. 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:
10	D	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Inspect Recirculation Pump and Sump Pump - Cont</u></p> <p>3. Turn on water supply valve to supply water to recirculation pump.</p> <p>4. Sump pump should cycle on after processor fills.</p>	<p>Sump pump does not cycle on.</p>
11	A	<p><u>Inspect Transport System.</u></p> <p>Check that all film has exited processor.</p>	<p>Film is stuck in processor.</p>
12	W	<p><u>Service Transport System.</u></p> <div> </div> <p style="text-align: center;"><u>CAUTION</u></p> <ul style="list-style-type: none"> • Use splash guard when removing racks to prevent contamination. Lift racks slowly to prevent equipment damage. • When removing wash rack, exercise care that spray header is not damaged by improper handling. 	

Table 5-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
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(Number)-Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
12	W	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Service Transport System - Cont</u></p> <div> </div> <ol style="list-style-type: none"> 1. Remove top cover and all crossover assemblies. 2. Remove wash rack, fixer rack, and developer rack assemblies from processor. 3. Clean all assemblies and crossovers with sponge and warm water to remove chemical deposit buildup. 4. Inspect gears for broken or chipped teeth. 5. Be sure rollers turn freely. 6. Inspect all rollers for damage. 7. Clean all solution tanks with sponge and warm water to remove chemical deposits. 8. Reinstall rack assemblies in processor. Make sure that gears properly engage in worm drives. 	<p>Gears broken or teeth chipped.</p>

Table 5-1. 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:
12	W	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Service Transport System - Cont</u></p> <p>9. Reinstall all crossover assemblies and covers.</p>	
13	M	<p><u>Service Drying System.</u></p> <p>1. Remove rear panel.</p> <div style="text-align: center;"> <p>The diagram shows a cross-section of the drying system. At the top, there are two labels: 'TRANSPORT ROLLERS' pointing to a set of rollers and 'AIR TUBES' pointing to a set of horizontal tubes. Below the tubes, there are several vertical supports labeled 'NYLON SUPPORT BEARINGS'. The entire assembly is housed within a frame.</p> </div> <p style="text-align: center;"><u>CAUTION</u></p> <p style="text-align: center;">When removing or installing air tubes, ensure that wire fingers are not damaged.</p> <p>2. Remove six front air tubes by pressing each tube left against the spring-loaded stud and clearing tube from right side frame hole.</p> <p>3. Remove squeegee crossover assembly.</p>	

Table 5-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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(Number)-Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
13	M	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Service Drying System.</u></p> <div> </div> <ol style="list-style-type: none"> 4. Remove nine front rollers by lifting each roller from its support. 5. Rotate seven rear air tubes to allow removal of eight transport rollers. 6. Remove eight rear transport rollers. <p style="text-align: center;">NOTE All tubes must be removed from right side first before any tubes can be removed.</p>	

Table 5-1. 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**

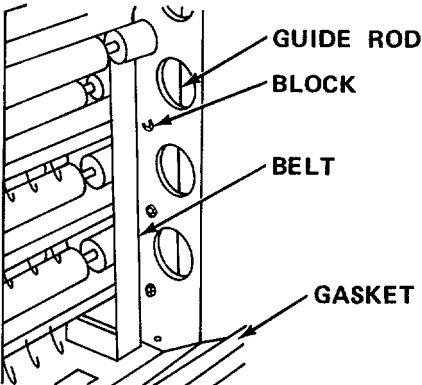
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
13	M	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Service Drying System - Cont</u></p> <ol style="list-style-type: none"> 7. Remove seven rear air tubes. 8. Clean rollers with sponge soaked in water. Dry rollers and shafts with cheesecloth. 9. Clean roller supports at each side of frame with cheesecloth. 10. Rinse air tubes with warm water. Air-dry tubes. <div style="text-align: center;">  <p>DRYER TRANSPORT PARTS</p> </div> <ol style="list-style-type: none"> 11. Reinstall rear air tubes. Do not align end slot with guide rod. 12. Reinstall eight rear transport rollers in their proper positions and rotate seven rear air tubes to locked position. 13. Reinstall front transport rollers in their proper positions. 	

Table 5-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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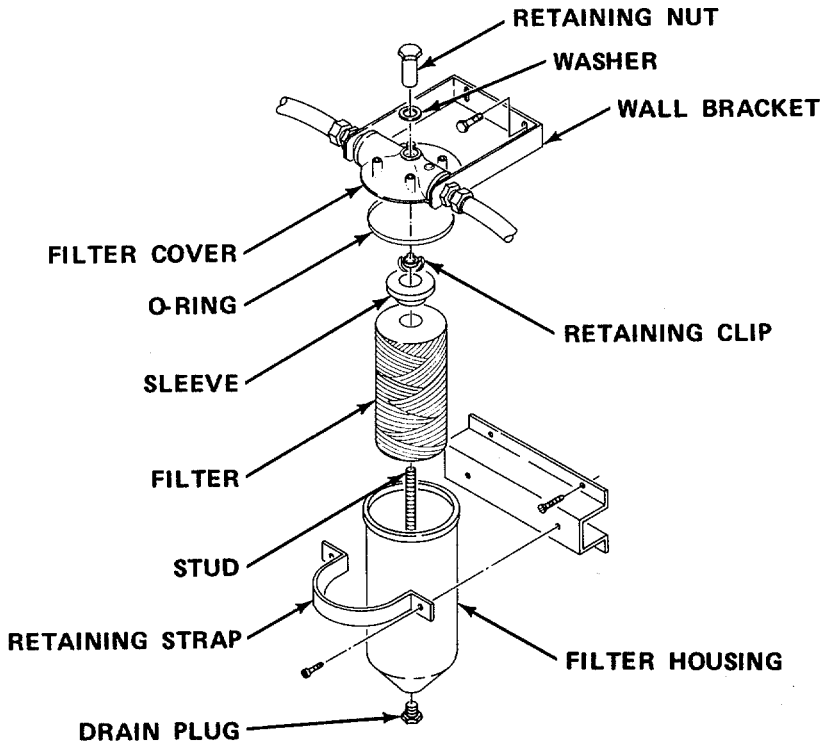
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
13	M	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Service Drying System - Cont</u></p> <p>14. Reinstall front air tubes with guide pins facing front transport rollers. Aline end slot with guide rod.</p> <p>15. Reinstall squeegee crossover assembly.</p> <p>16. Reinstall rear panel.</p>	
14	M	<p><u>Service Recirculation Filter.</u></p>  <p>1. Turn off water supply valve and place drain pan under filter housing.</p> <p>2. Remove plug in bottom of filter housing and drain filter.</p>	

Table 5-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
14	M	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Service Recirculation Filter - Cont</u></p> <ol style="list-style-type: none"> 3. Remove filter housing retaining strap. 4. Remove retaining nut and washer from cover. 5. Remove filter housing and 0-ring from cover. 6. Remove retaining clip. Remove sleeve and filter together from stud in filter housing. 7. Remove sleeve from filter. Discard filter. 8. Clean filter housing with fresh water. 9. Install sleeve into end of new filter. 10. Install filter and sleeve onto stud in filter housing. Secure with retaining clip. 11. Reinstall 0-ring and filter housing to cover. Retain with washer and retaining nut. 12. Reinstall filter housing retaining strap. 13. Reinstall drain plug into bottom of filter housing. 14. Open water supply valve. 	
15	M	<p><u>Service Processing Fluid System.</u></p> <ol style="list-style-type: none"> 1. Replace developer filter (paragraph 5-10.1). 2. Service strainers (paragraph 5-10.2). 	<p>Filter clogged.</p> <p>Strainers clogged.</p>

Table 5-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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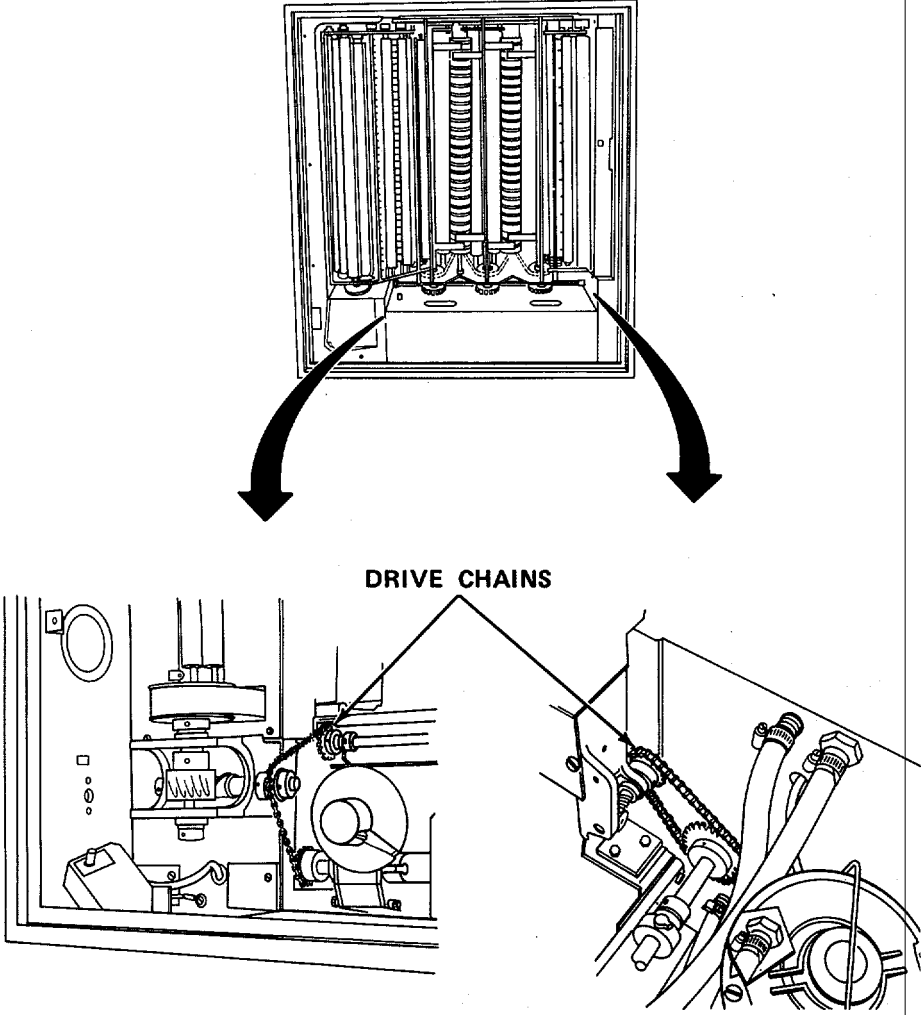
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
16	M	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Inspect Drive Chains.</u></p>  <p>Inspect chains for damage.</p>	<p>Drive chains damaged.</p>

Table 5-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
17	M	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Inspect Drive Gears.</u></p> <div style="text-align: center;"> <p>DRIVE GEARS</p> </div> <p>Check drive gears for damage.</p>	Drive gears damaged.
18	M	<p><u>Inspect Flowmeters.</u></p> <ol style="list-style-type: none"> 1. Inspect flowmeters for visible damage and obstructions. 2. Inspect flowmeters for visibility of graduations. Clean glass shield with cheesecloth and mild detergent solution. 	

Table 5-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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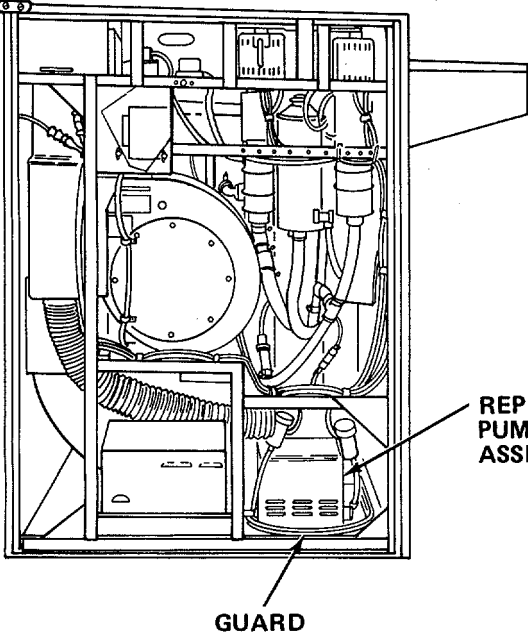
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
19	Q	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Inspect Flowmeters and Check Flow Rates.</u></p> <p style="text-align: center;">NOTE</p> <p>A flowmeter chart must be created at initial startup for both flowmeters. After you have established the flow rates and constructed the chart, you should retain data for future use.</p>  <p style="text-align: center;">REPLENISH PUMP/MOTOR ASSEMBLY</p> <p style="text-align: center;">GUARD</p> <ol style="list-style-type: none"> 1. Remove left access panel. 2. Remove guard over replenisher pump. 	

Table 5-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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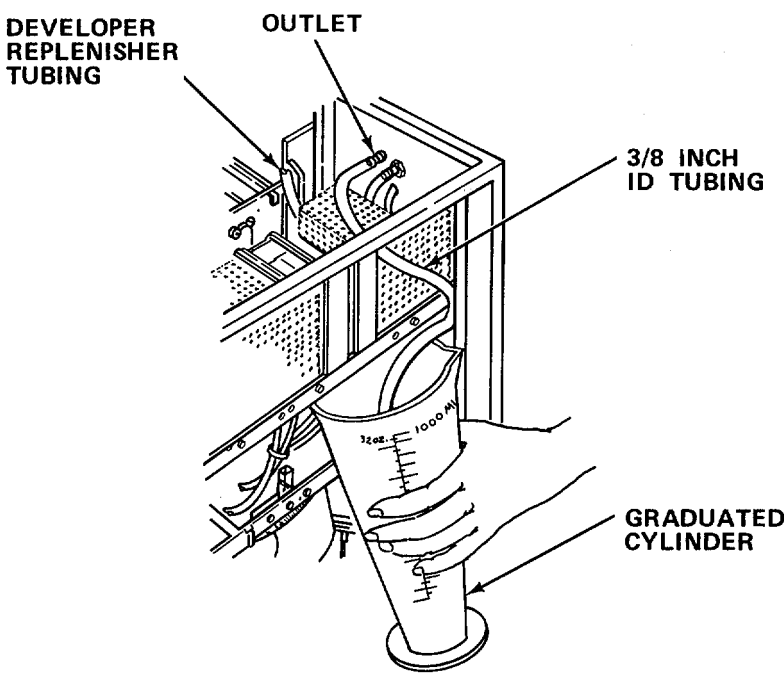
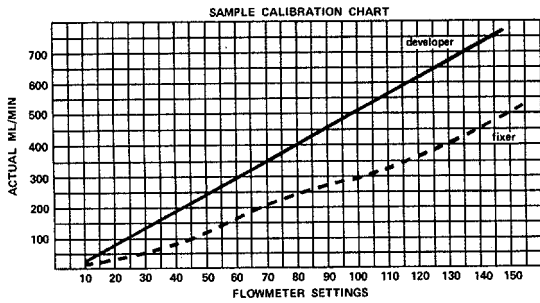
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
19	Q	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Inspect Flowmeters and Check Flow Rates - Cont</u></p>  <p>3. Disconnect developer replenisher tubing from outlet of flowmeter and fasten this tube to processor so that open end is above solution level in tank, as shown.</p> <p>4. Attach a 5 ft (1.5 m) piece of 3/8 in. (9.53 mm) ID tubing to outlet of flowmeter. Put end of tube in graduated cylinder. Turn on replenisher pump (REPL PUMP switch to MANUAL) momentarily to remove any air from line.</p> <p style="text-align: center;">NOTE</p> <p>Always use the center of the flowmeter ball as a reference point.</p>	

Table 5-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before **W - Weekly** **AN - Annually** **(Number) - Hundreds of Hours**
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ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:																				
19	Q	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Inspect Flowmeters and Check Flow Rates.- Cont</u></p> <p>5. Turn on replenisher pump for 1 minute. With a 1 qt (1000 ml) graduated cylinder, measure amount of developer pumped for one minute at each of the following flowmeter settings: 10, 40, 70, 100, and 130.</p> <p>6. Tabulate data as shown below:</p> <p style="text-align: center;"><u>Sample Characteristic Chart</u></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Flowmeter Setting</th> <th colspan="2">Replenishment Rate (ml/min)</th> </tr> <tr> <th>Fixer</th> <th>Developer</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>30</td> <td>30</td> </tr> <tr> <td>40</td> <td>95</td> <td>190</td> </tr> <tr> <td>70</td> <td>215</td> <td>350</td> </tr> <tr> <td>100</td> <td>300</td> <td>520</td> </tr> <tr> <td>130</td> <td>415</td> <td>670</td> </tr> </tbody> </table> <p>7. Repeat this procedure for fixer flowmeter. Reconnect original replenisher tubing.</p> <div style="text-align: center;">  <p style="font-size: small;">SAMPLE CALIBRATION CHART</p> </div> <p>8. With your data gathered, construct a simple flowmeter chart. See sample for guidance.</p>	Flowmeter Setting	Replenishment Rate (ml/min)		Fixer	Developer	10	30	30	40	95	190	70	215	350	100	300	520	130	415	670	
Flowmeter Setting	Replenishment Rate (ml/min)																						
	Fixer	Developer																					
10	30	30																					
40	95	190																					
70	215	350																					
100	300	520																					
130	415	670																					

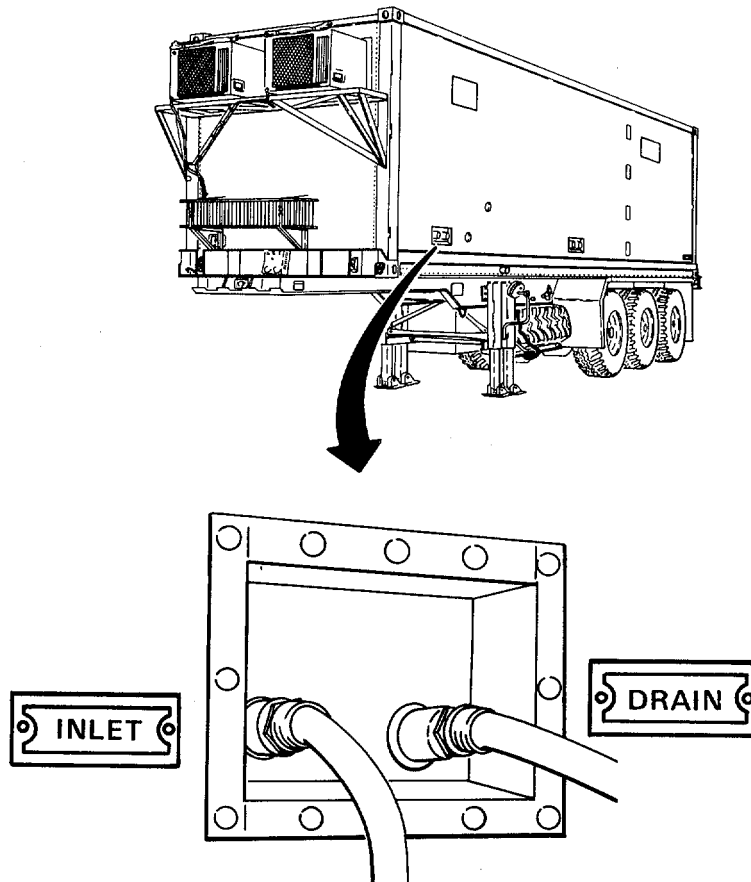
5-6. OPERATION UNDER USUAL CONDITIONS.

5-6.1 Assembly and Preparation for Use.

NOTE

The following procedures assume that the processor has been properly installed; replenisher tanks are installed; racks and crossovers are not installed; and top cover is off.

- a. Perform before operation (B) PMCS (Table 5-1).

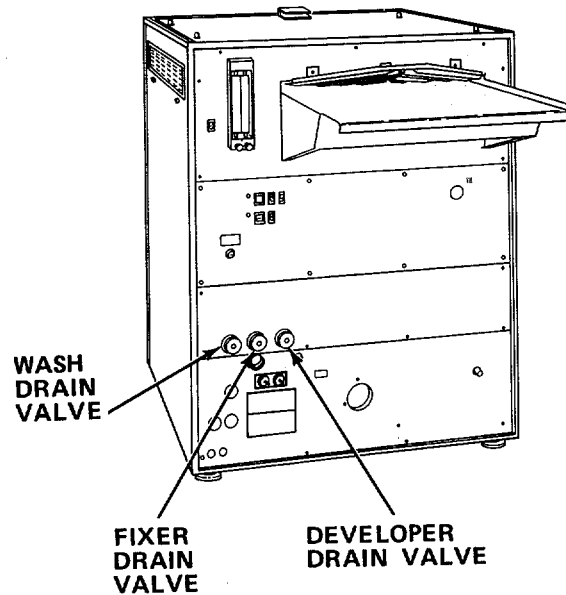


- b. Connect water supply line to external fill inlet of recirculation tank.
- c. Connect hose to external drain.
- d. Close drain valve and top off water in recirculation tank.
- e. Remove water supply line and drain hose.

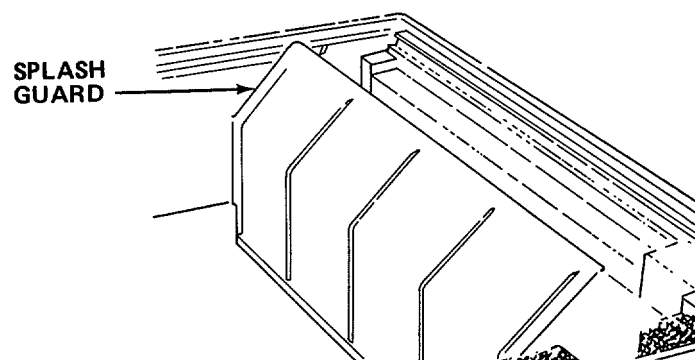
CAUTION

Prior to disposal of recirculation fluid, field users should contact their local environmental coordinator, or their industrial hygienist for instructions on disposal of chemicals.

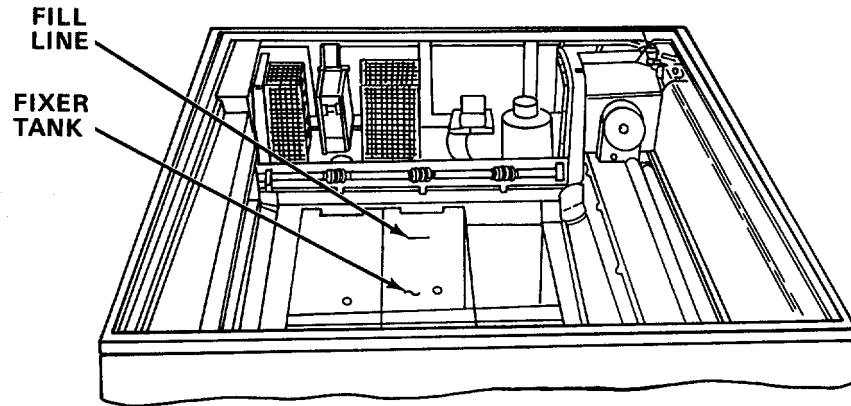
- f. Repeat steps 1 through 4 for supply tank.
- g. Remove left access panel from processor.
- h. Make sure that processor solution tanks and fixer and developer replenishment tanks are clean.



- i. Close three drain valves on processor.
- j. Mix fixer in 5 gal. stainless steel bucket according to instructions on package.



- k. Place large splash guard between developer and fixer tanks.



NOTE

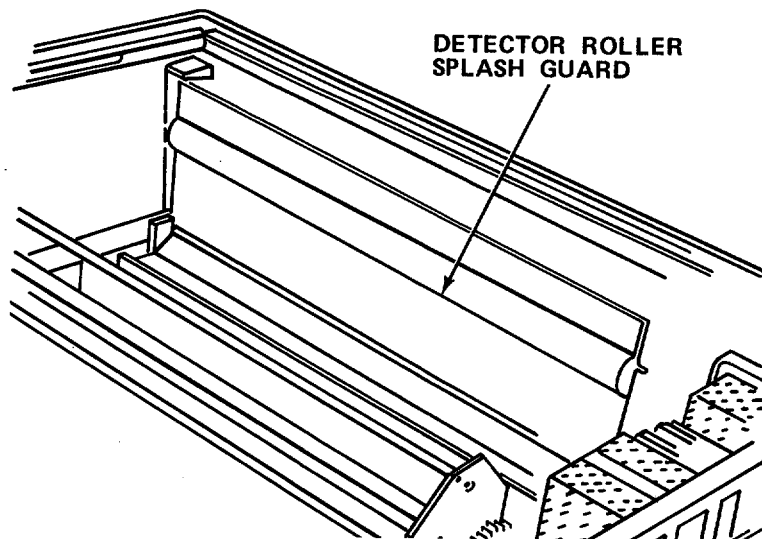
Be sure fixer solution does not splash. Fixer will contaminate developer.

- l. Fill fixer tank in processor to fill line with fixer solution.
- m. Fill fixer storage tank with 7 gal. (26.5 l) of fixer.

WARNING

You should use two people to lower each rack into its respective tank to reduce the chance of injury to personnel and/or damage to equipment.

- n. Make sure that all racks are clean. Slowly lower fixer rack into fixer tank.



- o. Remove and clean splash guard. Put detector roller splash guard over detector rollers.

CAUTION

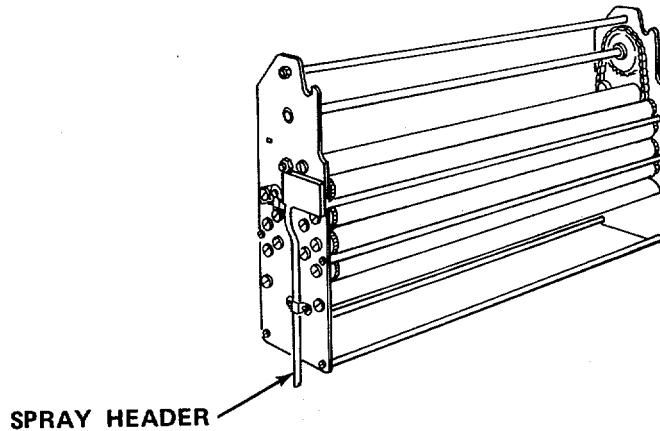
If any fixer splashes into the developer tank, you must thoroughly rinse and clean it. Very small amounts of fixer can seriously contaminate the developer.

- p. Mix developer in 5 gal. stainless steel bucket according to instructions on package.

CAUTION

Do not mix powder developers in the developer tank or damage may result. You can, however, mix liquid developers in the tank.

- q. Fill developer tank in processor with 12 gal. (45 l) of developer.
 r. Fill developer replenishment tank with 7 gal. (26.5 l) of developer.
 s. Using winch, slowly lower developer rack into its tank.



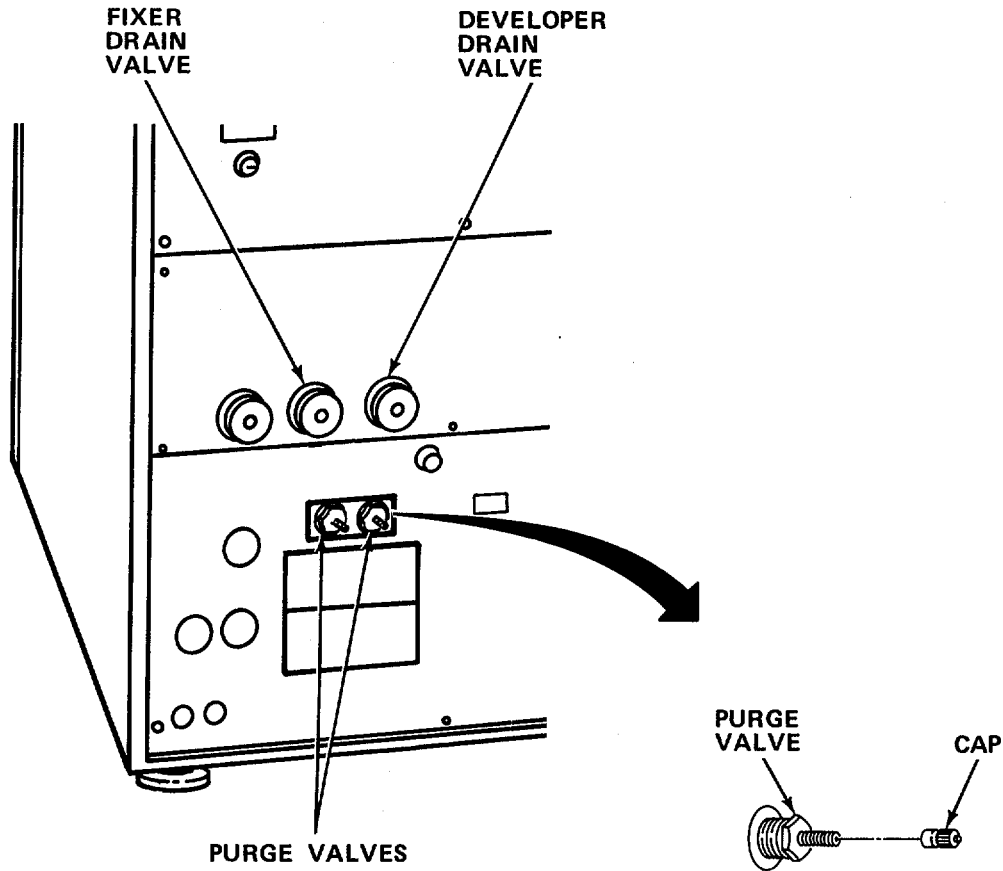
- t. Lower wash rack into its tank. Make sure spray header is seated in hole in bottom of tank.
 u. Make sure that all racks are seated properly.

WARNING

Death or serious injury may occur from electrical shock unless replenisher pump power cord is tied to overhead brace, away from strainers.

- v. Tie replenisher pump power cord to overhead brace to prevent solution from dripping on it.

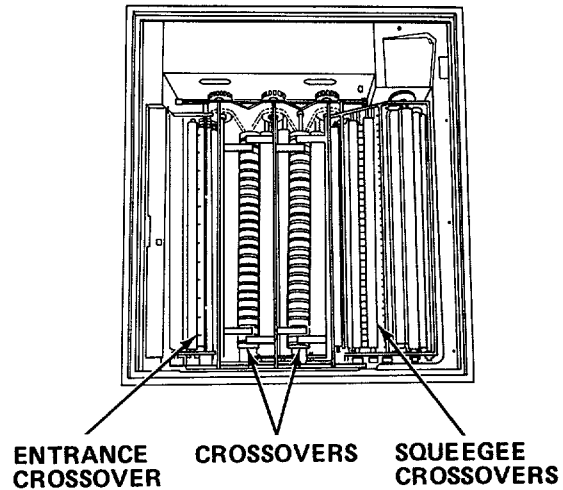
- w. Turn processor circuit breaker ON.
- x. Turn REPL PUMP switch to MAN.
- y. Open flowmeter control valves.



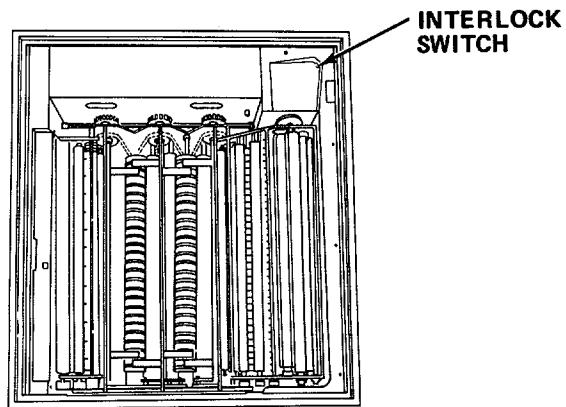
NOTE

Do not remove caps from strainers.

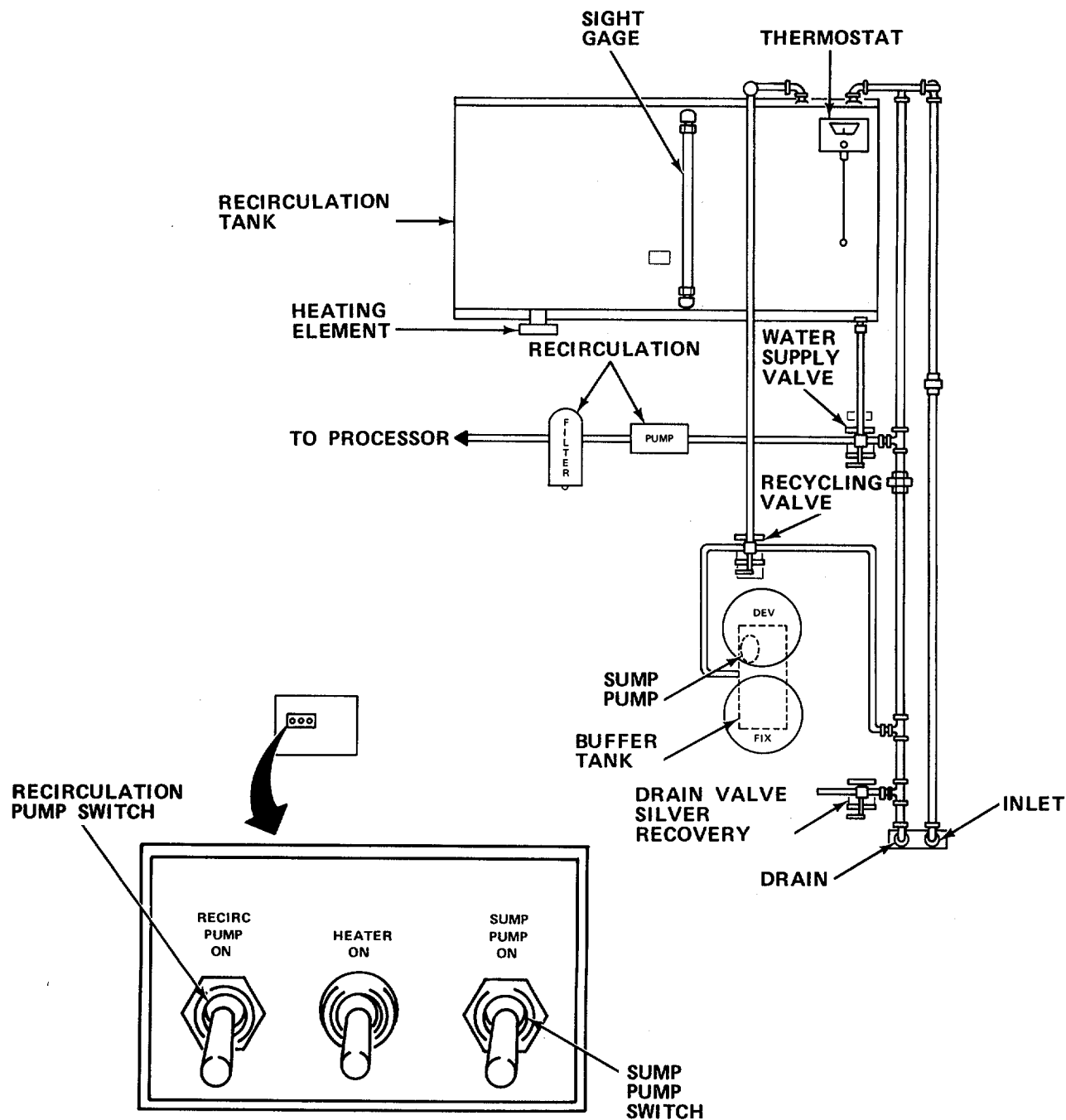
- z. Remove cap from purge valve and press valve stem until liquid seeps out. This will purge air from system.
- aa. Turn OFF REPL PUMP switch. Clean up any spilled solution.
- ab. Remove, clean, and reinstall detector roller splash guard.



- ac. Install all crossovers. Make sure they are seated properly.
- ad. Reinstall left access panel.
- ae. Turn on all switches on front panel.
- af. Plug chiller into processor ACCY outlet.
- ag. Set TRANSPORT SPEED control knob to desired setting.



- ah. Manually press interlock switch and observe transport system for proper roller operation.
- ai. Reinstall top cover.



- aj. Turn on water supply to recirculation pump by opening recirculation tank water supply valve.
- ak. Turn on RECIRC PUMP, HEATER, and SUMP PUMP switches.
- al. Set recirculation tank thermostat to 75°F (23.8°C).
- am. Check all plumbing connections for leaks.
- an. Set DRYER THERMOSTAT at desired temperature.

CAUTION

Cleanup sheets should be made from 20 in. x 24 in. x 0.004 in. (50.8 cm x 61 cm x 0.10 mm) clean, processed, lithographic film. Do not use continuous-tone films or processor solutions will be contaminated. The first few cleanup sheets will come through dirty. This is dirt pickup from the rollers and should disappear as more sheets are fed through the processor. Discard all cleanup sheets after 30 days and make new ones.

- ao. With flowmeter control valves open slightly, feed several cleanup sheets, emulsion side up, into processor. Make sure cleanup sheets transport properly through processor. Make sure flowmeter balls rise in their tubes, indicating that replenisher pump is working.

NOTE

A flowmeter chart must be created at initial startup for both flowmeters. Refer to operator PMCS (Table 5-1) for instructions on creating flowmeter chart. After you have established the flow rates and constructed the chart, you should retain data for future use.

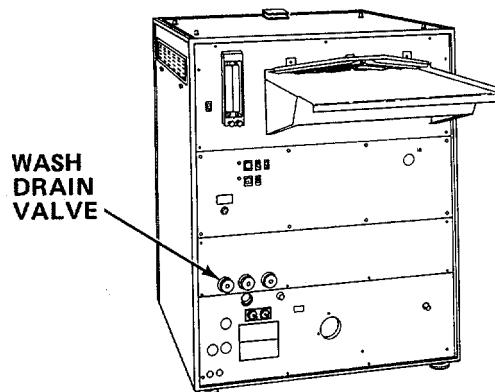
- ap. Set flowmeter control valves to desired replenishment rate.

5-6.2 Operating Procedures.

- a. Daily startup.

NOTE

If limited quantities of film are to be developed, the processor may be used in manual mode to prevent contamination of the recirculation tank water. This is accomplished by turning the RECYCLING valve to drain position and turning the WATER SUPPLY valve OFF.



- (1) Close processor wash drain valve.
- (2) Turn RECYCLING valve to tank position.
- (3) Turn on water supply to processor at WATER SUPPLY valve.
- (4) Set recirculation tank thermostat to 750F, if necessary.
- (5) Replace top cover to actuate safety interlock switch.
- (6) Turn ON processor circuit breaker.
- (7) Turn on all switches on front control panel of processor.

CAUTION

The HEATER and SUMP PUMP switches must be ON during manual or automatic modes of operation. The RECYCLING valve must never be off during operation, or processor will overflow. The RECIRC PUMP must be ON during automatic mode, and OFF during manual mode of operation.

- (8) Turn ON HEATER and SUMP PUMP switches.
- (9) If selecting manual mode, turn RECYCLING valve to drain position and turn WATER SUPPLY valve and RECIRC PUMP off.
- (10) Feed cleanup sheets through processor to clean rollers and to make sure replenishment system is operating.
- (11) Check operation of racks, squeegee assembly, and dryer transport. Check crossover mountings.

NOTE

Processor should be at desired temperature in about 20 minutes, depending on starting water temperature.

- (12) Check that developer temperature indicator light flashes slowly on and off to indicate developer is at proper temperature.
- (13) Set DRYER TEMPERATURE control to lowest setting consistent with good drying characteristics.
- (14) Check transport speed.
- (15) Process and evaluate appropriate control strip.
- (16) Begin processing material, emulsion side up.

b. Daily shutdown.

- (1) Perform after operation (A) PMCS (Table 5-1).
- (2) Make sure that processor has been cleared of film.

NOTE

The wash tank should be drained each night to minimize bacterial growth.

- (3) Turn off recirculation tank WATER SUPPLY valve and open processor wash drain valve.
 - (4) Turn off all switches on processor control panel.
 - (5) If recirculation tank is to be drained, turn WATER SUPPLY valve to DRAIN position.
 - (6) Leave top cover of processor open approximately 4 in. (10 cm) so that chemical-laden fumes from processing tanks can escape.
 - (7) Turn off circuit breaker.
- c. Drain processor.

- (1) Shut down processor (paragraph 5-6.2b).
- (2) Remove all crossover assemblies and the squeegee assembly.

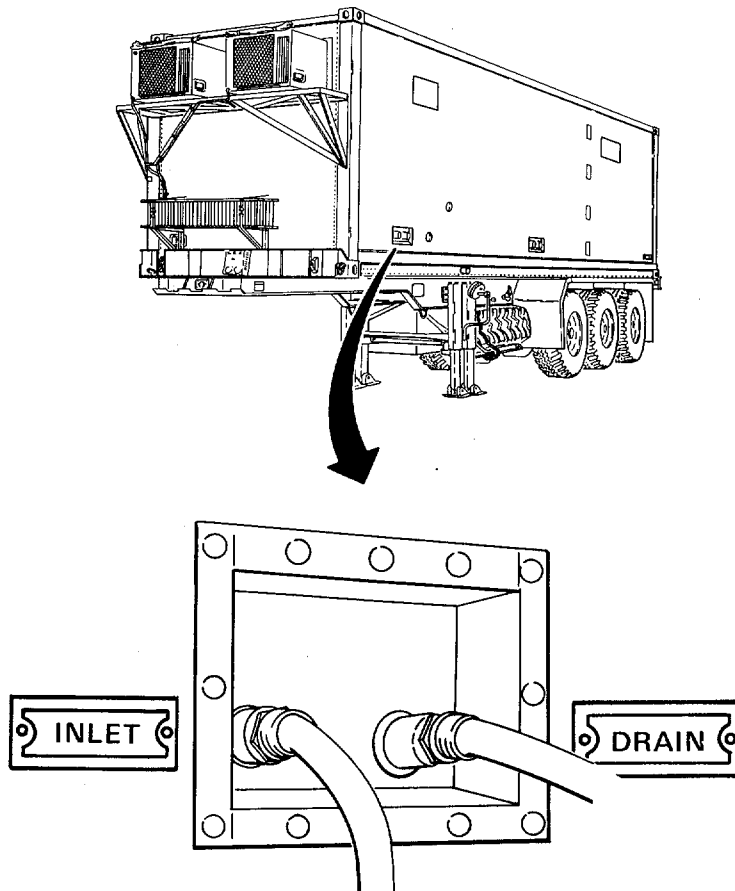
NOTE

Do not immerse squeegee assembly in water.

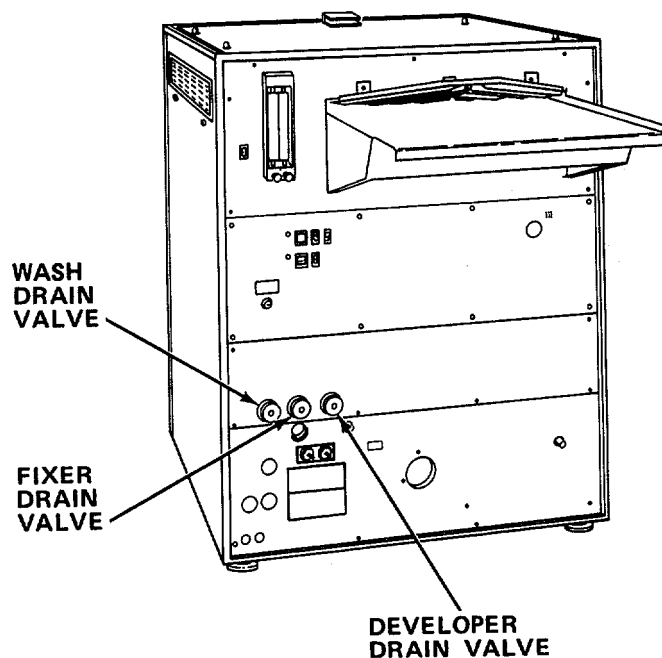
- (3) Rinse with warm water and use a sponge to remove any deposits that have formed.
- (4) Remove developer, fixer, and wash racks.
- (5) Rinse with warm water and wipe with a damp sponge.

CAUTION

Prior to disposal of recirculating water, developer, and fixer, field users should contact their local environmental coordinator, or their local industrial hygienist for instructions on disposal of solution;.



- (6) Connect drain hose to external drain connection.
- (7) Rotate RECYCLING valve to drain position.



CAUTION

To prevent flooding and/or damage to sump pump, open only one drain valve at a time.

- (8) Open DEV drain valve.
- (9) Open FIXER drain valve.
- (10) Open WASH drain valve.
- (11) When tanks are drained, rinse tanks with warm water.
- (12) After racks, squeegee assembly, and crossovers have drained, store racks, squeegee assembly and crossovers in their appropriate wall racks until tanks are refilled.
- (13) Shut DEV, FIXER, and WASH drain valves.
- (14) Turn RECIRC PUMP, HEATER, and SUMP PUMP switches OFF.
- (15) Turn RECYCLING and WATER SUPPLY valves to OFF positions.

5-6.3 Preparation for Movement.

- a. Perform processor shutdown (paragraph 5-6.2b).
- b. Perform drain processor procedure (paragraph 5-6.2c).

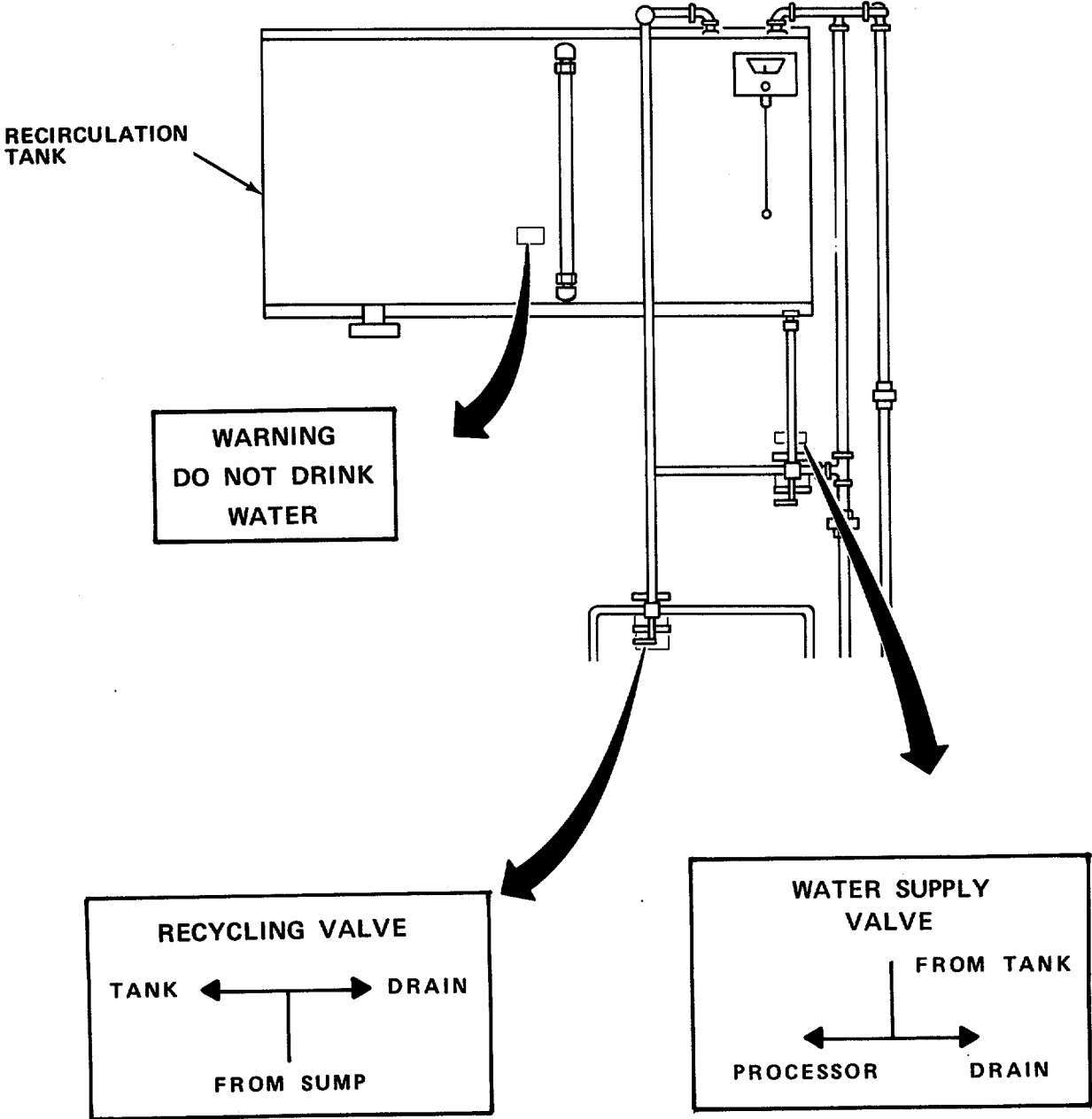
- c. Unplug and drain chiller by connecting drain hose to quick-disconnect fitting.
- d. Drain fixer and developer replenisher tanks.
- e. Turn off RECIRC PUMP, HEATER, and SUMP PUMP switches.
- f. Check to be sure all water has been drained from recirculation tank.

NOTE

For the following steps, use the Model 34-2025 Air Compressor or equivalent. (Maximum output 30 psi.)

- g. Open the flow rate control valves on the flowmeter to the fully open position.
- h. Use the purge valves located on the front panel of the processor, connect the air compressor, blow remaining liquids from lines.
- i. Wipe liquid from processor tanks with dry rags.
- j. Drain the buffer tank by connecting drain hose to the quick-disconnect fitting.
- k. Check to be sure all processor switches are in the OFF position.
- l. Check to be sure all processor panels and covers are installed and fastened.

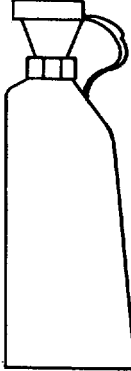
5-6.4 Operating Instructions on Decals and Instruction Plates.



EMERGENCY EYE WASH STATION

Slight Chemical Burns :
Draw eyelids apart with thumb and index finger. Bend over bottle and press eye-cup gently against eye socket. Keeping eye open, rinse thoroughly by repeatedly squeezing wall of bottle.

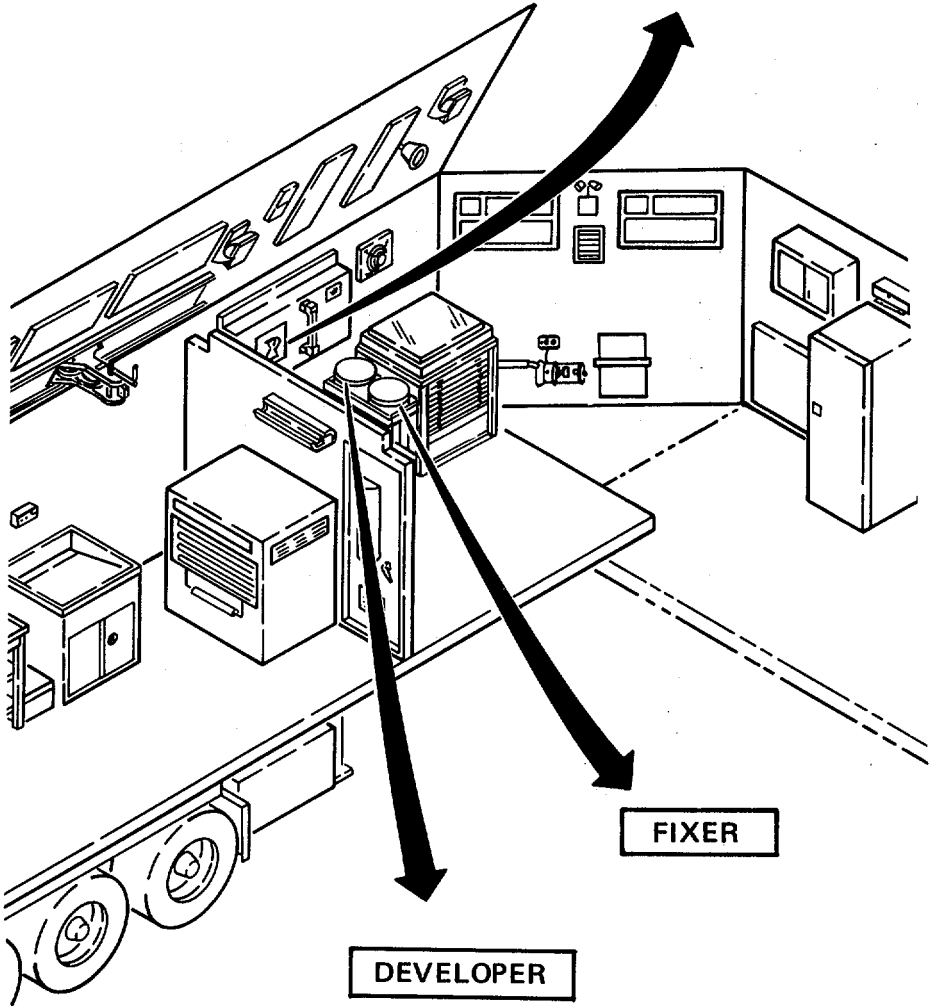
Severe Chemical Burns :
Eyelids shut reflexly, nearest person should give following assistance :
Standing or Sitting : Helper opens eyelid with thumb and index finger. Hold eye-cup 3 to 4 inches from eye, so effect can be seen. Rinse thoroughly by squeezing bottle.



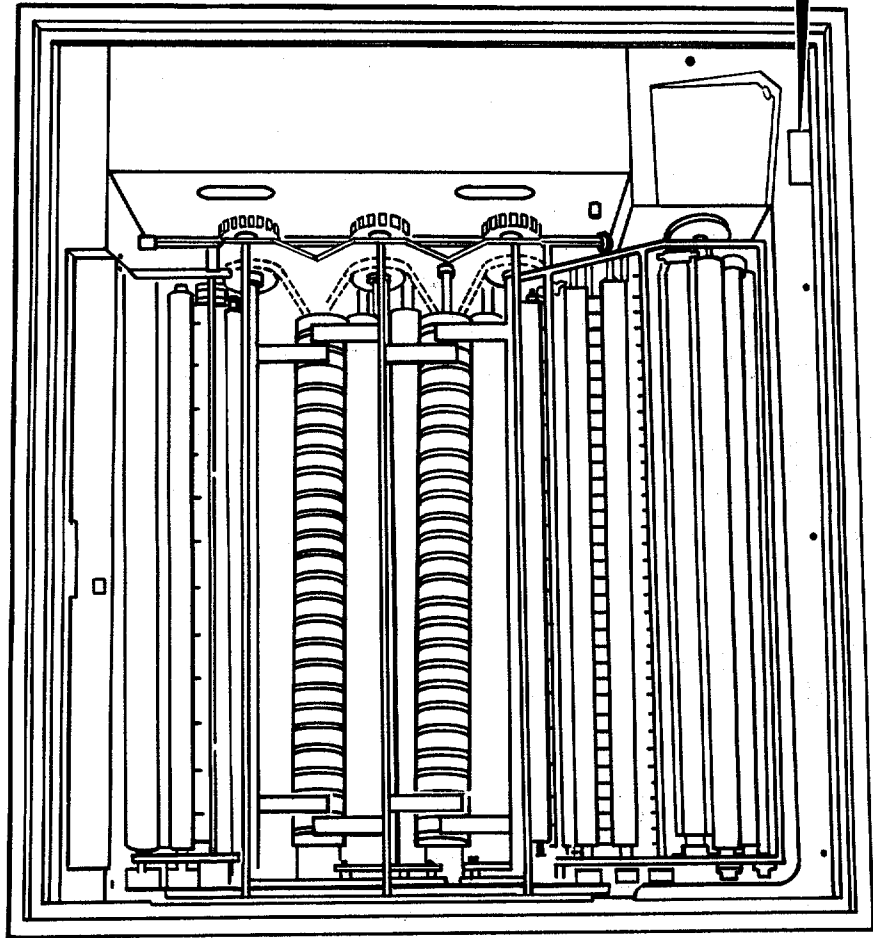
Lying Down : Helper must unscrew top of bottle, pull out hose in bottle. Screw top on. Rinse thoroughly, same as in standing position, with eye-cup 3 to 4 inches from eye.

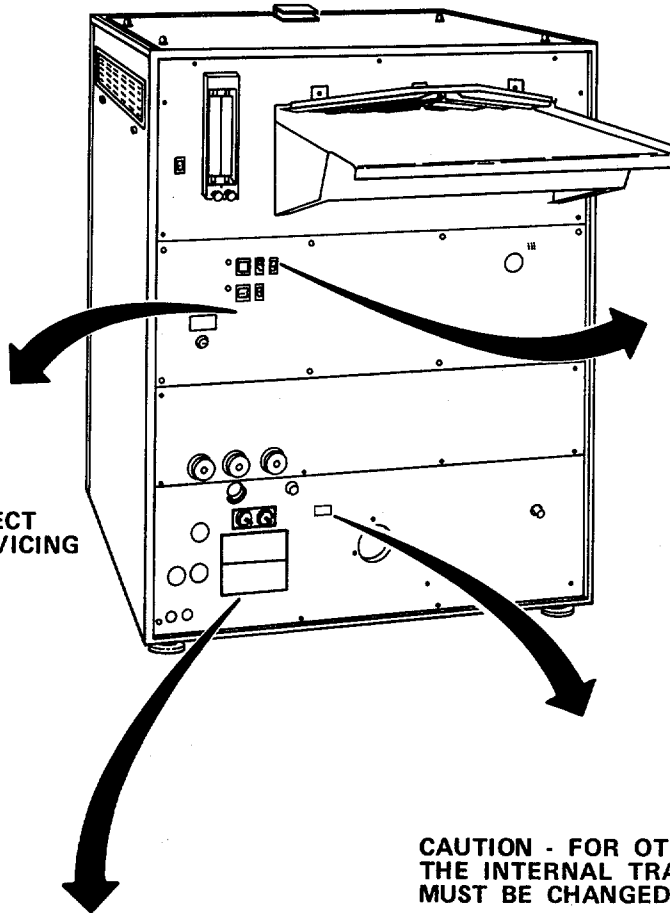
Be sure to rinse upper lid every time.

BARIKOS
Perma Distributing
Div. of Grand Rapids
Fabricators, Inc.
Grand Rapids, Mi.
49503



IMPORTANT
AT SHUTDOWN
LEAVE COVER OPEN
APPROX. 2 INCHES





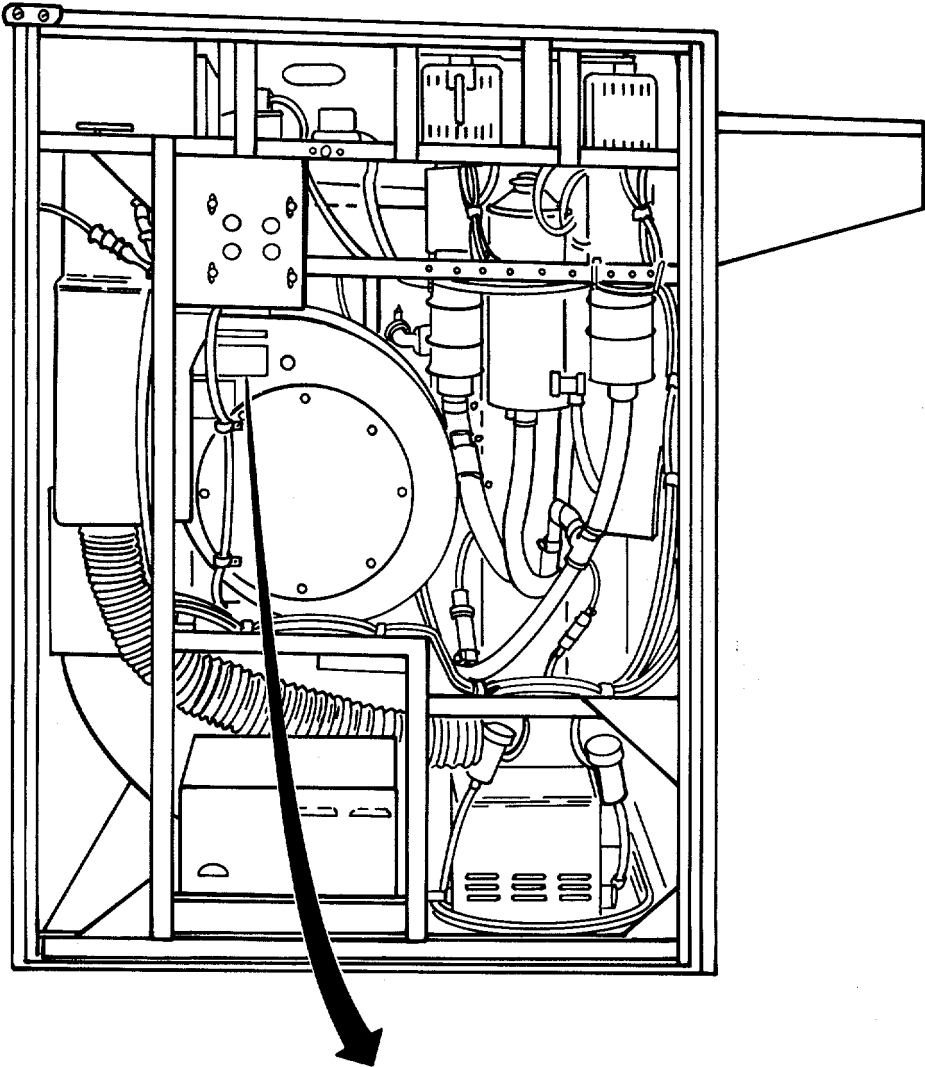
**CAUTION - DISCONNECT
POWER BEFORE SERVICING**

← **WHEN TANK IS EMPTY
OR DRAINING THIS
SWITCH MUST BE OFF**

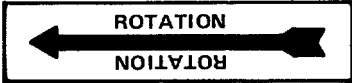
**CAUTION - FOR OTHER ELECTRICAL SERVICES
THE INTERNAL TRANSFORMER CONNECTIONS
MUST BE CHANGED.**

<p>CAUTION</p> <p>PRIOR TO EXPOSING TO FREEZING TEMPERATURES, PURGE DEVELOPER AND FIXER REPLENISHMENT LINES USING SUPPLIED AIR COMPRESSOR</p>
<p>CAUTION</p> <p>TO PREVENT CONTAMINATION AND EXCESSIVE SPLATTER, DRAIN ALL TANKS COMPLETELY BEFORE APPLYING AIR PRESSURE. WEAR SAFETY GOGGLES.</p>

<p>CAUTION</p> <p>INSTALL LEVELING FEET AND LEVEL PROCESSOR BEFORE CONNECTING UTILITIES</p>
--

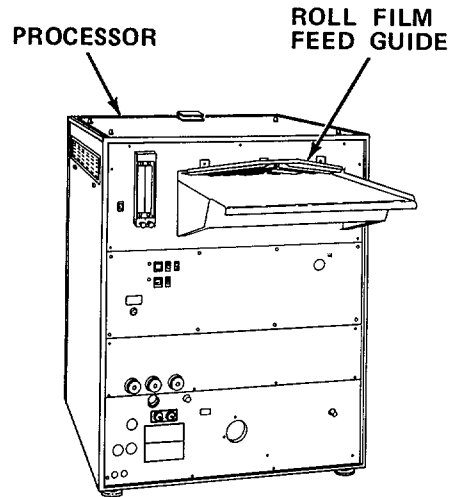


WARNING
DO NOT OPERATE
THIS BLOWER ON
FREE AIR DELIVERY
AS MOTOR WILL
BE OVERLOADED
BSE 1969



5-7. OPERATION UNDER UNUSUAL CONDITIONS.

5-7.1 Roll Film Feeding. To feed roll film into processor, proceed as follows:



- a. Tuck leading edge of film under center rail of roll film feed guide. This operation is required, regardless of film width.
- b. Gently push film forward in a straight line until it enters detector rollers.

5-7.2 Operation in Cold Weather.

- a. When van body heaters are not operating, or when the van body is being transported, liquid consumable supplies may freeze, break their containers, then melt and ruin equipment or documents.
- b. Drain water tank and recirculation tank any time the van body heaters are inoperable or a power loss is expected, to prevent damage from freezing.

5-7.3 Operating in Extreme Heat. The operation of the processor 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.

5-7.4 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 van body.

5-7.5 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 van body. Air filters will be changed whenever airflow is restricted, and cleaning of van body interior must be conducted more frequently than specified by PMCS schedules.

Section III. OPERATOR'S MAINTENANCE INSTRUCTIONS**5-8. LUBRICATION INSTRUCTIONS.****WARNING**

Serious injury may occur if fingers, clothing, or other materials are caught in moving parts.

CAUTION

Do not get oil or grease on the racks or crossovers, or in the solution tanks. Damage to equipment or contamination may occur.

NOTE

These lubrication instructions are mandatory.

5-8.1 Drive Chains.

- a. Detector roller. Apply a small amount of ball and roller bearing grease (Item 23, Appendix E) to the surface of chains once a month.
- b. Main drive. Apply to the surface of main drive chains a small amount of ball and roller bearing grease (Item 23, Appendix E) once a month.

5-8.2 Worm Drive Gears.

- a. Detector roller drive. Semiannually, apply a small amount of ball and roller bearing grease (Item 23, Appendix E) to surface of gear teeth.
- b. Dryer drive. Semiannually, apply a small amount of ball and roller bearing grease (Item 23, Appendix E) to surface of gear teeth.

5-8.3 Main Drive Shaft Bearings. Semiannually, apply four to five drops of light oil (S.A.E. 10 motor oil) (Item 32, Appendix E) into oil cups on top of bearing housings.

5-8.4 Developer and Fixer Recirculation Pump Motors. Semiannually, apply several drops of light oil (S.A.E. 10 motor oil) (Item 32, Appendix E) on top and bottom motor bearings.

5-8.5 Replenisher Pumo Motor. Semiannually, apply several drops of light oil (S.A.E. 10 motor oil) (Item 32, Appendix E) into both oil wells.

5-8.6 Oilite Bearings.

- a. Dryer drive shafts (4). Semiannually, apply one to three drops of light oil (S.A.E. 10 motor oil) (Item 32, Appendix E) on shafts at bearings.
- b. End of detector rollers (4). Semiannually, apply one to three drops of light oil (S.A.E. 10 motor oil) (Item 32, Appendix E) on shafts at bearings.
- c. Dryer bottom pulley bearing (1). Semiannually, apply one to three drops of light oil (S.A.E. 10 motor oil) (Item 32, Appendix E) on shaft bearing.

5-9. TROUBLESHOOTING PROCEDURES.

a. This table lists the common malfunctions which you may find during operation or maintenance of the film processor. You should perform the test/inspections and corrective actions in the order listed.

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.

Table 5-2. TROUBLESHOOTING

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

1. ROLLERS DO NOT ROTATE WHEN DRIVE SWITCH IS TURNED ON.

Step 1. Check that circuit breaker is ON.

- (a) If circuit breaker is ON, proceed to step 2.
- (b) If circuit breaker is OFF, turn on circuit breaker.

Step 2. Check interlock drive switch for activation.

- (a) If interlock drive switch is activated, proceed to step 3.
- (b) If interlock drive switch is not activated, activate interlock drive switch.

Step 3. Check TRANSPORT SPEED control setting.

- (a) If TRANSPORT SPEED control setting is correct, proceed to step 4.
- (b) If TRANSPORT SPEED control setting is too low, rotate TRANSPORT SPEED control knob to the right.

Table 5-2. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

1. ROLLERS DO NOT ROTATE WHEN DRIVE SWITCH IS TURNED ON - Cont

Step 4. Check that toothed gears on rack assemblies are properly meshed.

- (a) If gears are aligned correctly, proceed to step 5.
- (b) If gears are misaligned, reposition rack assemblies.

Step 5. Check that drive chain is properly positioned.

- (a) If drive chain is misaligned, reposition drive chain.
- (b) If malfunction persists, refer to organizational maintenance.

2. DRYER FAN DOES NOT BLOW AIR.

Step 1. Check that DRYER and DEV. HEAT switch is ON.

- (a) If DRYER and DEV. HEAT switch is ON, proceed to step 2.
- (b) If DRYER and DEV. HEAT switch is OFF, turn on switch.

Step 2. Check for clogged air intake filter.

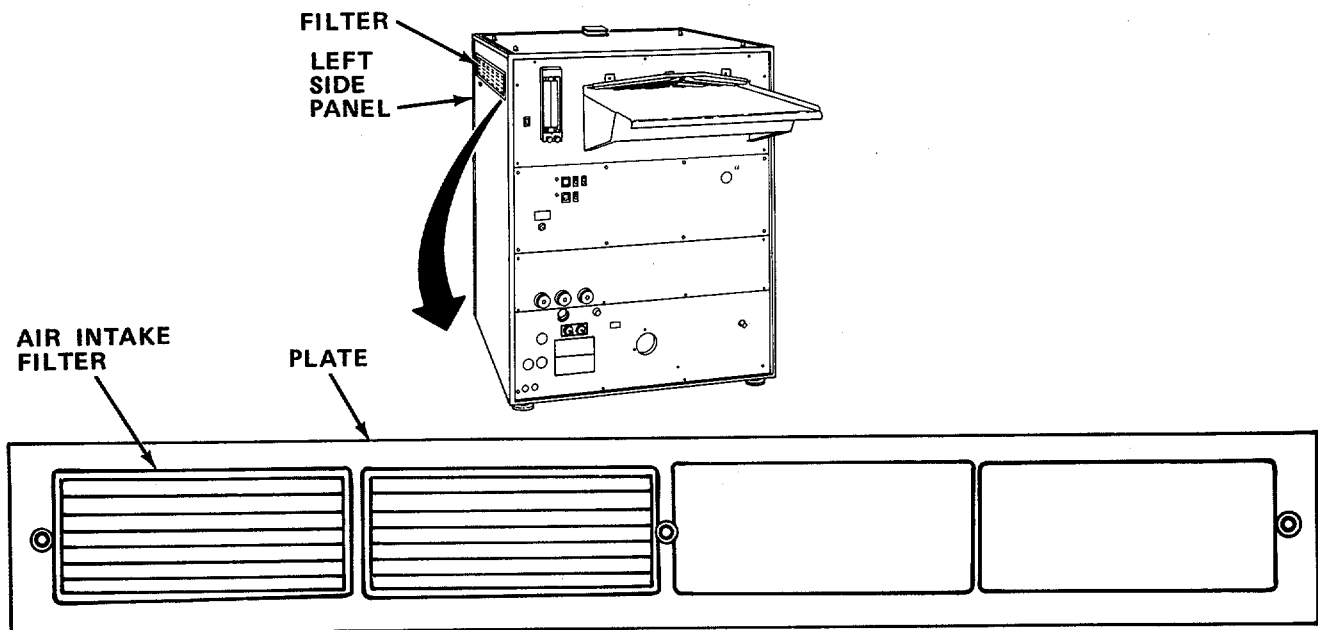


Table 5-2. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2.	DRYER FAN DOES NOT BLOW AIR - Cont	<ul style="list-style-type: none"> (a) If intake filter is clogged, replace intake filter (paragraph 5-10.3). (b) If malfunction persists, refer to organizational maintenance.
3.	RECIRCULATING PUMPS DO NOT OPERATE WHEN FILM IS FED INTO PROCESSOR.	<p>Step 1. Check that MAIN DRIVE switch is ON.</p> <ul style="list-style-type: none"> (a) If MAIN DRIVE switch is ON, proceed to step 2. (b) If MAIN DRIVE switch is OFF, turn on switch. <p>Step 2. Check that DRYER and DEV.HEAT switch is ON.</p> <ul style="list-style-type: none"> (a) If DRYER and DEV.HEAT switch is OFF, turn on switch. (b) If malfunction persists, refer to organizational maintenance.
4.	RECIRCULATED WASH WATER DOES NOT ENTER PROCESSOR.	<p>Step 1. Check that RECIRC PUMP switch is ON.</p> <ul style="list-style-type: none"> (a) If RECIRC PUMP switch ON, proceed to step 2. (b) If RECIRC PUMP switch is not ON, turn on switch. <p>Step 2. Check that position of WATER SUPPLY valve is in pump position.</p> <ul style="list-style-type: none"> (a) If in pump position, proceed to step 3. (b) If not in pump position, rotate WATER SUPPLY valve to pump position. <p>Step 3. Check for clogged recirculation hoses.</p> <ul style="list-style-type: none"> (a) If hoses are clogged, clean hoses. (b) If hoses are not clogged, replace recirculation filter (paragraph 5-10.6).

Table 5-2. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
5.	CHILLER DOES NOT OPERATE WHEN MAIN POWER SWITCH IS ON.	<p>Check for unplugged power supply cord.</p> <p>(a) If unplugged, plug power supply cord in.</p> <p>(b) If malfunction persists, refer to organizational maintenance.</p>
6.	WITH HEATER SWITCH ON, HEATING ELEMENT WILL NOT MAINTAIN PRESET TEMPERATURE IN TANK.	<p>Check for HEATER switch in OFF position.</p> <p>(a) If switch is OFF, turn on HEATER switch.</p> <p>(b) If malfunction persists, refer to organizational maintenance.</p>

5-10. OPERATORS MAINTENANCE PROCEDURES.

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

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

INDEX

PROCEDURE	PARAGRAPH
Replace Developer Filter.....	5-10.1
Service Strainers	5-10.2
Service Air Filter	5-10.3
Service Processing Tanks	5-10.4
Adjust Feed Tray	5-10.5
Replace Recirculation Filter	5-10.6

5-10.1 Replace Developer Filter.

MOS: 83E, Photo and Layout Specialist

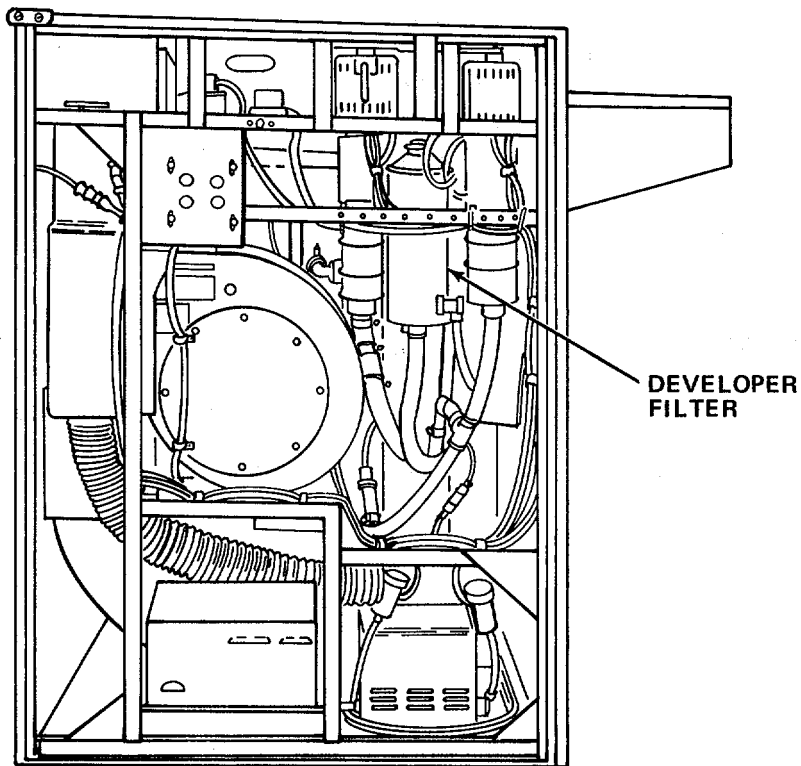
TOOLS: Cross Tip Screwdriver

SUPPLIES: Filter Cartridge
Gasket
Seal

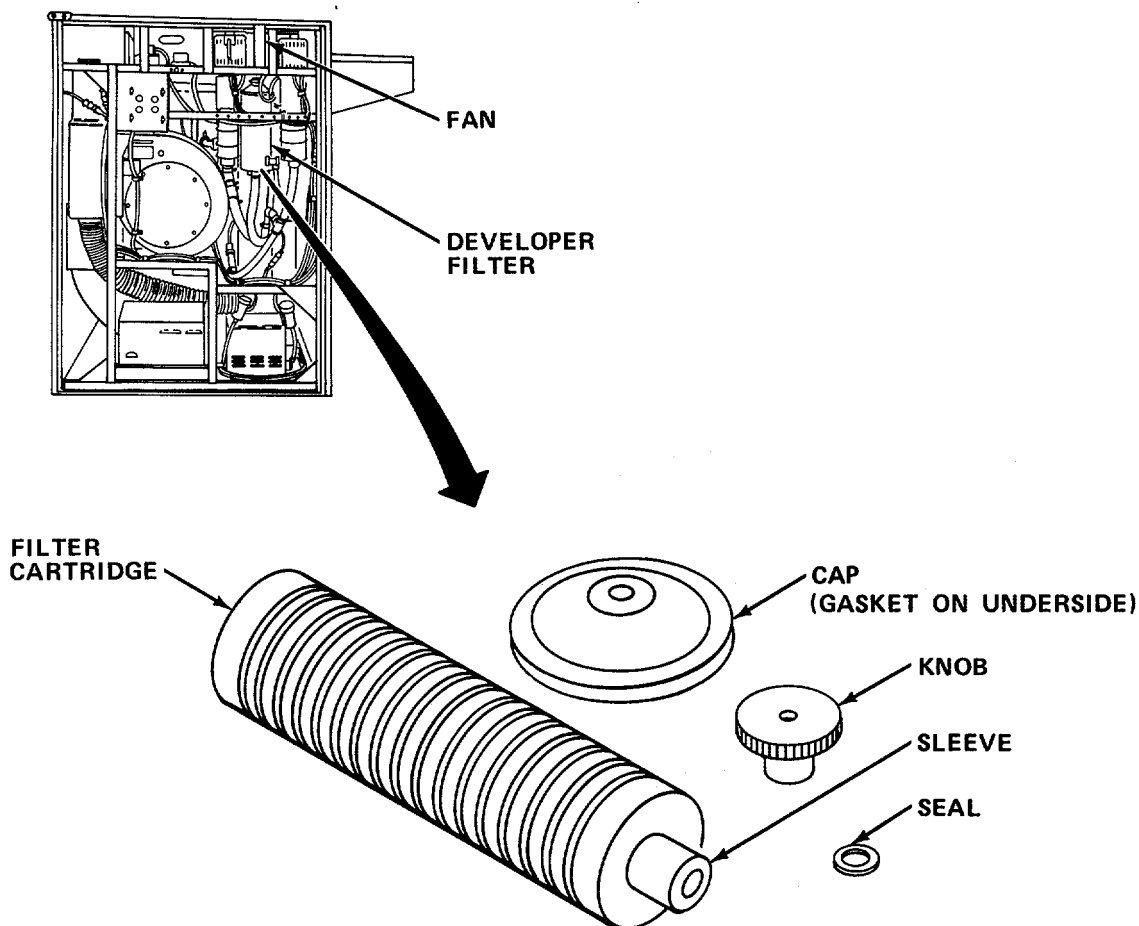
WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn processor circuit breaker OFF.



- b. Remove left access panel.
- c. Remove fixer and developer pump access cover.
- d. Move fan and bracket out of way.



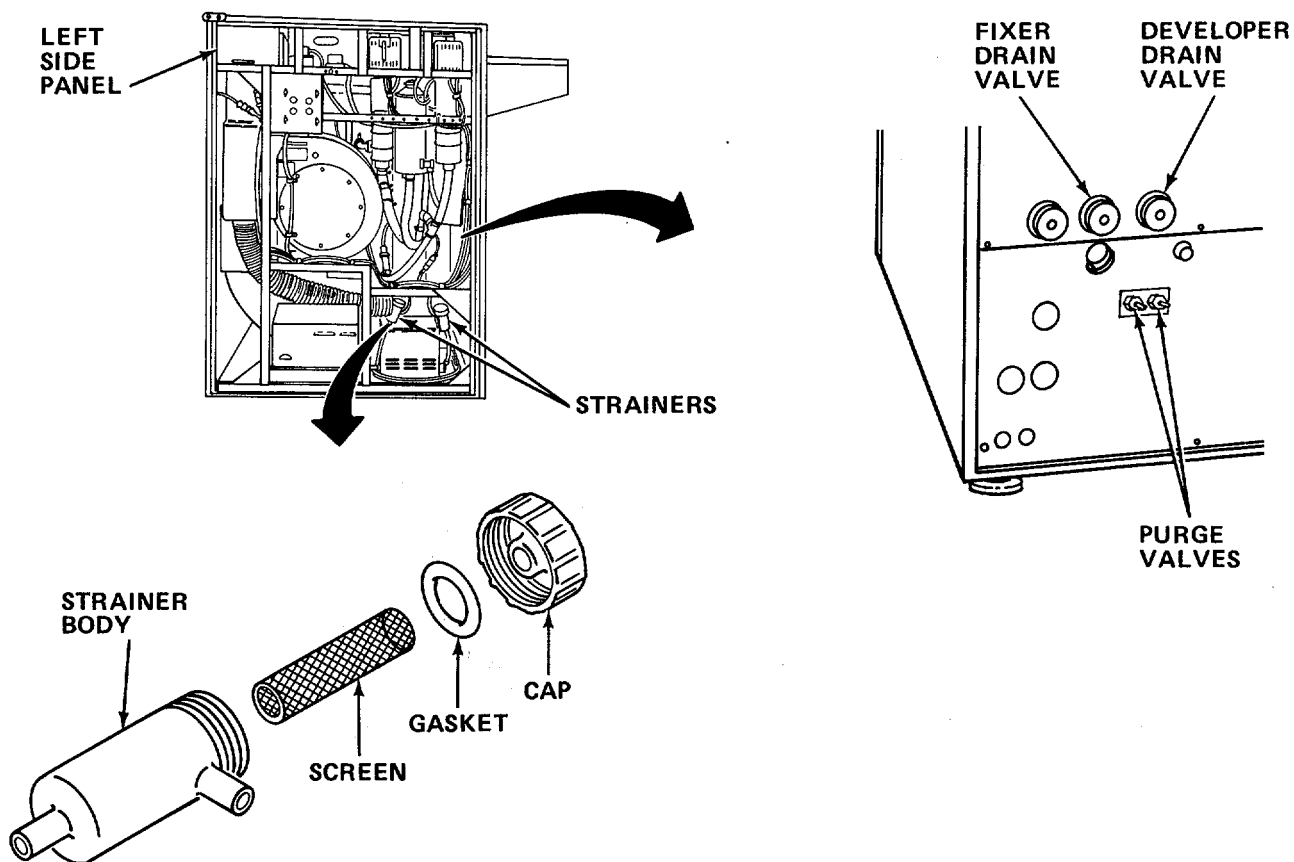
- e. Remove filter knob, seal, cap and gasket.
- f. Remove filter cartridge and sleeve from developer filter.
- g. Reinstall sleeve into new filter cartridge.
- h. Install new filter cartridge into housing.
- i. Check gasket for damage. If damaged, replace. If not damaged, turn gasket over.
- j. Reinstall gasket and cap.
- k. Reinstall seal and knob. Tighten knob securely.
- l. Reinstall fan and bracket.
- m. Reinstall pump access cover.
- n. Reinstall left access panel.
- o. Turn processor circuit breaker on.

5-10.2 Service Strainers.

MOS: 83E, Photo and Layout Specialist

TOOLS: Cross Tip Screwdriver

SUPPLIES: Strainer Gasket



WARNING

Death or serious injury may occur from electrical shock unless circuit breaker is turned OFF before servicing.

- a. Turn off film processor circuit breaker.
- b. Remove left access panel.
- c. Disconnect the quick-release fittings from developer and fixer replenishment tanks.
- d. Unscrew strainer cap. Remove gasket and screen. Discard gasket.
- e. Wash screen in warm water.
- f. Reinstall clean screen, new gasket, and cap on strainer body.

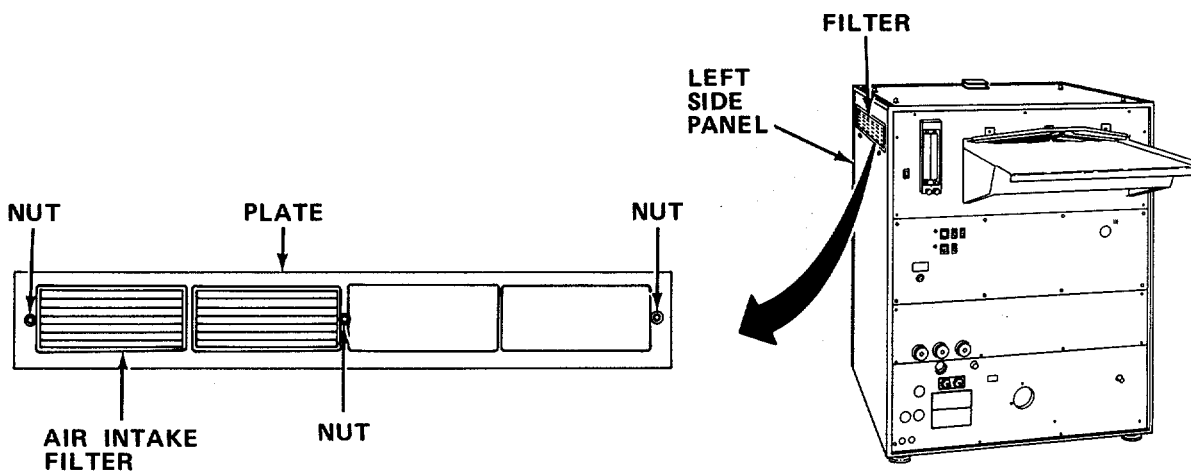
- g. Replace left access panel.
- h. Close drain valves.
- i. Reconnect quick-release fittings on developer and fixer replenishment tanks.
- j. Using purge valves, purge air from system.
- k. Turn processor circuit breaker on.

5-10.3 Service Air Filter.

MOS: 83E, Photo and Layout Specialist

TOOLS: None required

SUPPLIES: Air Filter



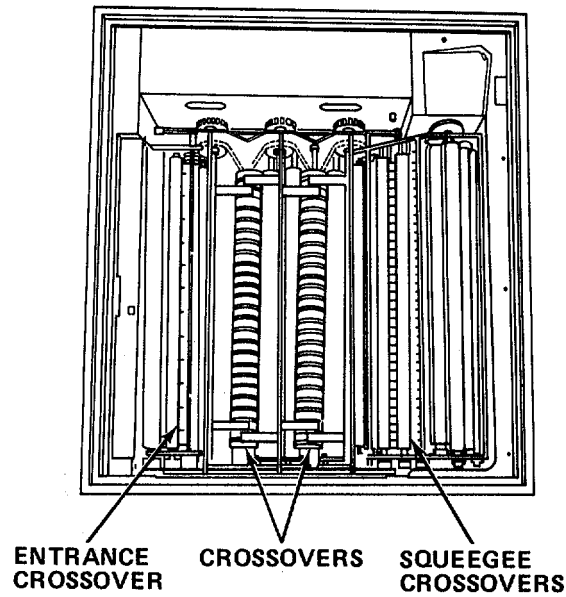
- a. Remove left access panel.
- b. Remove three nuts retaining plate to panel. Remove plate.
- c. Remove filter from panel.
- d. Wash filter in warm water and air-dry.
- e. Inspect filter for tears, holes, etc. Replace if necessary.
- f. Reinstall air filter into panel.
- g. Reinstall plate and retain with nuts.
- h. Reinstall left access panel to processor.

5-10.4 Service Processing Tanks.

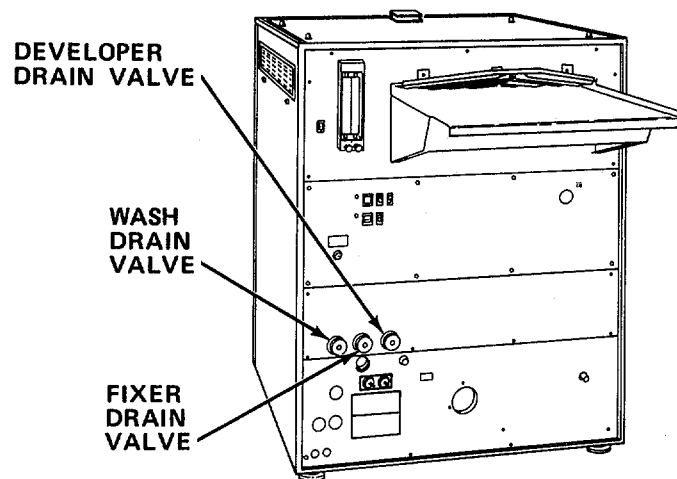
MOS: 83E, Photo and Layout Specialist

TOOLS: Cross Top Screwdriver

SUPPLIES: Developer System Cleaner
 Fixer System Cleaner
 Developer Solution
 Fixer Solution
 Developer Filter



- a. Remove top cover, crossover assemblies, and rack assemblies.



CAUTION

To prevent flooding and/or damage to sump pump, open only one drain valve at a time.

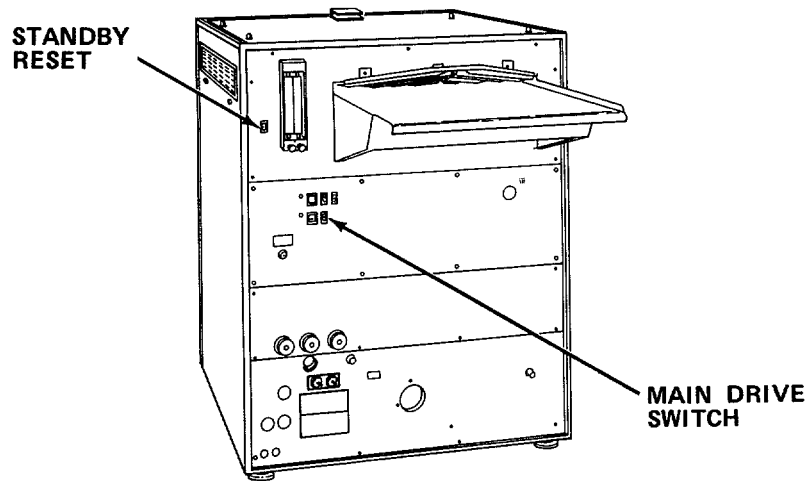
- b. Drain system by opening DEV, FIX, and WASH drain valves at rear of unit.
- c. Close all drain valves and fill wash tank with water.
- d. Clean and drain wash tank. Close WASH drain valve.

WARNING

Always wear eye/face protective equipment when using system cleaners to prevent injury to eyes.

CAUTION

- Use developer cleaner only in developer tank and fixer cleaner only in fixer tank.
 - Follow manufacturer's instructions for mixing cleaning solutions to ensure proper ratios.
 - Use splash guards when servicing processor, or serious contamination of processor will result.
- e. Remove developer filter element (paragraph 5-10.1) and replace filter cap.
 - f. Fill developer tank with developer system cleaner.
 - g. Fill fixer tank with fixer system cleaner.



CAUTION

Do not immerse racks in cleaning solutions for a longer period of time than that specified by manufacturer's instructions, or damage may result.

- h. Install rack assemblies in processor.
- i. Turn ON MAIN DRIVE switch on front panel. Switch STANDBY RESET switch to OPERATING MODE and run unit for amount of time recommended by manufacturer of cleaning solution.

CAUTION

To prevent flooding and/or damage to sump pump, open only one drain valve at a time.

- j. Drain system by opening DEV and FIX drain valves. Close valves after draining.
- k. Remove and clean wash, fixer, and developer rack assemblies.
- l. Fill wash, developer, and fixer tanks with clean water.
- m. Turn ON MAIN DRIVE switch. Turn STANDBY RESET switch to OPERATING MODE and run unit for 15 minutes. Turn OFF MAIN DRIVE switch.

CAUTION

To prevent flooding and/or damage to sump pump, open only one drain at a time.

- n. Open DEV, FIX, and WASH drain valves, and drain system. Close valves.
- o. Reinstall wash, fixer, and developer rack assemblies.
- p. Refill tanks with clean water.
- q. Turn ON MAIN DRIVE switch and turn STANDBY RESET switch to OPERATING MODE. Allow unit to run for 10 minutes. Turn OFF MAIN DRIVE switch.

CAUTION

To prevent flooding and/or damage to sump pump, open only one drain valve at a time.

- r. Open DEV, FIX, and WASH drain valves, and drain system. Close all valves.
- s. Install new developer filter element (paragraph 5-10.1).

CAUTION

Use splash guard when filling developer and fixer tanks to prevent contamination of solutions.

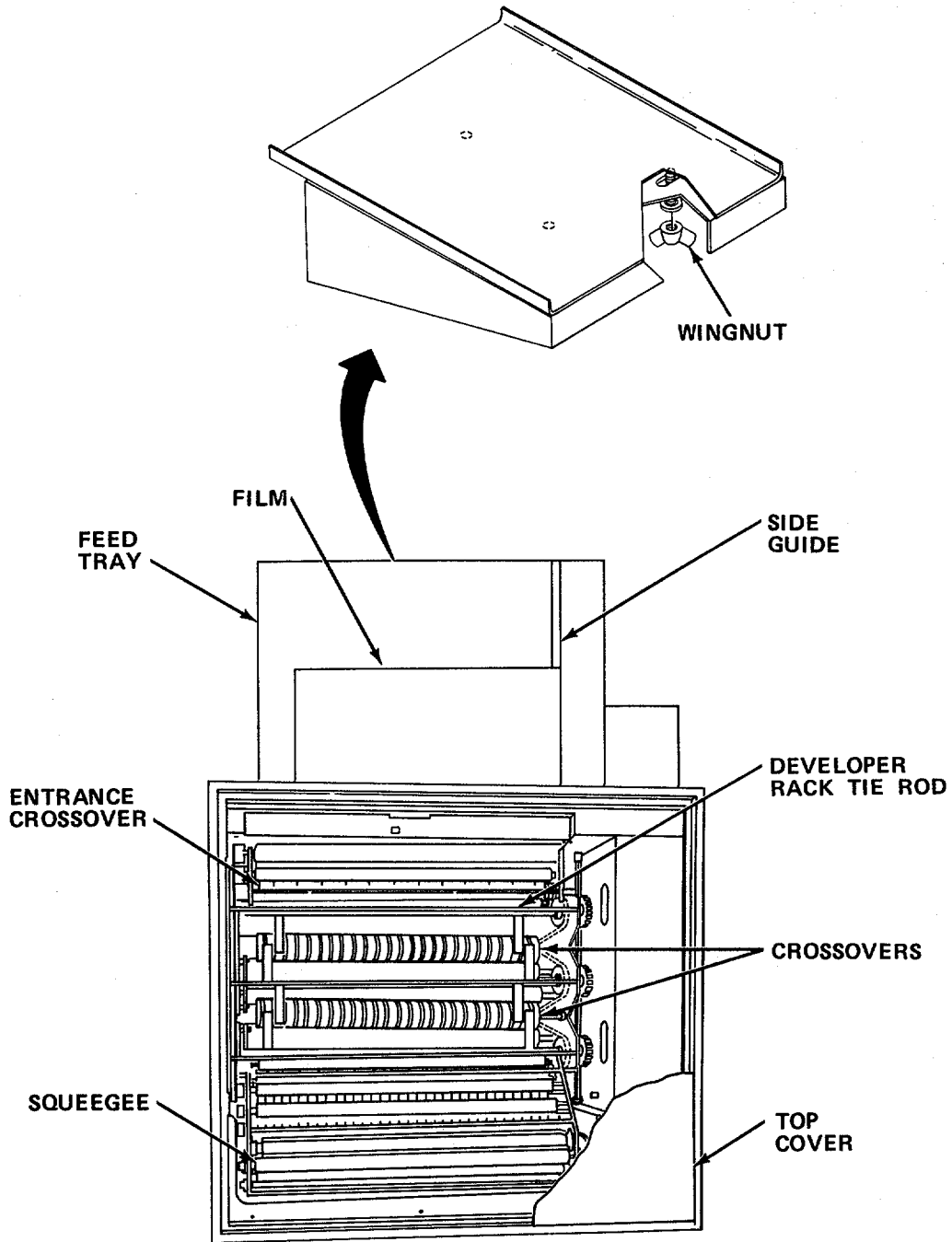
- t. Refill tanks with fresh developer and fixer solutions.

5-10.5 Adjust Feed Tray.

MOS: 83E, Photo and Layout Specialist

TOOLS: Cross Tip Screwdriver

SUPPLIES: Photographic Film



- a. Remove top cover.
- b. Remove crossovers and entrance crossover.
- c. Verify that feed tray is square with tie rod of developer rack assembly.
Place a sheet of film against the side guide of the feed tray, and manually feed approximately 1 in. (25.4 mm) of film into the unit.
- d. Pull the leading edge of the film up to and square with the tie rod of the developer rack.
- e. If film is not square with the side guide, loosen the wingnuts under the feed tray. Square tray with edge of film.
- f. Tighten wingnuts.
- g. Reinstall entrance crossover and crossovers.
- h. Replace top cover.

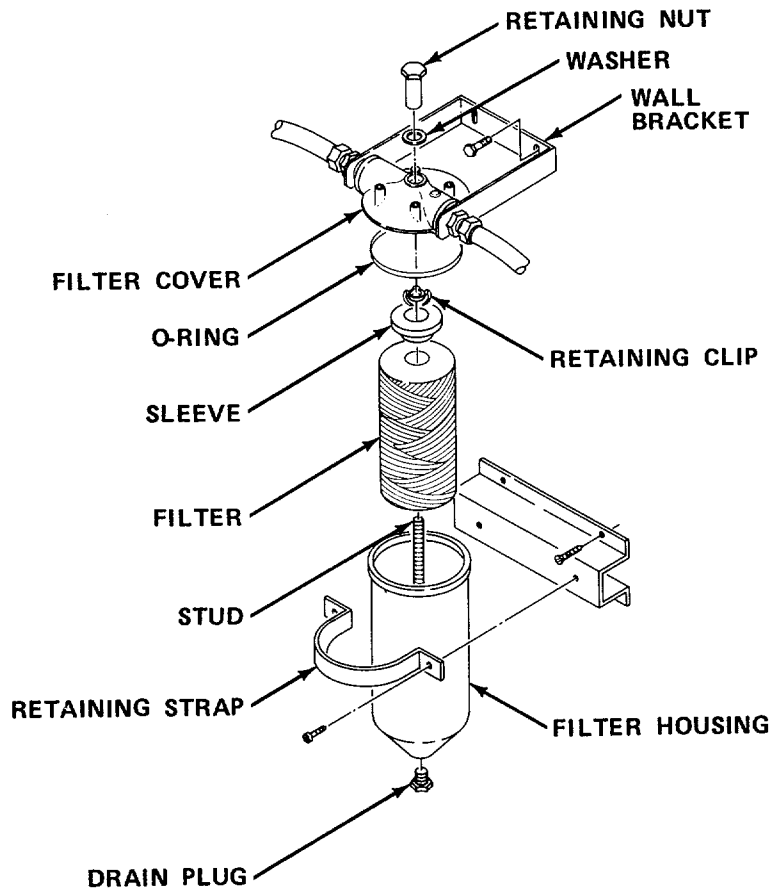
5-10.6 Replace Recirculation Filter.

MOS: 83E, Photo and Layout Specialist

TOOLS: Cross Tip Screwdriver 10 in. Adjustable Wrench

SUPPLIES: Plastic Utility Pail (Item 35, Appendix E)
Filter
Seal

- a. Turn off RECIRC PUMP switch.
- b. Position WATER SUPPLY valve to off position.



- c. Drain recirculation filter by placing pail under filter and removing drain plug.
- d. Loosen "U" shaped retaining strap.
- e. Loosen top retaining nut and remove housing, filter, and seal.
- f. Remove retaining clip, sleeve, and filter from housing and discard filter.
- g. Clean housing with water.
- h. Install new filter in housing. Secure with sleeve and retaining clip.
- i. Install new seal (if required), housing, and filter. Tighten retaining nut.
- j. Tighten retaining strap.
- k. Reinstall drain plug.
- l. Position WATER SUPPLY valve to pump position.

Section IV. ORGANIZATIONAL MAINTENANCE

5-11. LUBRICATION INSTRUCTIONS . This equipment does not require lubrication at this level of maintenance.

5-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT.

5-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

5-12.2 Special Tools; Test, Measurement, and Diagnostic Equipment; and Support Equipment. No special tools; test, measurement, and diagnostic equipment; or support equipment are required for the repair of this equipment at the organizational level of maintenance.

5-12.3 Repair parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-3610-285-24P covering organizational maintenance for this equipment.

5-13. SERVICE UPON RECEIPT.

5-13.1 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.

5-14. 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 column. 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:

<u>Item</u>	<u>Quantity</u>
Bimetallic Thermometer	1 ea
Flat Tip Screwdriver	1 ea
Flat Tip Nonmetallic Screwdriver	1 ea
Cross Tip Screwdriver	1 ea
Slip Joint Pliers	1 ea
Thickness Gage Set	1 ea

Table 5-3. ORGANIZATIONAL PEVENTIVE 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

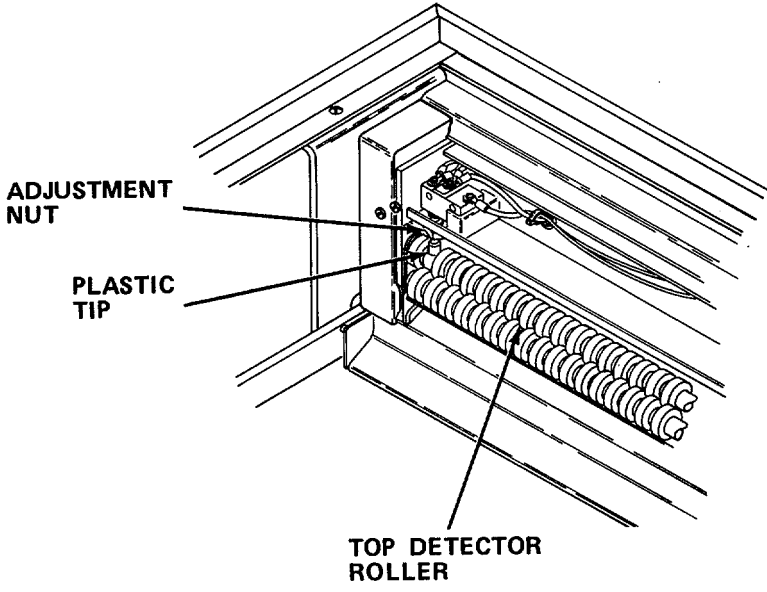
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED	PROCEDURE
1	S	<p><u>FILM PROCESSOR</u></p> <p><u>Adjust Detector Switches.</u></p> <ol style="list-style-type: none"> 1. Remove top cover. 2. Remove entrance crossover. 3. Remove detector roller cover. 4. Push the REPL PUMP switch to AUTO.  <ol style="list-style-type: none"> 5. Using a thickness gage, make sure gap between plastic tip(s) and top detector roller is 0.020 in. to 0.025 in. (0.5 mm to 0.6 mm). This should be done without any film between rollers. 6. If you need to change gap(s), turn adjusting nut(s). Tightening each adjusting nut lowers each switch shaft toward roller. 	

Table 5-3. ORGANIZATIONAL PEVENTIVE 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	
1	S	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Adjust Detector Switches - Cont</u></p> <p>7. Insert a piece of 0.004 in. (0.10 mm) thick film into detector rollers in several places, to make sure switches turn on replenisher pump.</p> <p>8. Reinstall detector roller.</p> <p>9. Reinstall entrance crossover.</p> <p>10. Reinstall top cover.</p>	
2	S	<p><u>Adjust Developer Temperature.</u></p> <p>1. Turn on MAIN DRIVE switch.</p> <p>2. Set recirculating tank thermostat at 75°F.</p> <p style="text-align: center;">NOTE</p> <p>Allow processor to operate for 20 minutes prior to checking developer temperature.</p> <p style="text-align: center;">CAUTION</p> <p>Do not use mercury thermometers in processor. If a mercury thermometer is broken inside the processor, serious mercury contamination will result. Use a bimetallic thermometer.</p> <p>3. Remove top cover and left access cover. Insert a bimetallic thermometer between developer rack and side of tank.</p> <p>4. Check developer solution temperature. Developer temperature should be 68°F to 75°F (20°C to 23.8°C) (or per manufacturer's specifications for developer), or developer thermostat must be adjusted.</p>	

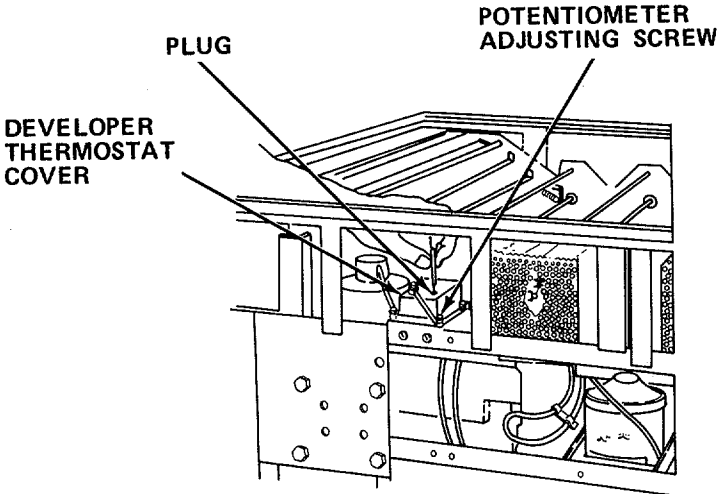
Table 5-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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	
2	S	<p><u>FILM PROCESSOR - Cont</u></p> <p><u>Adjust Developer Temperature - Cont</u></p>  <p style="text-align: center;">NOTE</p> <p>Allow sufficient time for solution temperature to stabilize after adjustment, before taking readings.</p> <ol style="list-style-type: none"> 5. Remove fixer and developer pump access cover. 6. Remove plastic plug from developer thermostat cover. A small adjustment will change temperature several degrees, so move screw only about 1/8 turn at a time. 7. Using a small, nonmetallic screwdriver, turn potentiometer adjusting screw right to raise developer temperature and left to lower developer temperature. 8. Remove thermometer from developer tank. 9. Reinstall plug and covers. 	

5-15. 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 is not corrected by a listed corrective action, notify your supervisor.
- c. For unidentified malfunctions, use the facing schematic or foldouts located at the end of this manual for further fault analysis.

NOTE

Sufficient data is not always 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.

Table 5-4. POWER DISTRIBUTION

PART	ENERGIZED BY
TRANSPORT SPEED CONTROL, A1	TOP COVER INTERLOCK SWITCH S7 MAIN DRIVE SWITCH S5 POWER SUPPLY PCB 600 STANDBY CONTROL PCB 500 (PROCESSOR IN RUN MODE.) FUSE FU4 FUSE FU5
DRYER HEATER, A1-HTR DRYER HEATER, A2-HTR	DRYER O.T. THERMOSTAT - THS1 SOLID-STATE RELAY U1 DRYER TEMPER. CONTROL PCB 800 DRYER FAN SWITCH S3 POWER SUPPLY PCB 600 FUSE FU5 MAIN DRIVE SWITCH S5 STANDBY CONTROL PCB 500 (IN RUN MODE.) FUSE FU4
DRYER BLOWER MOTOR, B1	SOLID-STATE RELAY U2 DRYER TEMP CONTROL PCB 800 DRYER FAN SWITCH S3 POWER SUPPLY PCB 600 FUSE FU5 MAIN DRIVE SWITCH S5 STANDBY CONTROL PCB 500 (IN RUN MODE.) FUSE FU4
DEVELOPER RECIRCULATION PUMP, B2	FUSE FU1 FUSE FU2 RELAY K603-1 DRYER FAN SWITCH S3 POWER SUPPLY PCB 600 MAIN DRIVE SWITCH S5 FUSE FU5 FUSE FU4
FIXER RECIRCULATION PUMP, B3	MOTOR START RELAY U4 RELAY K603-1 DRYER FAN SWITCH S3 POWER SUPPLY PCB 600 MAIN DRIVE SWITCH S5 FUSE FU1 FUSE FU2 FUSE FU5 FUSE FU4

Table 5-4. POWER DISTRIBUTION - Cont

PART	ENERGIZED BY
REPLENISHER PUMP, B4	"AUTO/MANUAL" SWITCH S1 FUSE FU1 FUSE FU2 SOLID-STATE RELAY U5 DRYER FAN SWITCH S3 DETECTOR ROLLER ASSEMBLY MS1/MS2 POWER SUPPLY PCB 600 MAIN DRIVE SWITCH S5 FILM PRESENT STANDBY CONTROL PCB 500 (IN RUN MODE.) FUSE FU5 FUSE FU4
COOLING FAN, B5	FUSE FU4 MAIN DRIVE SWITCH S5
MAIN DRIVE MOTOR, B6	MOTOR SPEED CONTROL A1 TOP COVER INTERLOCK SWITCH S7 MAIN DRIVE SWITCH S5 POWER SUPPLY PCB 600 STANDBY CONTROL PCB 500 (IN RUN MODE.) FUSE FU5 FUSE FU4
FEED SIGNAL BUZZER, DS1	DETECTOR ROLLER ASSEMBLY MS1/MS2
MANUAL REPLENISH LAMP, DS2	SWITCH S1 IN "MANUAL" POSITION FUSE FU1 FUSE FU2
DEVELOPER HEATER INDICATOR LAMP, DS3	LAMP SWITCH SW4 SOLID-STATE RELAY U3 DEVELOPER TEMPERATURE CONTROL PCB 700 DRYER FAN SWITCH S3 POWER SUPPLY PCB 600 MAIN DRIVE SWITCH S5 FUSE FU1 FUSE FU2 FUSE FU5 FUSE FU4
DRYER HEATER INDICATOR LAMP, DS4	SOLID-STATE RELAY U1 DRYER TEMP CONTROL PCB 800 DRYER FAN SWITCH S3 POWER SUPPLY PCB 600 FUSE FU5 MAIN DRIVE SWITCH S5 FUSE FU4 STANDBY CONTROL PCB 500 (IN RUN MODE.)

Table 5-4. POWER DISTRIBUTION - Cont

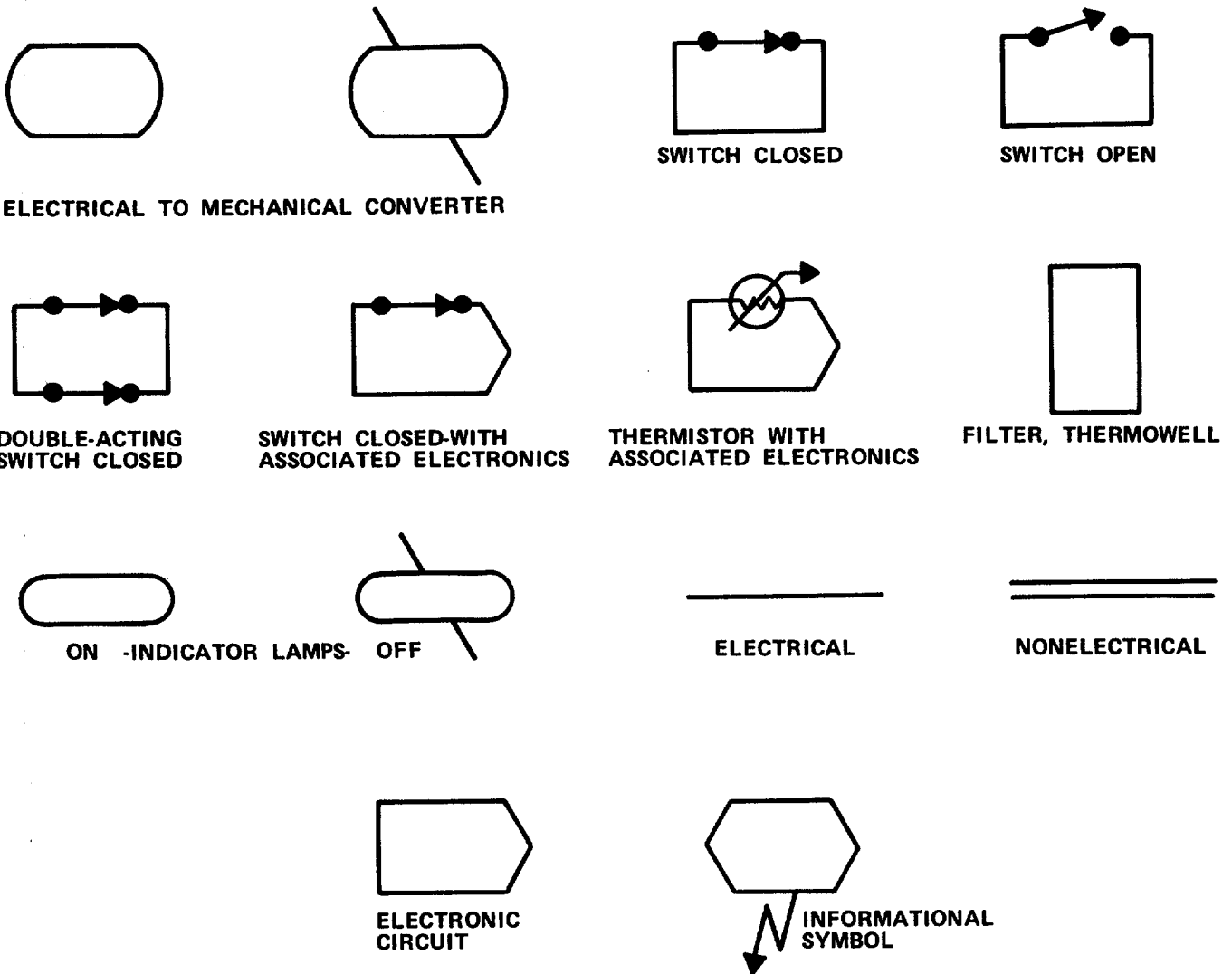
PART	ENERGIZED BY
DEVELOPER HEATER, D-HTR	SOLID-STATE RELAY U3 DEVELOPER TEMP CONTROL PCB 700 DRYER FAN SWITCH S3 POWER SUPPLY PCB 600 MAIN DRIVE SWITCH S5 FUSE FU5 FUSE FU4
ACCESSORY RECEPTACLE, E3	FUSE FU3 RELAY K601-1 POWER SUPPLY PCB 600 MAIN DRIVE SWITCH S5 FUSE FU5 FUSE FU4
WATER SOLENOID L1 2.65 liters/min (0.7 gal/min)	RELAY K602 WATER CONTROL THERMOSTAT THS2 BRIDGE RECTIFIER CIRCUIT CR1 MAIN DRIVE SWITCH S5 FUSE FU4
WATER SOLENOID L2 2.65 liters/min (0.7 gal/min)	RELAY K1001 WATER CONTROL THERMOSTAT THS2 BRIDGE RECTIFIER CIRCUIT CR1 MAIN DRIVE SWITCH S5 FUSE FU4
WATER SOLENOID L3 1.14 liters/min (0.3 gal/min)	RELAY K1001 BRIDGE RECTIFIER CR1 MAIN DRIVE SWITCH S5 FUSE FU4
FLOWMETER LAMP, LT	FUSE FU4 LAMP SWITCH SW4
DETECTOR ROLLER ASSEMBLY, MS1/MS2	PRESENCE OF FILM
ELAPSED-TIME INDICATOR, MI	TOP COVER INTERLOCK SWITCH S7 MAIN DRIVE SWITCH S5 FUSE FU4
SOLID-STATE RELAY, U1 and/or U2	DRYER TEMP.CONTROL PCB 800 DRYER FAN SWITCH S3 POWER SUPPLY PCB 600 MAIN DRIVE SWITCH S5 FUSE FU4 FUSE FU5

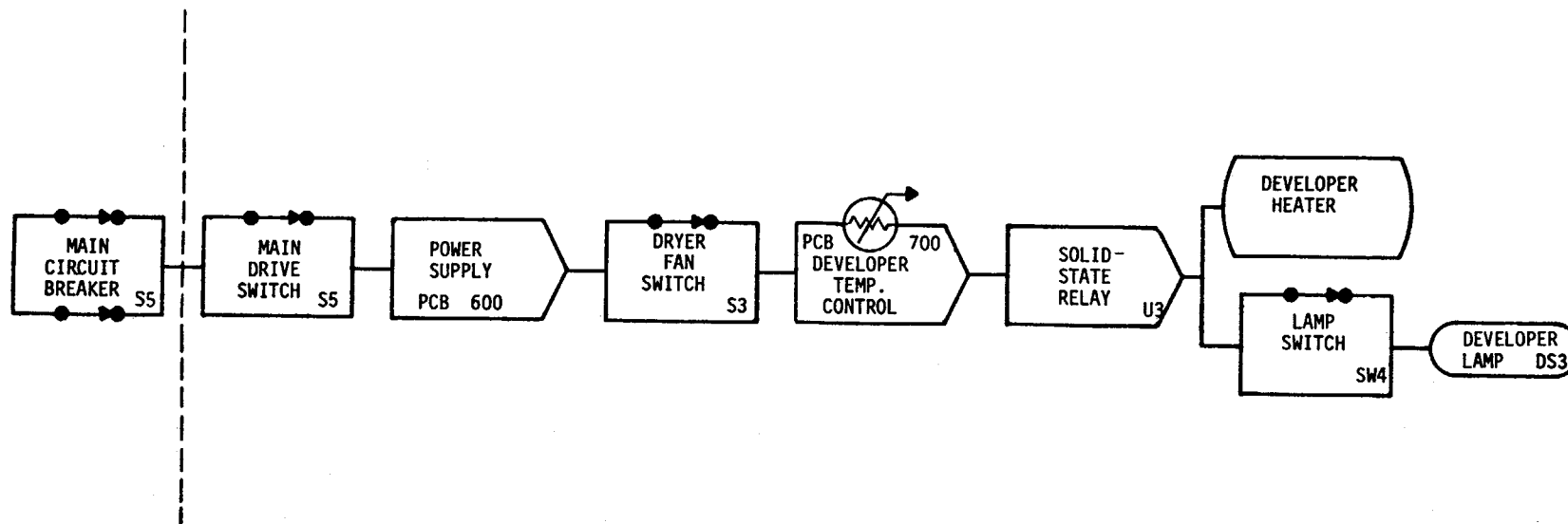
Table 5-4. POWER DISTRIBUTION - Cont

PART	ENERGIZED BY
SOLID-STATE RELAY, U3	DEVELOPER TEMP.CONTROL PCB 700 DRYER FAN SWITCH S3 POWER SUPPLY PCB 600 MAIN DRIVE SWITCH S5 FUSE FU4 FUSE FU5
MOTOR START RELAY, U4	RELAY K603-1 DRYER FAN SWITCH S3 POWER SUPPLY PCB 600 FUSE FU5 MAIN DRIVE SWITCH S5 FUSE FU4
SOLID-STATE RELAY, U5	DRYER FAN SWITCH S3 DETECTOR ROLLER ASSEMBLY MS1/MS2 POWER SUPPLY PCB 600 FUSE FU5 MAIN DRIVE SWITCH S5 FUSE FU4

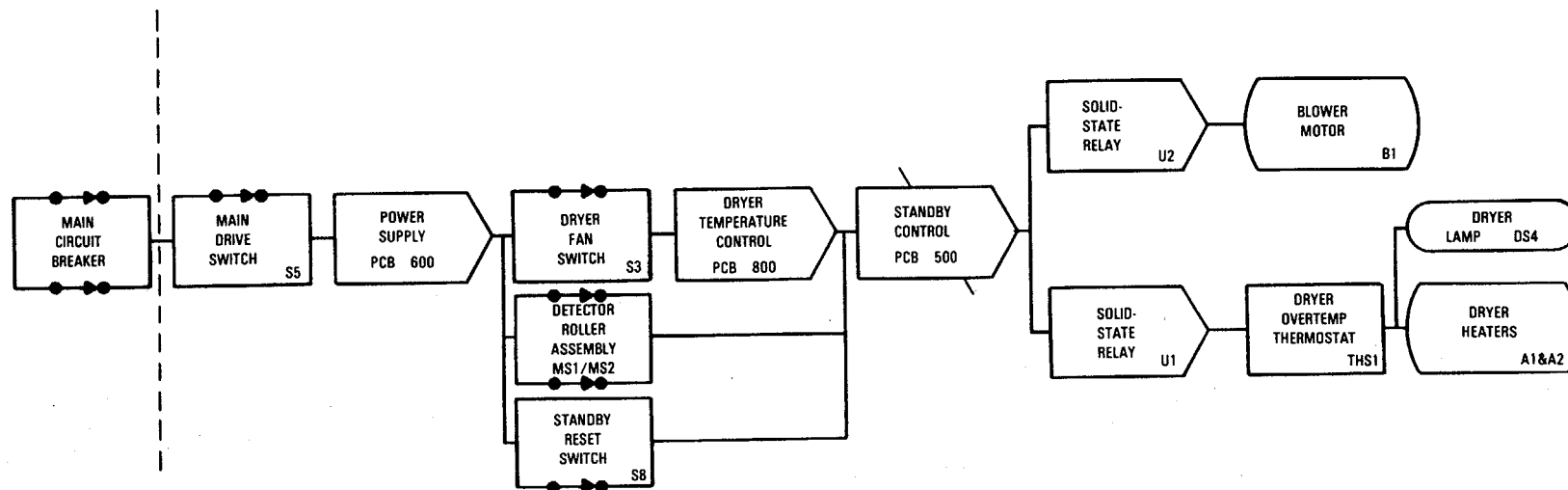
NOTE

The symbols below are used in the Sequence of Operation diagrams, and on foldout FO 5-1

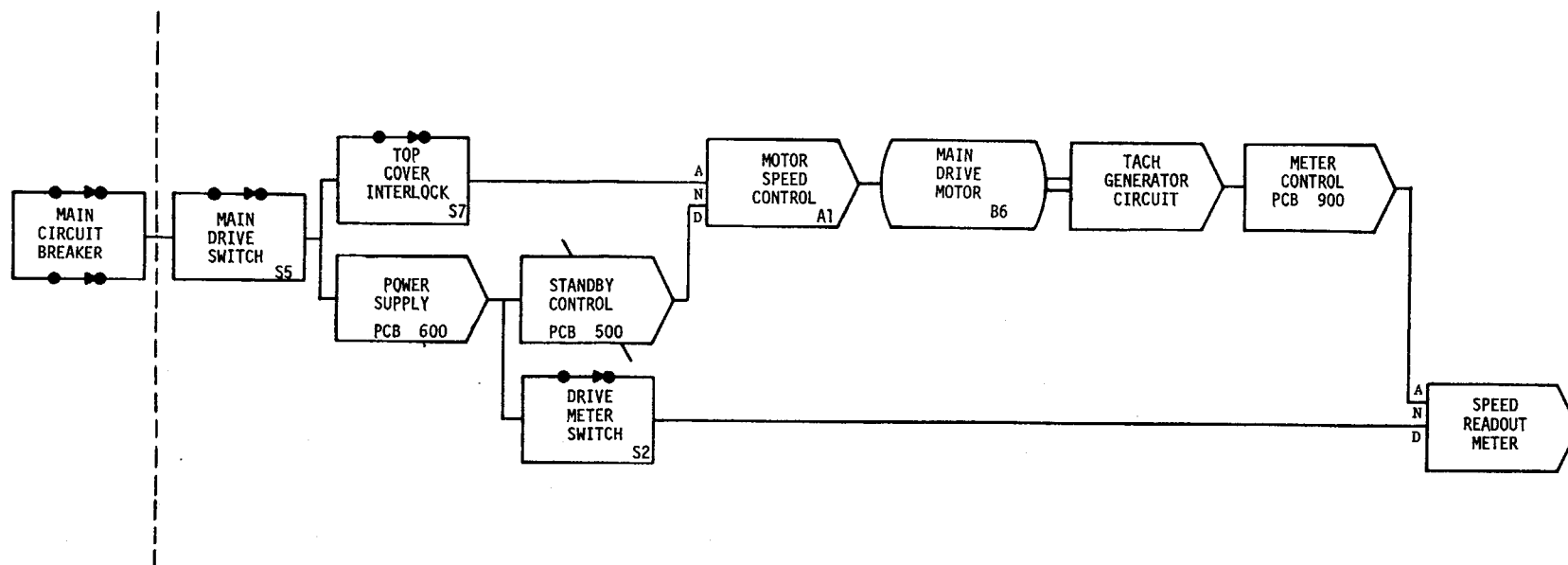




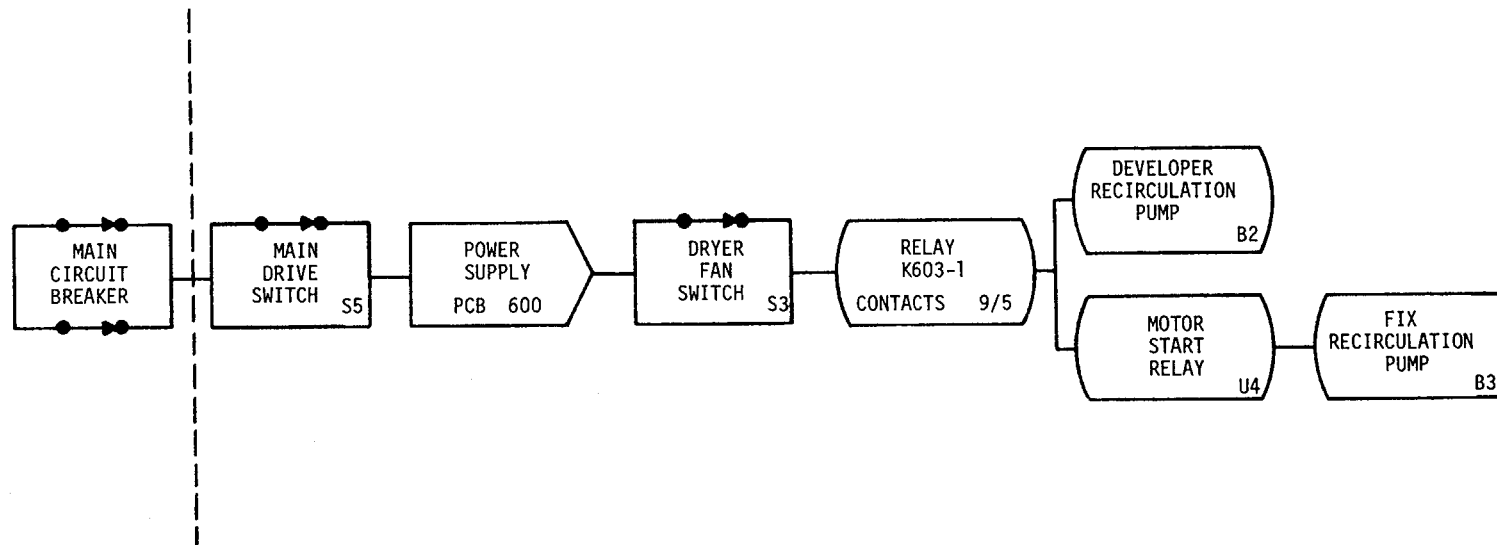
SEQUENCE OF OPERATION - DEVELOPER TEMPERATURE CONTROL



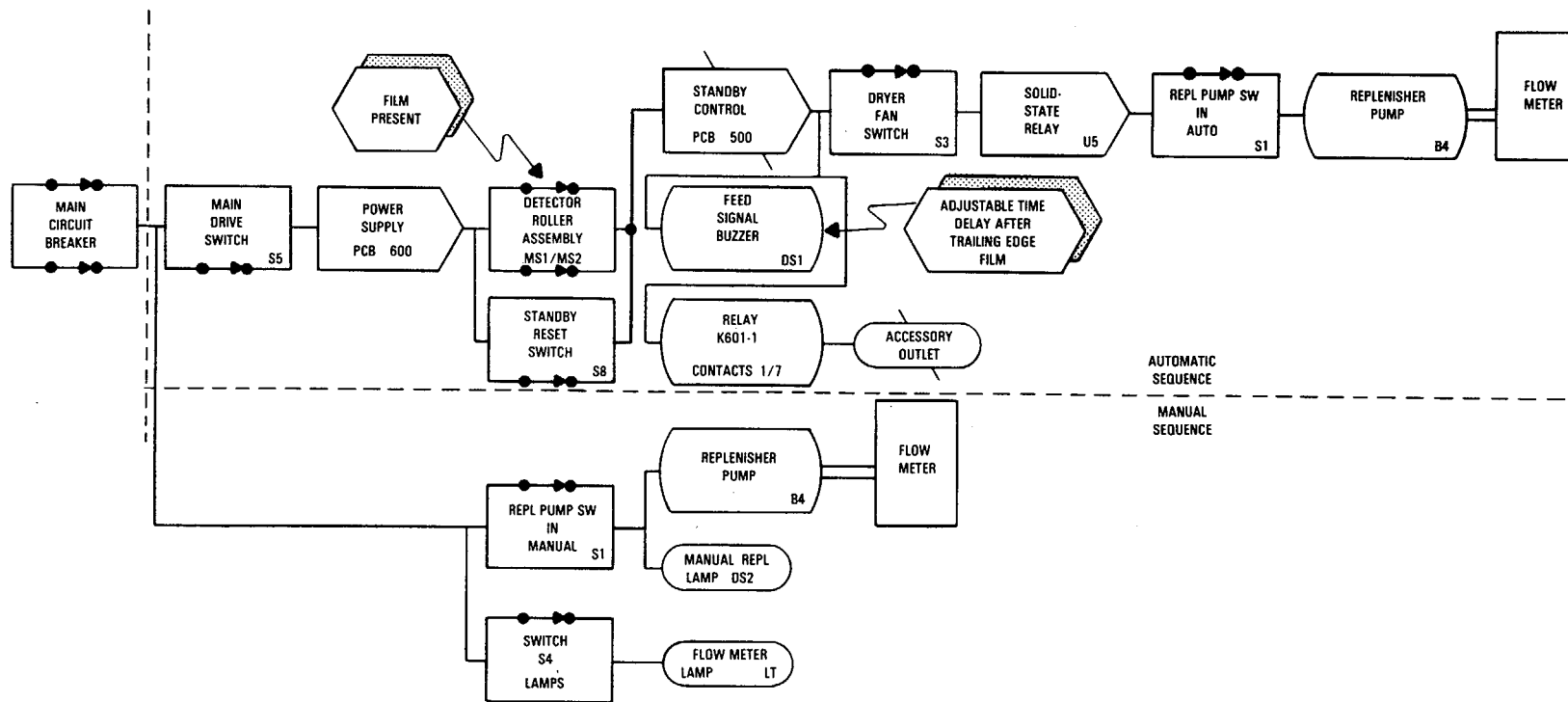
SEQUENCE OF OPERATION - DRYER TEMPERATURE CONTROL



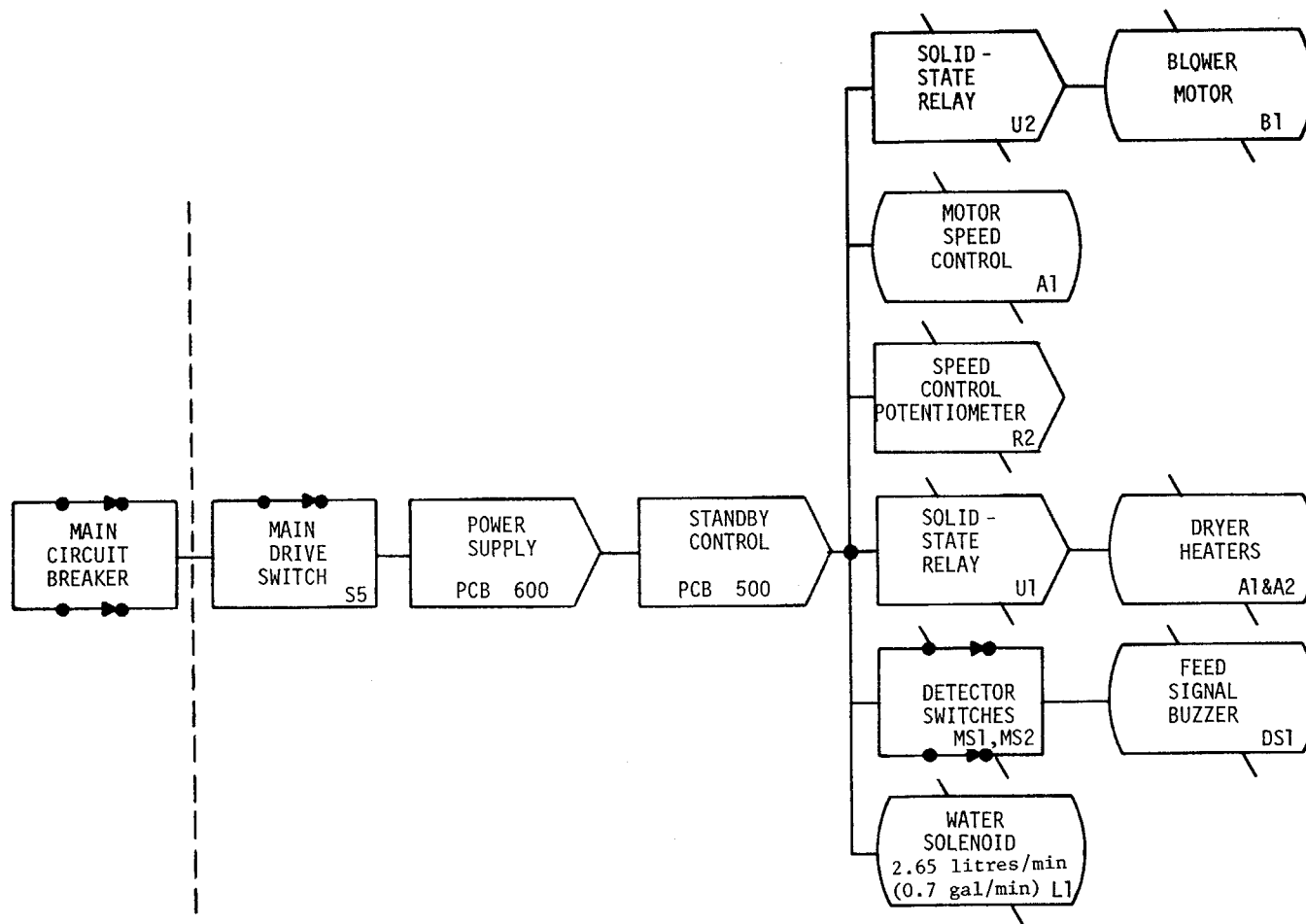
SEQUENCE OF OPERATION - MAIN DRIVE



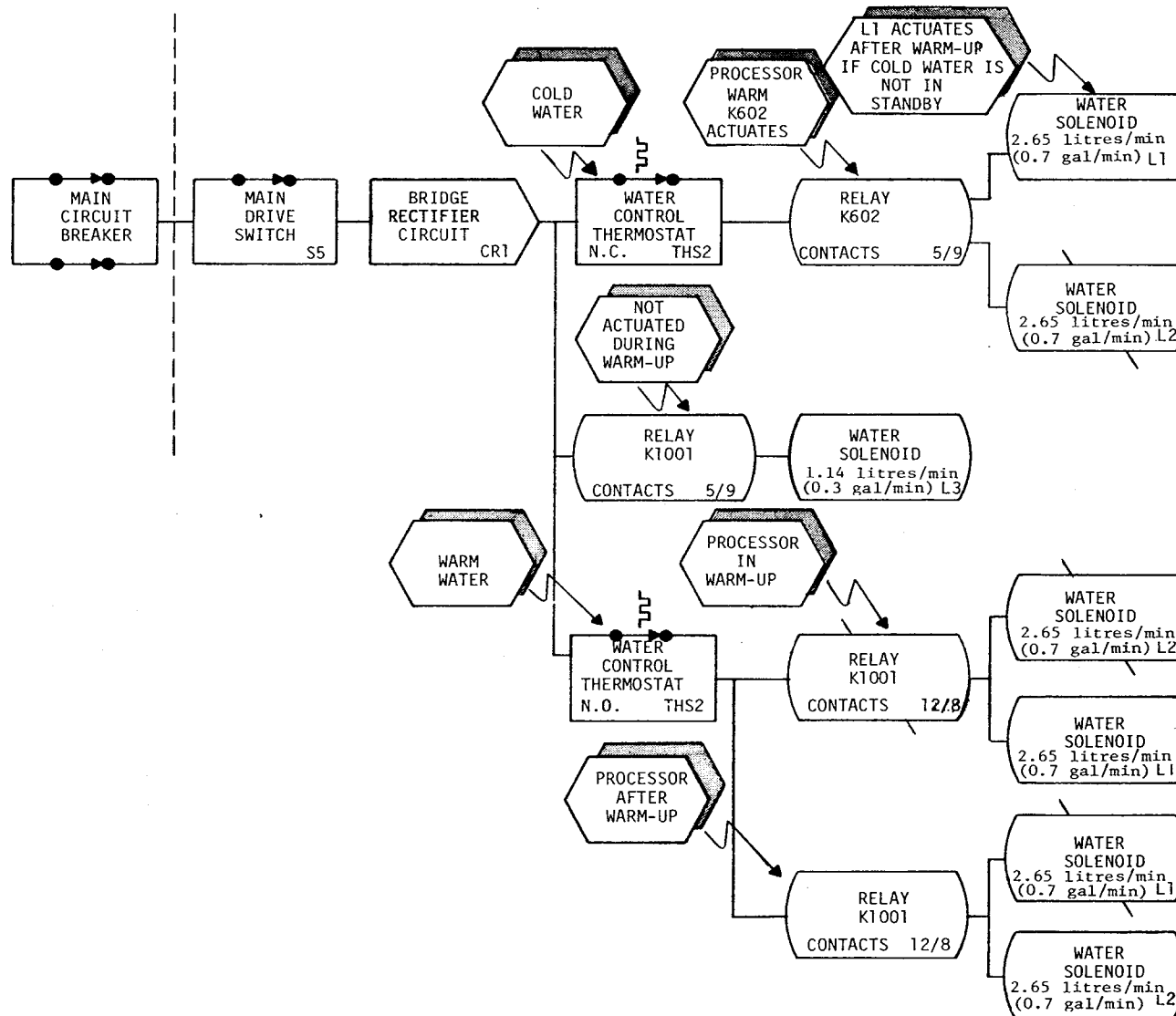
SEQUENCE OF OPERATION - RECIRCULATION



SEQUENCE OF OPERATION - REPLENISHMENT



SEQUENCE OF OPERATION - STANDBY CONTROL

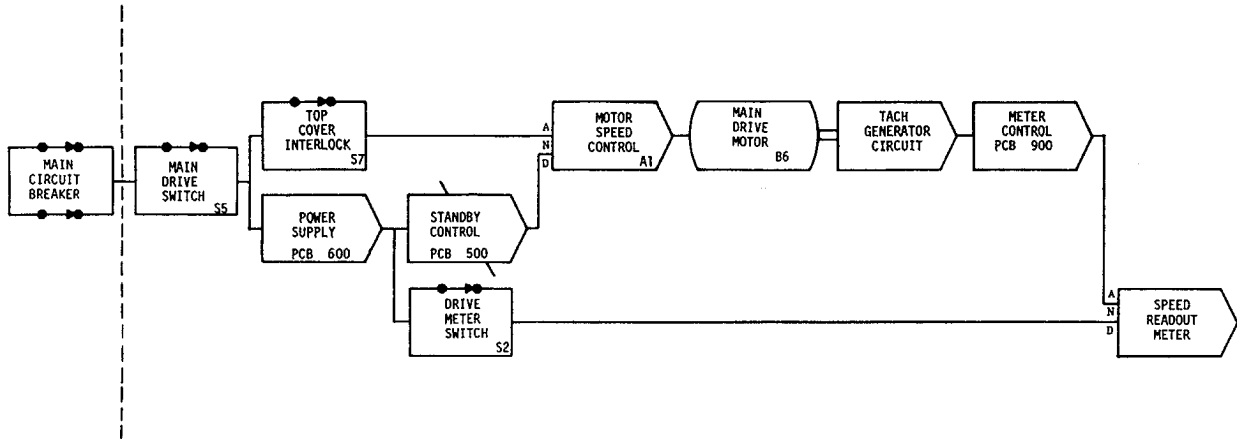


WATER CONTROL
5-97

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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1. ROLLERS DO NOT ROTATE WHEN CIRCUIT BREAKER AND MAIN DRIVE SWITCHES ARE ON.



SEQUENCE OF OPERATION - MAIN DRIVE

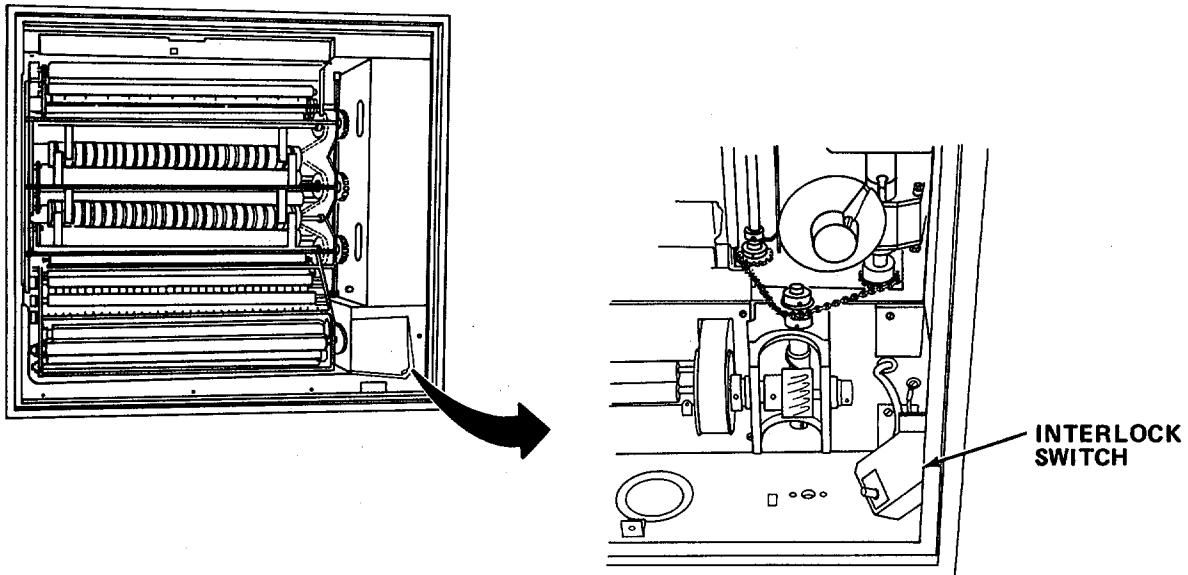
Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

1. ROLLERS DO NOT ROTATE WHEN CIRCUIT BREAKER AND MAIN DRIVE SWITCHES ARE ON - Cont

WARNING

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

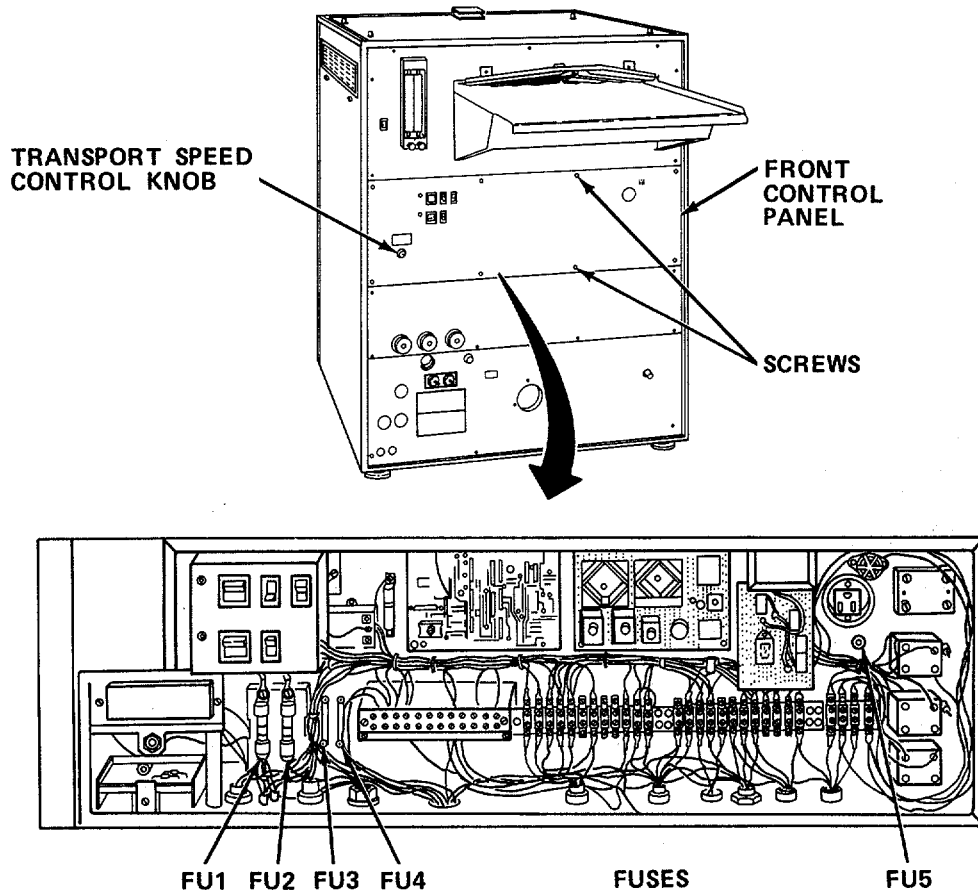


- Step 1. Check top cover interlock switch for continuity. Remove rear plastic guards to gain access to top cover interlock switch.
- If switch is not defective, proceed to step 2.
 - If switch is defective, replace top cover interlock switch (paragraph 5-16.10).

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

1. ROLLERS DO NOT ROTATE WHEN CIRCUIT BREAKER AND MAIN DRIVE SWITCHES ARE ON - Cont



Step 2. Check for defective fuse FU4.

- (a) If fuse is good, proceed to step 3.
- (b) If fuse is open, replace fuse (paragraph 5-16.1).

Step 3. Check for defective fuse FU5.

- (a) If fuse is good, proceed to step 4.
- (b) If fuse is defective, replace fuse (paragraph 5-16.1).

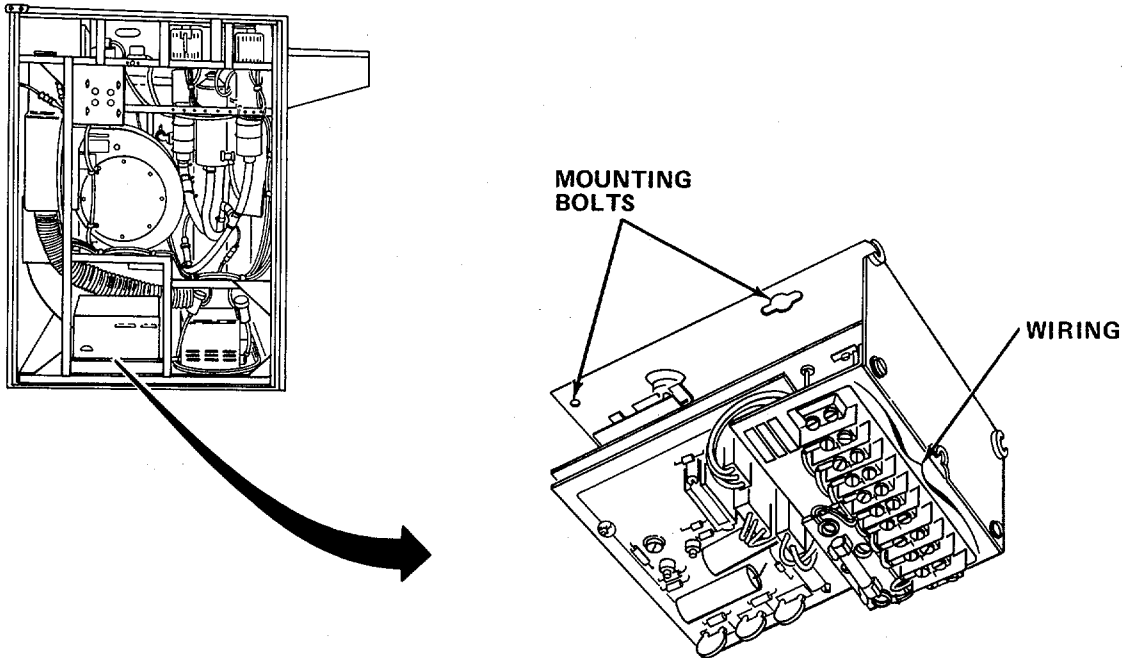
Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

1. ROLLERS DO NOT ROTATE WHEN CIRCUIT BREAKER AND MAIN DRIVE SWITCHES ARE ON - Cont

WARNING

Electrical shock hazard. You must stand on rubber matting while performing this procedure.



Step 4. Check voltage between leads 19 and 20 of control unit A1.

- (a) If approximately 110 V ac is indicated, proceed to step 5.
- (b) If voltage is not indicated, refer to higher level of maintenance.

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

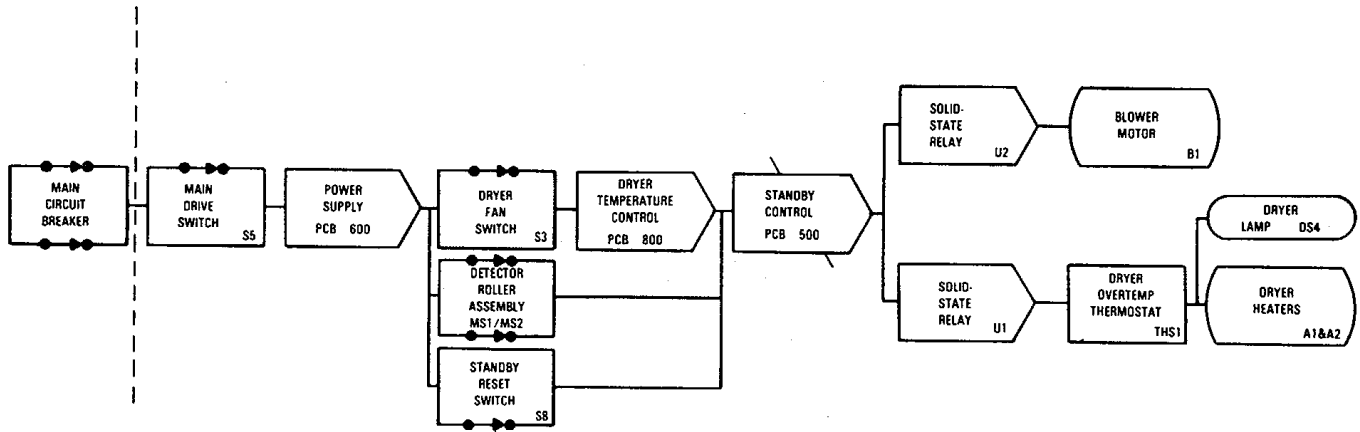
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

1. ROLLERS DO NOT ROTATE WHEN CIRCUIT BREAKER AND MAIN DRIVE SWITCHES ARE ON - Cont
 - Step 5. Check voltage between leads 26 and 27 of control unit A1.
 - (a) If 0 to 0.2 V dc is present, proceed to step 6.
 - (b) If voltage is not present, replace TRANSPORT SPEED control potentiometer (paragraph 5-16.7).
 - Step 6. Check voltage between leads 25 and 27 of control unit A1.
 - (a) If 0.6 to 4.0 V dc is present, proceed to step 7.
 - (b) If voltage is not present, replace TRANSPORT SPEED control potentiometer (paragraph 5-16.7).
 - Step 7. Check voltage between leads F1 and F2 of control unit A1.
 - (a) If 90 V dc is present, proceed to step 8.
 - (b) If voltage is not present, replace control unit A1(paragraph 5-16.29).
 - Step 8. Check voltage between leads A1 and A2 of control unit A1.
 - (a) If 0 to 132 V dc is present, proceed to step 9.
 - (b) If voltage is not present, replace control unit A1 (paragraph 5-16.29).
 - Step 9. With power off, disconnect motor leads F1 and F2 from control unit A1 and check between motor leads for continuity.
 - (a) If continuity is indicated, refer to higher level of maintenance.
 - (b) if continuity is not indicated, replace main drive motor (paragraph 5-16.14).
2. LOWER DOES NOT BLOW AIR WHEN MAIN DRIVE AND DRYER SWITCHES ARE ON, AND STANDBY FEATURE IS NOT ON.

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

2. BLOWER DOES NOT BLOW AIR WHEN MAIN DRIVE AND DRYER SWITCHES ARE ON, AND STANDBY FEATURE IS NOT ON - Cont



SEQUENCE OF OPERATION - DRYER TEMPERATURE CONTROL

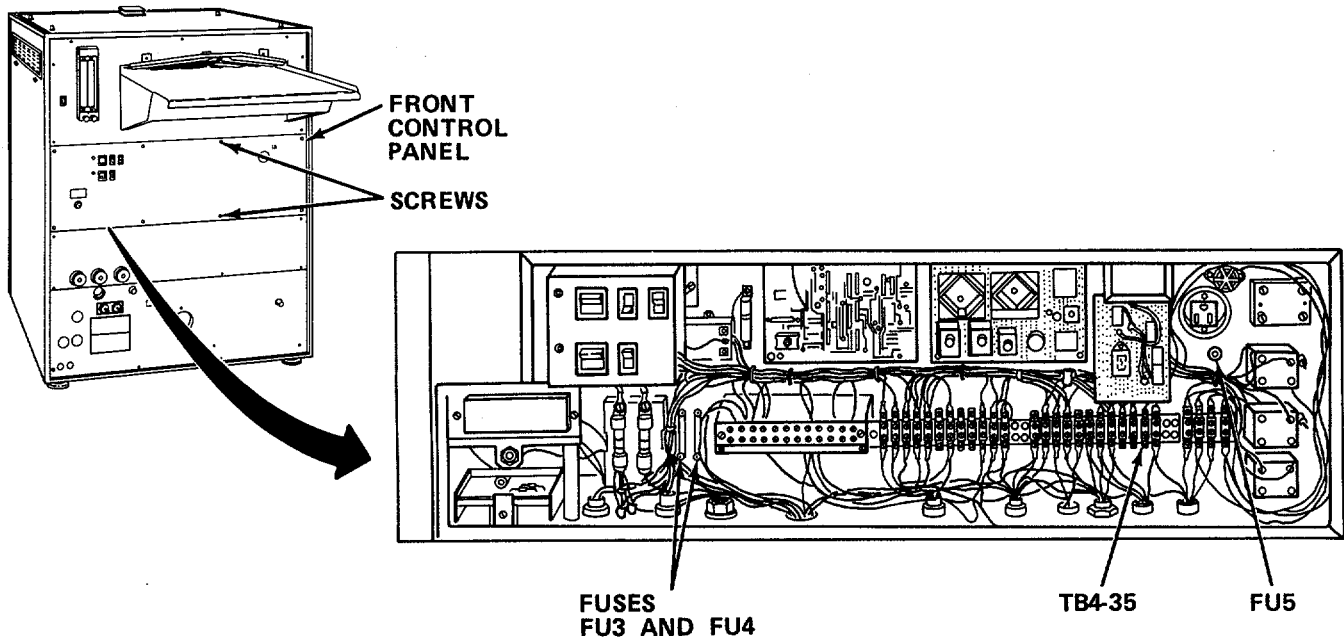
Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

2. BLOWER DOES NOT BLOW AIR WHEN MAIN DRIVE AND DRYER SWITCHES ARE ON, AND STANDBY FEATURE IS NOT ON - Cont

WARNING

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



Step 1. Check for defective fuse FU4.

- (a) If fuse is good, proceed to step 2.
- (b) If fuse is defective, replace fuse (paragraph 5-16.1).

Step 2. Check for defective fuse FU5.

- (a) If fuse is good, proceed to step 3.
- (b) If fuse is defective, replace fuse (paragraph 5-16.1).

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

2. BLOWER DOES NOT BLOW AIR WHEN MAIN DRIVE AND DRYER SWITCHES ARE ON, AND STANDBY FEATURE IS NOT ON - Cont

WARNING

Electrical shock hazard. You must stand on rubber matting while performing this procedure.

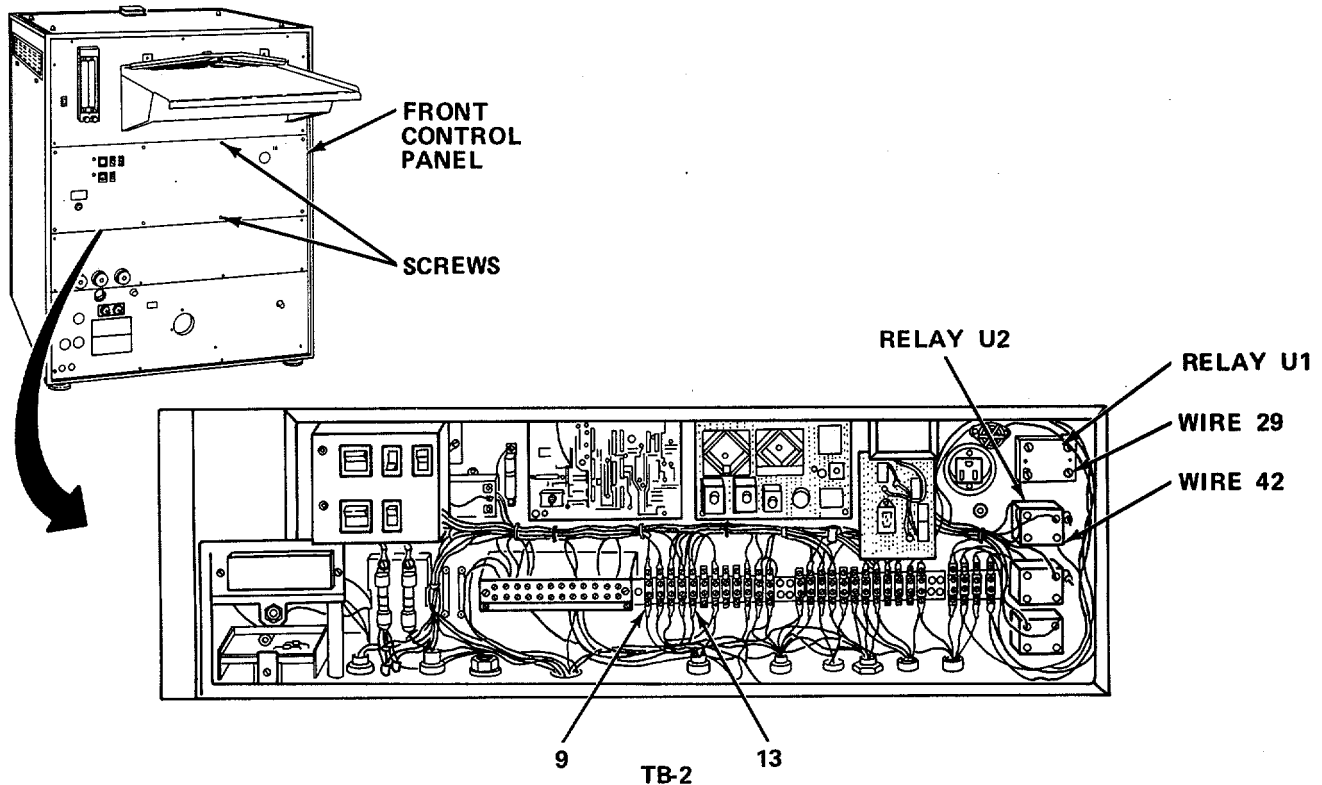
Step 3. Check voltage between terminal board connector 4-34 and ground.

- (a) If 12 V dc is present, proceed to step 4.
- (b) If voltage is not present, replace DRYER and DEV. HEAT switch (paragraph 5-16.5).

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

2. BLOWER DOES NOT BLOW AIR WHEN MAIN DRIVE AND DRYER SWITCHES ARE ON, AND STANDBY FEATURE IS NOT ON - Cont



Step 4. With power on, and standby feature not energized, check voltage between wire 42 on relay U2 and ground.

- (a) If 2.0 or 12 V dc is present, proceed to step 5.
- (b) If voltage is not present, replace standby control circuit board 500 (paragraph 5-16.4).

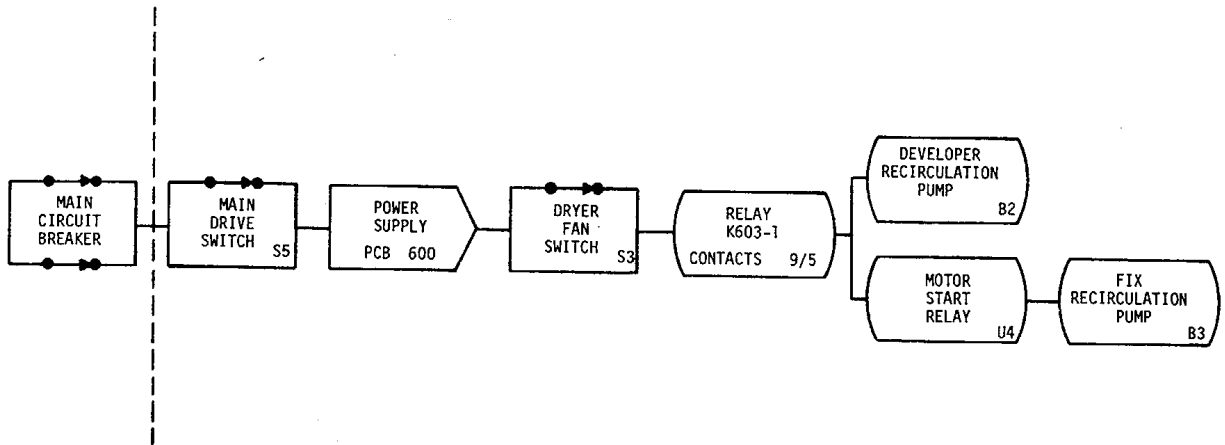
Step 5. Check voltage between terminal block connectors 2-13 and 2-9.

- (a) If 120 V ac is present, replace relay U2 (paragraph 5-16.26).
- (b) If voltage is not present, replace blower motor (paragraph 5-16.19).

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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- RECIRCULATION PUMPS DO NOT OPERATE WHEN MAIN DRIVE AND DRYER AND DEV. HEAT SWITCHES ARE ON. BLOWER OPERATES.



SEQUENCE OF OPERATION - RECIRCULATION

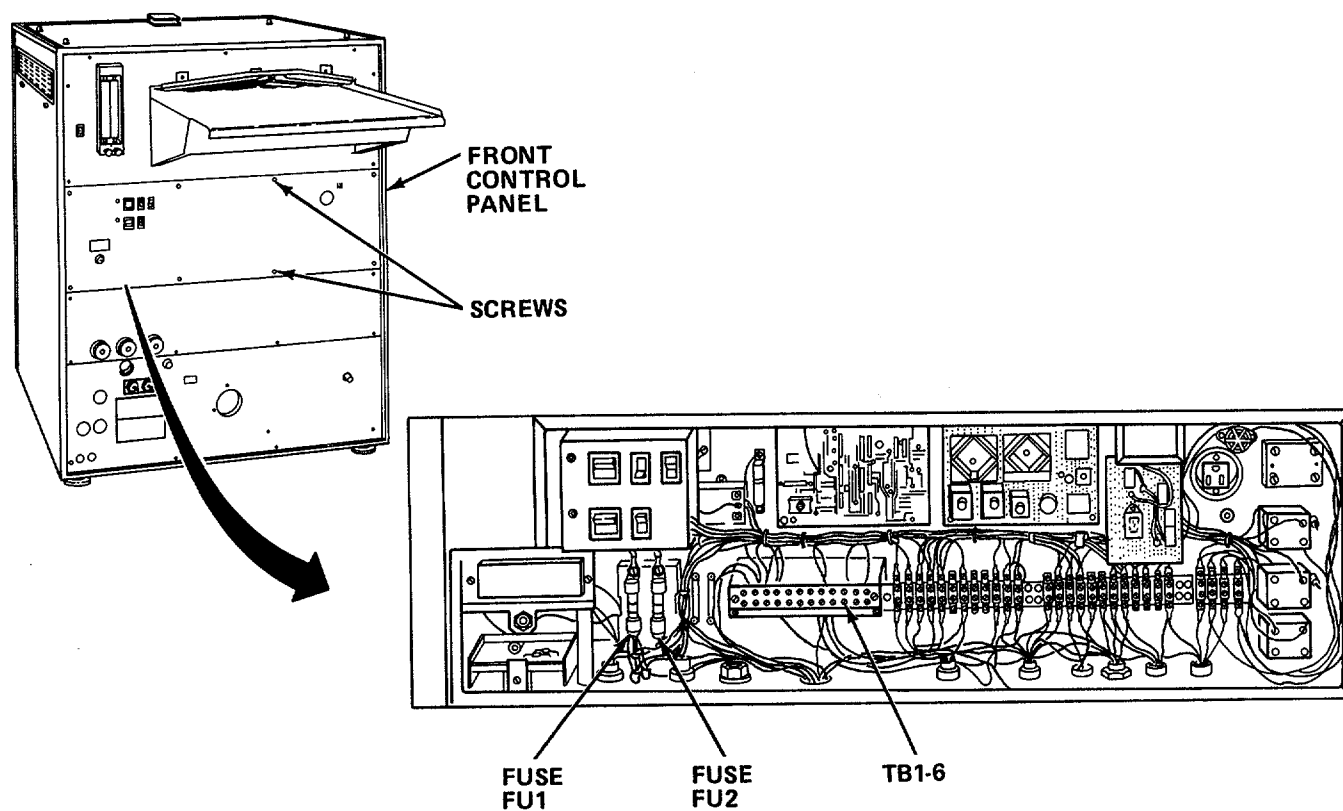
Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

3. RECIRCULATION PUMPS DO NOT OPERATE WHEN MAIN DRIVE AND DRYER AND DEV. HEAT SWITCHES ARE ON. BLOWER OPERATES - Cont

WARNING

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



Step 1. Check for defective fuse FU1.

- (a) If fuse is good, proceed to step 2.
- (b) If fuse is defective, replace fuse (paragraph 5-16.1).

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

3. RECIRCULATION PUMPS DO NOT OPERATE WHEN MAIN DRIVE AND DRYER AND DEV. HEAT SWITCHES ARE ON. BLOWER OPERATES - Cont

Step 2. Check for defective fuse FU2.

- (a) If fuse is good, proceed to step 3.
- (b) If fuse is open, replace fuse (paragraph 5-16.1).

WARNING

Electrical shock hazard. You must stand on rubber matting while performing this procedure.

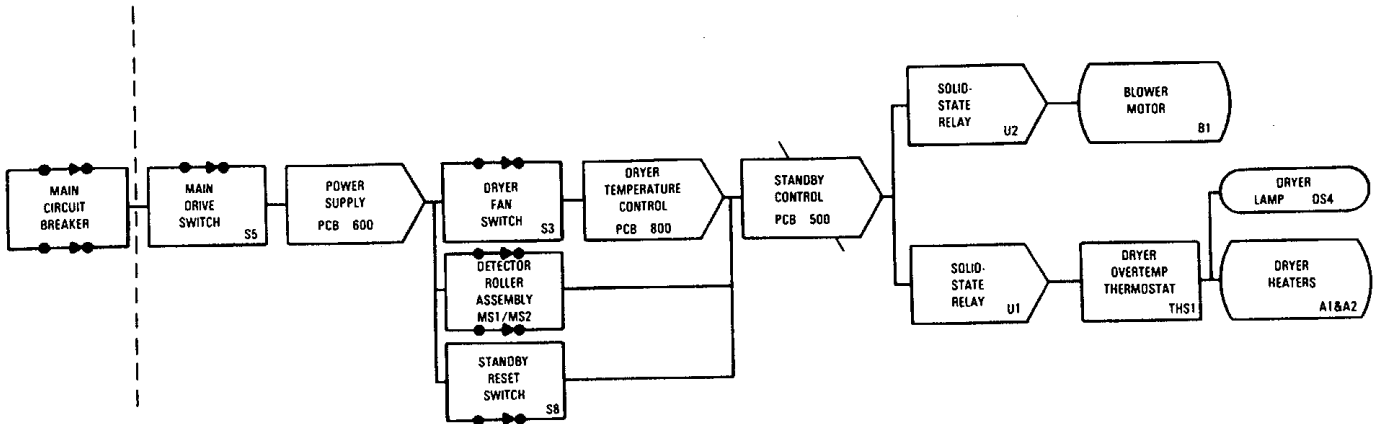
Step 3. Check voltage between terminal block connector 1-6 and ground.

- (a) If 120 V ac is present, refer to direct support/general support maintenance for repair of recirculation pump.
- (b) If voltage is not present, replace power supply circuit board 600 (paragraph 5-16.4).
- (c) If malfunction persists, refer to direct/general support maintenance.

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

4. DRYER HEATER DOES NOT WARM DRYING AIR. ROLLERS ROTATE.



SEQUENCE OF OPERATION - DRYER TEMPERATURE CONTROL

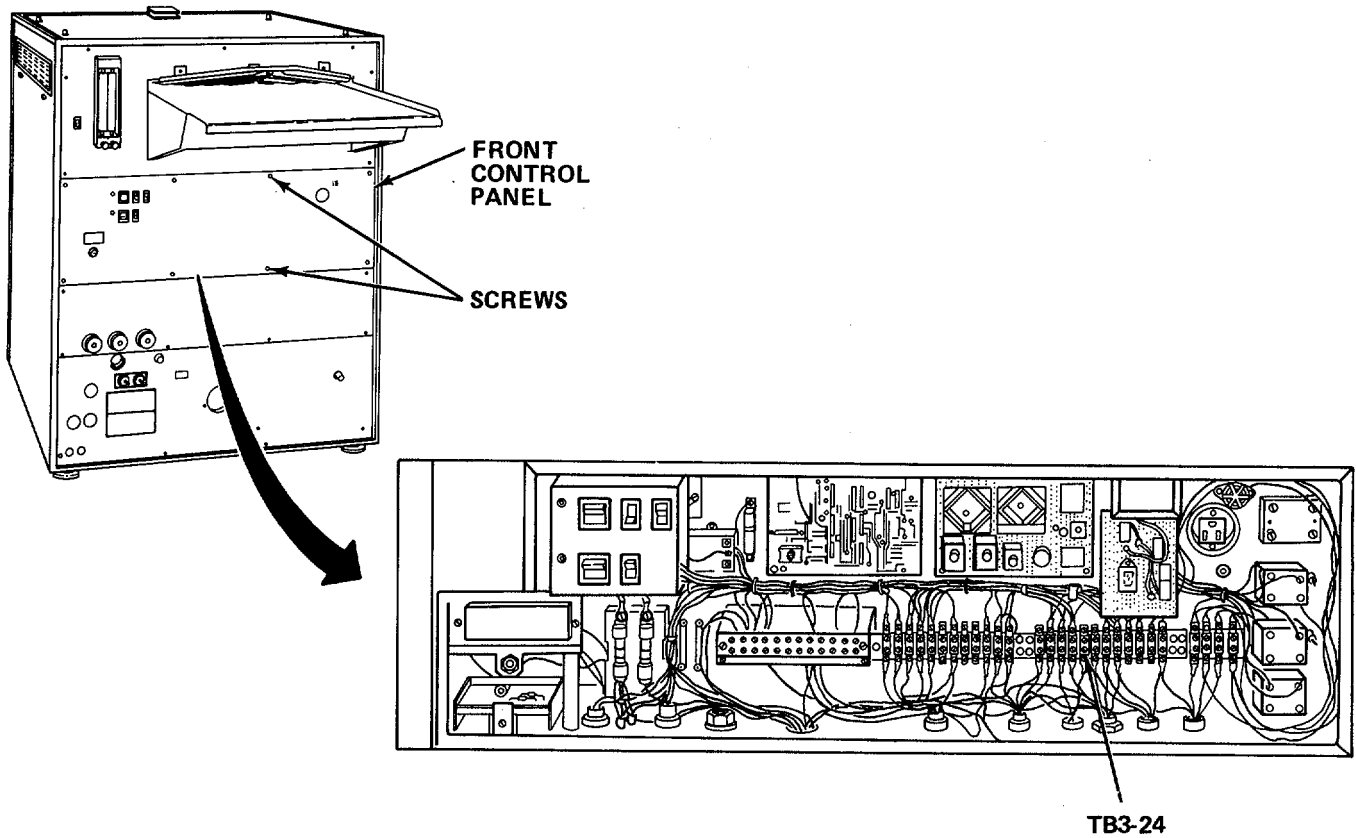
Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

4. DRYER HEATER DOES NOT WARM DRYING AIR. ROLLERS ROTATE - Cont

WARNING

Electrical shock hazard. You must stand on rubber matting while performing this procedure.



Step 1. Check voltage between terminal block connector 3-24 and ground.

- (a) If 120 V ac is present, proceed to step 2.
- (b) If voltage is not present, proceed to step 6.

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

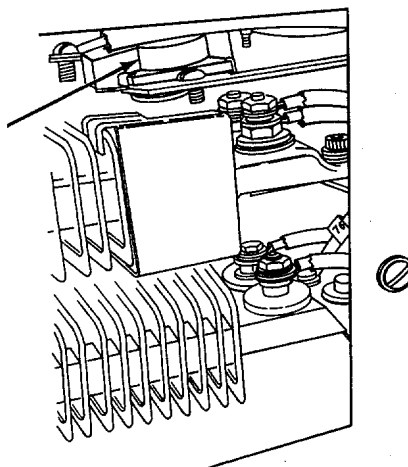
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

4. DRYER HEATER DOES NOT WARM DRYING AIR. ROLLERS ROTATE - Cont

WARNING

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

**OVERTEMPERATURE
THERMOSTAT**



Step 2. Turn power off and check continuity of dryer overtemperature thermostat.

- (a) If continuity is present, proceed to step 3.
- (b) If continuity is not present, replace dryer overtemperature thermostat (paragraph 5-16.16).

Step 3. With multimeter on lowest resistance scale, check continuity of dryer heater.

- (a) If continuity is present, proceed to step 4.
- (b) If continuity is not present, replace dryer heater (paragraph 5-16.15).

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

4. DRYER HEATER DOES NOT WARM DRYING AIR. ROLLERS ROTATE - Cont

WARNING

Electrical shock hazard. You must stand on rubber matting before performing this procedure.

Step 4. Turn power on. Check voltage between terminal block connector 4-34 and ground. MAIN DRIVE switch must be on.

- (a) If 12 V dc is present, proceed to step 5.
- (b) If voltage is not present, replace power supply circuit board 600 (paragraph 5-16. 4).

Step 5. Check voltage between terminal block connector 3-24 and ground.

- (a) If voltage is not present, refer to higher level of maintenance.
- (b) If 12 V dc is present, replace dryer temperature control circuit board 800 (paragraph 5-16.9).

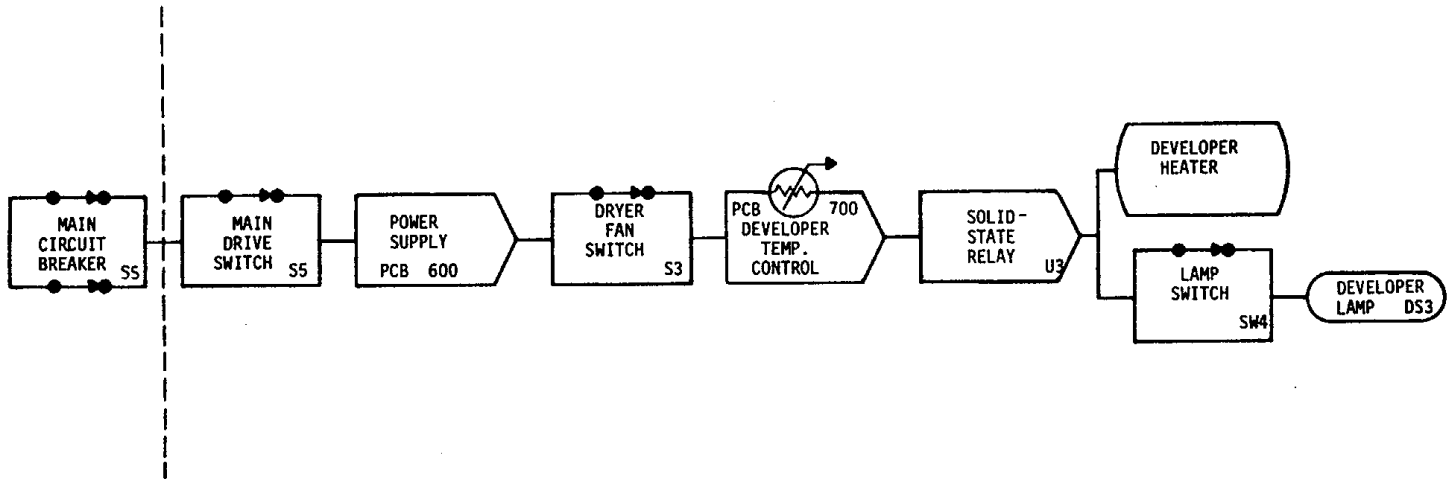
Step 6. Check voltage between wire 29 on relay U1 and ground. (Refer to F04 Processor Wiring Diagram.)

- (a) If 12 V dc is present, replace standby control circuit board 500 (paragraph 5-16.4).
- (b) If voltage is not present, replace U1 (paragraph 5-16. 26).

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

- DEVELOPER HEATER DOES NOT WARM DEVELOPER SOLUTION. ROLLERS ROTATE AND DRYER BLOWER MOVES AIR.



SEQUENCE OF OPERATION - DEVELOPER TEMPERATURE CONTROL

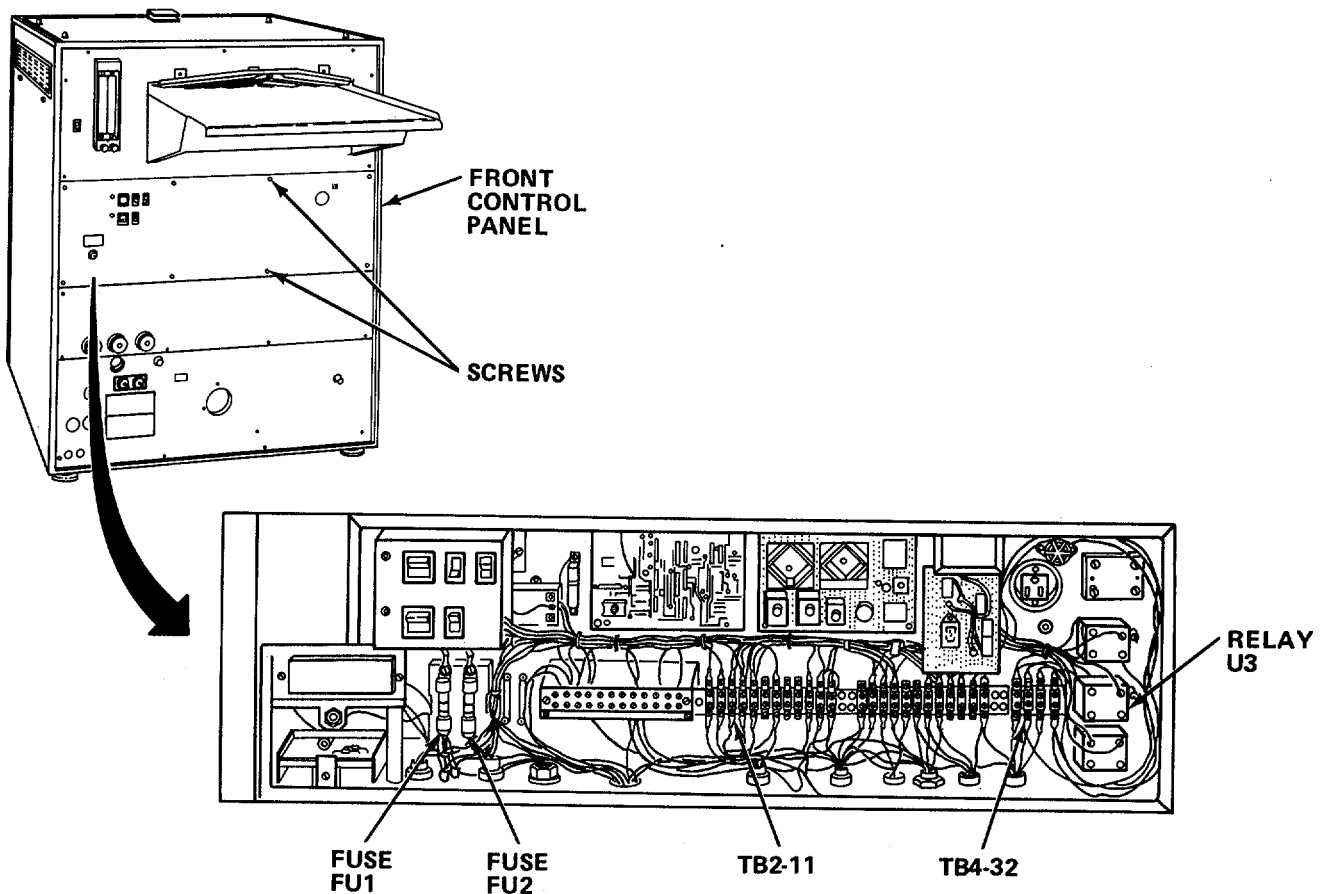
Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

5. DEVELOPER HEATER DOES NOT WARM DEVELOPER SOLUTION. ROLLERS ROTATE AND DRYER BLOWER MOVES AIR - Cont

WARNING

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



Step 1. Check for defective fuse FU1.

- (a) If fuse is good, proceed to step 2.
- (b) If fuse is defective, replace fuse (paragraph 5-16.1).

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

5. DEVELOPER HEATER DOES NOT WARM DEVELOPER SOLUTION. ROLLERS ROTATE AND DRYER BLOWER MOVES AIR - Cont

Step 2. Check for defective fuse FU2.

- (a) If fuse is good, proceed to step 3.
- (b) If fuse is defective, replace fuse (paragraph 5-16.1).

WARNING

Electrical shock hazard. You must stand on rubber matting while performing this procedure.

Step 3. Check voltage between terminal block connector 2-11 and ground.

- (a) If 120 V ac is present, replace developer heater (paragraph 5-16. 27).
- (b) If voltage is not present, proceed to step 4.

Step 4. Check voltage between terminal block connector 4-32 and ground.

- (a) If 12 V dc is present, proceed to step 5.
- (b) If voltage is not present, replace power supply circuit board 600 (paragraph 5-16. 4).

Step 5. Check voltage between terminal block connector 4-33 and ground.

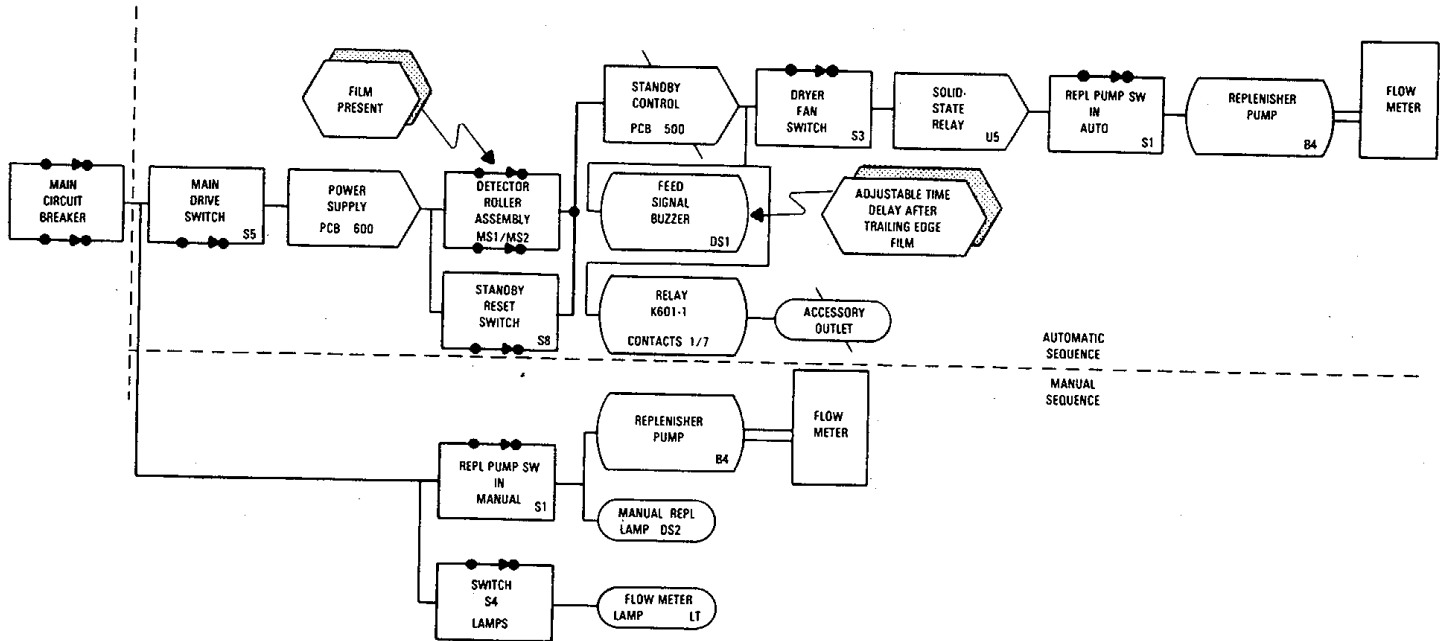
- (a) If 12 V dc is present, replace developer temperature control circuit board 700 (paragraph 5-16. 8).
- (b) If voltage is not present, replace relay U3 (paragraph 5-16. 26).

6. REPLENISH PUMP DOES NOT ACTIVATE WHEN FILM IS FED. MAIN DRIVE SWITCH IS ON AND REPL PUMPS SWITCH IS IN AUTO.

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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6. REPLENISHER PUMP DOES NOT ACTIVATE WHEN FILM IS FED. MAIN DRIVE SWITCH IS ON AND REPL PUMPS SWITCH IS IN AUTO - Cont



SEQUENCE OF OPERATION - REPLENISHMENT

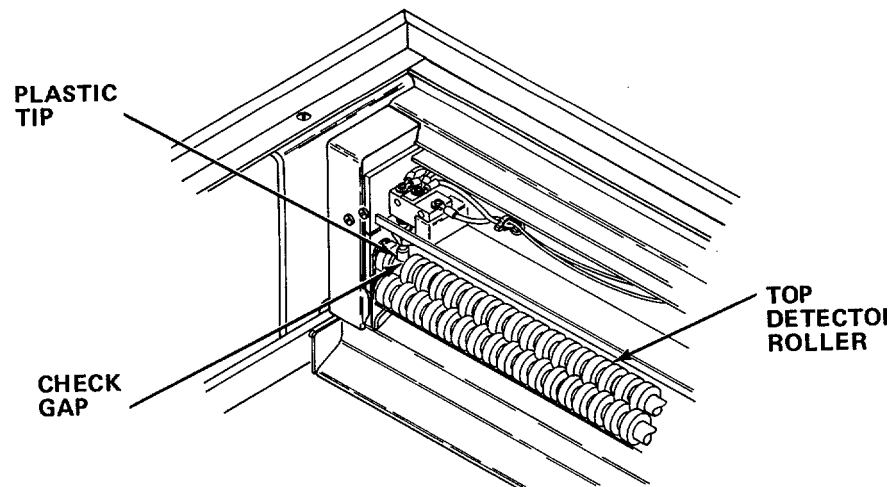
Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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6. REPLENISHER PUMP DOES NOT ACTIVATE WHEN FILM IS FED. MAIN DRIVE SWITCH IS ON AND REPL PUMPS SWITCH IS IN AUTO - Cont

WARNING

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



Step 1. Check film detector crossover switches.

- (a) If gap is .020 to .025 in (.5 to .6 mm), proceed to step 2.
- (b) If gap is not correct, adjust detector crossover switches (Table 5-3, Item 1).

Step 2. Check for defective fuse FU1.

- (a) If fuse is good, proceed to step 3.
- (b) If fuse is open, replace fuse (paragraph 5-16.1)

Step 3. Check for defective fuse FU2.

- (a) If fuse is good, proceed to step 4.
- (b) If fuse is open, replace fuse (paragraph 5-16.1).

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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6. REPLENISHER PUMP DOES NOT ACTIVATE WHEN FILM IS FED. MAIN DRIVE SWITCH IS ON AND REPL PUMPS SWITCH IS IN AUTO - Cont

Step 4. Check for defective fuse FU4.

- (a) If fuse is good, proceed to step 5.
- (b) If fuse is open, replace fuse (paragraph 5-16.1).

Step 5. Check for defective fuse FU5.

- (a) If fuse is good, proceed to step 6.
- (b) If fuse is open, replace fuse (paragraph 5-16.1).

WARNING

Electrical shock hazard. You must stand on rubber matting while performing this procedure.

Step 6. Check voltage between terminal block connectors 2-19 and 3-23.

- (a) If 120 V ac is present, proceed to step 7.
- (b) If voltage is not present, replace MAIN DRIVE switch (paragraph 5-16.5).

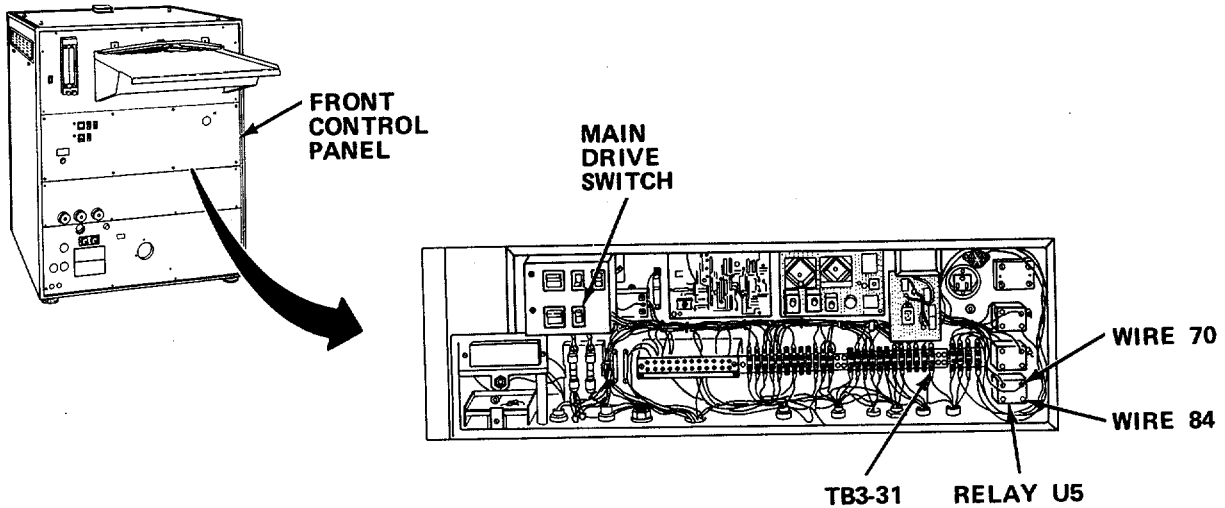
Step 7. Check voltage between terminal block connector 4-34 and ground.

- (a) If 12 V dc is present, proceed to step 8.
- (b) If voltage is not present, replace power supply circuit board 600 (paragraph 5-16.4).

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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6. REPLENISH PUMP DOES NOT ACTIVATE WHEN FILM IS FED. MAIN DRIVE SWITCH IS ON AND REPL PUMPS SWITCH IS IN AUTO - Cont



Step 8. Actuate detector switches, one at a time, while checking voltage between terminal block connector 3-31 and ground.

- (a) If voltage is 2.0 V dc or less, proceed to step 9.
- (b) If voltage is 12 V dc, replace defective detector switch (paragraph 5-16.11).

Step 9. With both detector switches actuated, check voltage between wire 84 on relay U5 and ground.

- (a) If 2.0 V dc or less is present, proceed to step 10.
- (b) If 12 V dc is present, replace standby control circuit board 500 (paragraph 5-16.4).

Table 5-5. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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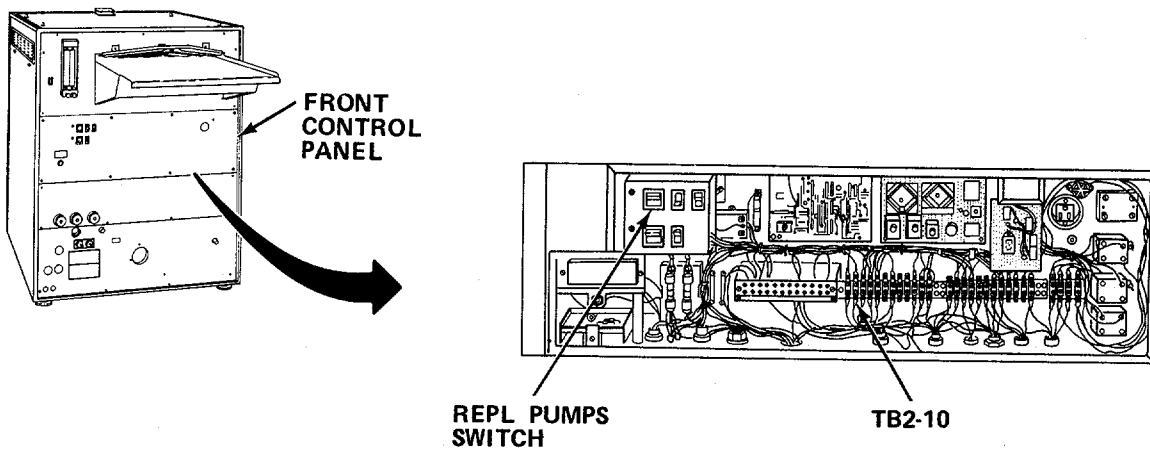
6. REPLENISHER PUMP DOES NOT ACTIVATE WHEN FILM IS FED. MAIN DRIVE SWITCH IS ON AND REPL PUMPS SWITCH IS IN AUTO Cont

Step 10. Check voltage between terminal block connector 2-13 and ground.

- (a) If 120 V ac is present, proceed to step 11.
- (b) If voltage is not present, refer to higher level of maintenance.

Step 11. With detector switches actuated, check voltage between terminal block connectors 2-13 and wire 70 on relay U5.

- (a) If voltage is not present, proceed to step 12.
- (b) If 120 V ac is present, replace relay U5 (paragraph 5-16. 26).



Step 12. With detector switches actuated and REPL PUMPS switch in AUTO, check voltage between terminal block connector 2-10 and ground.

- (a) If 120 V ac is present, refer to direct support/general support maintenance for repair of replenisher pump.
- (b) If voltage is not present, replace REPL PUMPS switch (paragraph 5-16. 5).

5-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the film processor. 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

PROCEDURE	PARAGRAPH
Replace Fuse	5-16.1
Adjust Feed Signal Timer	5-16.2
Service and Repair Flowmeter	5-16.3
Replace Circuit Boards 500, 600, 900, 1000	5-16.4
Replace Switches	5-16.5
Replace SPEED METER	5-16.6
Replace TRANSPORT SPEED Control Potentiometer	5-16.7
Replace Developer Temperature Control Circuit Board 700	5-16.8
Replace Dryer Temperature Control Circuit Board 800	5-16.9
Replace Top Cover Interlock Switch	5-16.10
Replace Detector Switch	5-16.11
Replace Control Unit Fuse	5-16.12
Replace Drive Motor Generator Assembly	5-16.13
Replace Drive Motor	5-16.14
Replace Dryer Heater	5-16.15
Replace Dryer Heater Overtemperature Thermostat	5-16.16
Replace Heater/Recirculating Pump/Sump Pump Switch(es)	5-16.17
Replace Hoses	5-16.18
Replace Blower Motor	5-16.19
Replace Recirculation Tank Heating Element	5-16.20

INDEX - Cont

PROCEDURE	PARAGRAPH
Replace Recirculation Tank Thermostat	5-16.21
Replace Recirculation Pump	5-16.22
Replace Sump Pump	5-16.23
Replace 12 Volt Power Supply	5-16.24
Replace Chiller	5-16.25
Replace Relays	5-16.26
Replace Developer Heater	5-16.27
Replace Developer Heater Overtemperature Thermostat	5-16.28
Replace Control Unit AI	5-16.29
Replace Developer and Fixer Recirculation Pump Assemblies	5-16.30
Remove/Install Processor	5-16.31

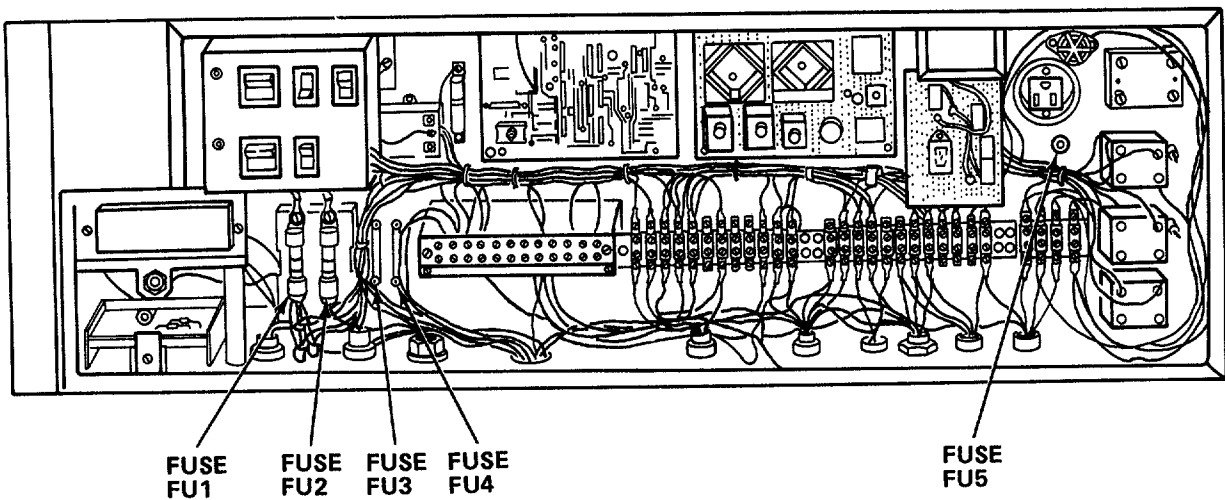
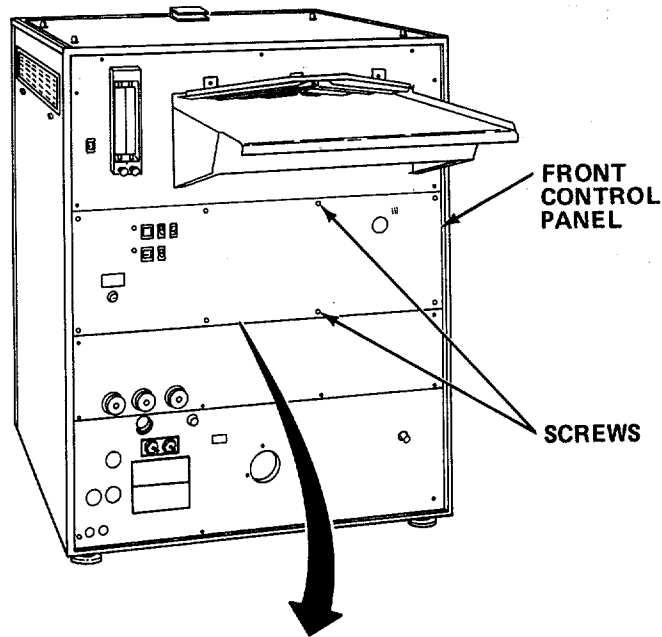
5-16.1 Replace Fuse.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

- Tool Kit, Light Machine Repair
- Flat Tip Screwdriver
- Socket Head Key Wrench Set
- Fuse Puller

- SUPPLIES:
- Fuse (15 amp)
 - Fuse (3 amp)
 - Fuse (5 amp)



WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.
- b. Turn on MAIN DRIVE switch to ensure equipment is de-energized.
- c. Remove knob from TRANSPORT SPEED control.
- d. Remove front control panel retaining screws and washers.
- e. Remove front control panel.
- f. Replace defective fuse.
- g. Reinstall front control panel, and secure with screws and washers.
- h. Reinstall TRANSPORT SPEED control knob.
- i. Turn off MAIN DRIVE switch.
- j. Turn on processor circuit breaker.

5-16.2 Adjust Feed Signal Timer.

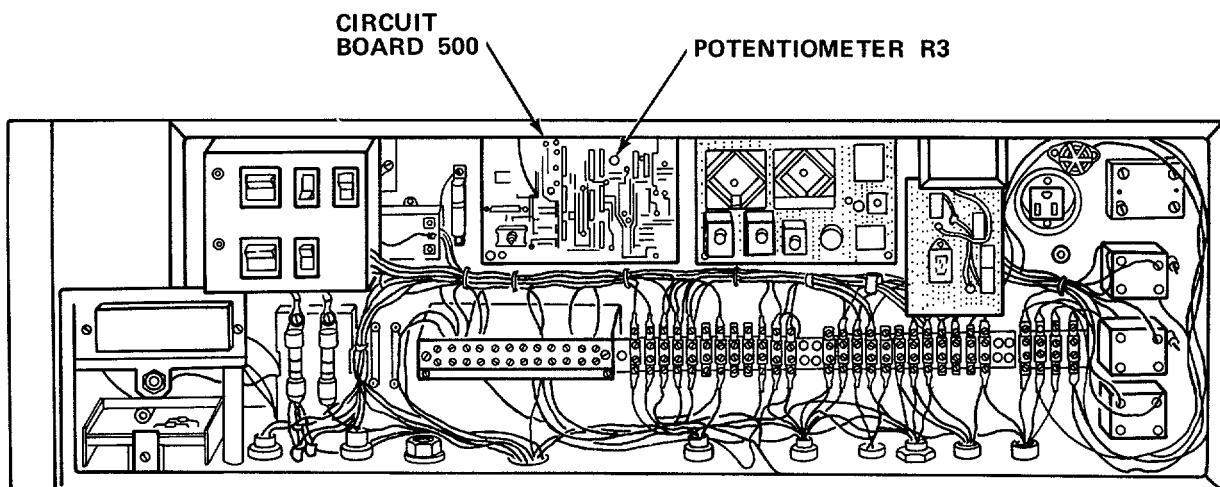
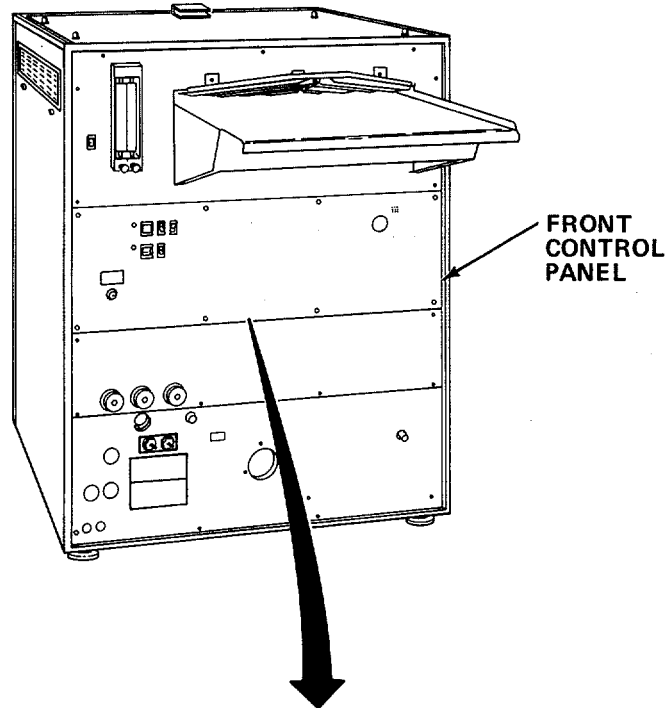
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair

Flat Tip Screwdriver

Nonmetallic Flat Tip Screwdriver



- a. Remove knob from TRANSPORT SPEED control.
- b. Remove retaining screws and front control panel.
- c. Locate circuit board 500.
- d. Locate potentiometer R3 on circuit board 500.

NOTE

Turn potentiometer adjusting screw right to increase delay time, and left to decrease delay time.

- e. Turn potentiometer R3 to set desired time delay.
- f. Reinstall front control panel and TRANSPORT SPEED control knob, and retain with screws.

5-16.3 Service and Repair Flowmeter.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

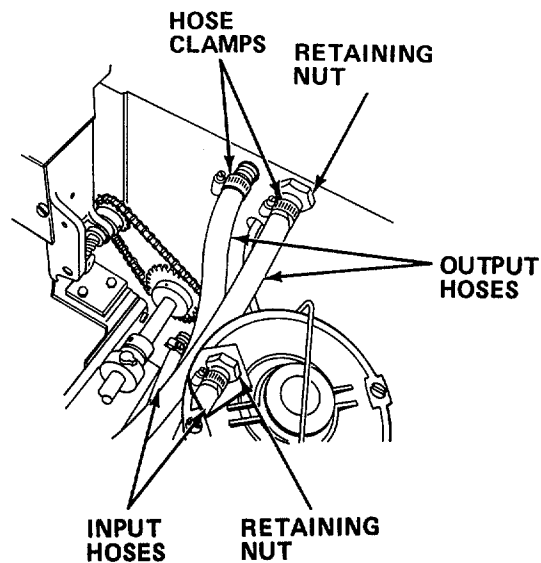
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Socket Head Key Wrench Set
 Pliers
 Combination Wrench Set
 Tube Cleaning Brush

SUPPLIES: Flowmeter Tube Kit (Developer and Fixer)
 Valve Assembly O-rings

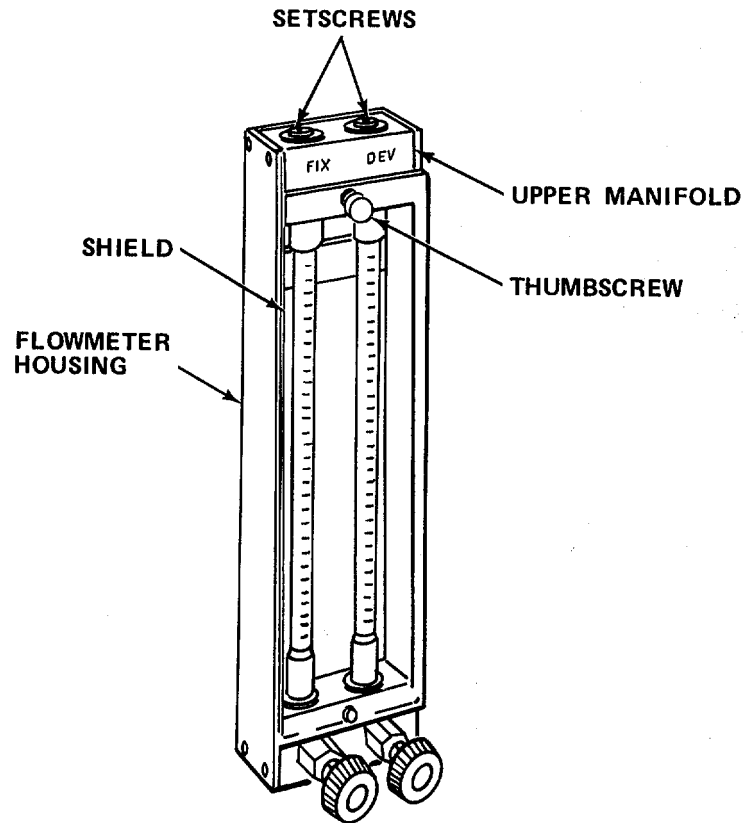
WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing flowmeter.

- a. Turn off processor circuit breaker.
- b. Disconnect quick-release valves on replenishment tanks.
- c. Remove left access panel and top cover from processor.
- d. Remove fixer and developer pump cover.
- e. Remove guard over flowmeter outlets.



- f. Remove hose clamps. Tag and disconnect input and output hoses from rear of flowmeter.
- g. Remove two retaining nuts. Carefully pull top of flowmeter away from front of processor.

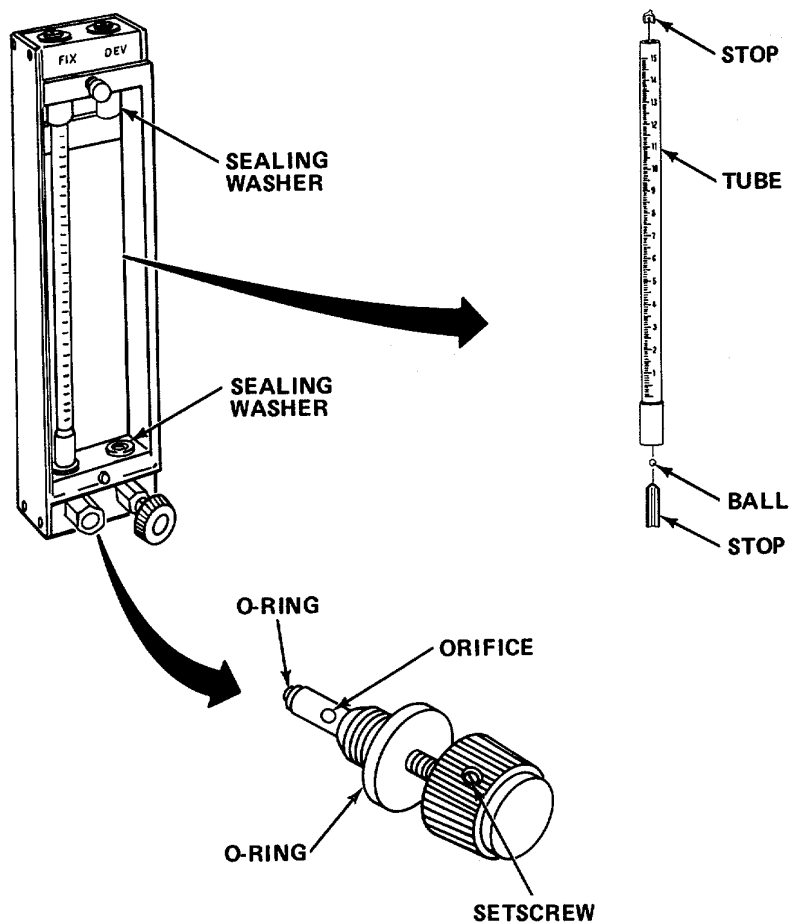


- h. Loosen thumbscrew and remove flowmeter shield.

CAUTION

To prevent equipment breakage, hold glass tubes while loosening setscrews.

- i. Loosen setscrews on top of upper manifold, and remove flowmeter tubes from housing. Remove washers, stops, and balls.



- j. Inspect sealing washers. Replace if defective.
- k. Clean sealing washers, stops, and balls in warm water.
- l. Clean flowmeter tubes with warm water and tube cleaning brush.
- m. Loosen setscrews and remove knobs from control valves.
- n. Remove control valves from flowmeter.
- o. Remove 0-rings from control valves. Discard 0-rings.
- p. Install new 0-rings, and reinstall control valves in flowmeter.
- q. Reinstall knobs on control valves and tighten setscrews.
- r. Reinstall balls, stops, and washers.

CAUTION

To prevent glass tube breakage, do not overtighten setscrews.

- s. Reinstall flowmeter tubes to housing with numbers easily legible. Secure tubes by tightening setscrews.
- t. Reinstall shield and tighten thumbscrew.
- u. Reinstall flowmeter to front of processor and secure with retaining nuts.
- v. Reconnect input and output hoses. Secure with hose clamps.
- w. Reconnect quick-release valves on replenishment tanks.
- x. Determine initial flowmeter characteristics (Table 5-1, Item 19).
- y. Replace guard over flowmeter outlets.
- z. Reinstall fixer and developer pump cover.
- aa. Reinstall top cover and left access panel.
- ab. Turn on processor circuit breaker.

5-16.4 Replace Circuit Boards 500, 600, 900, 1000.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

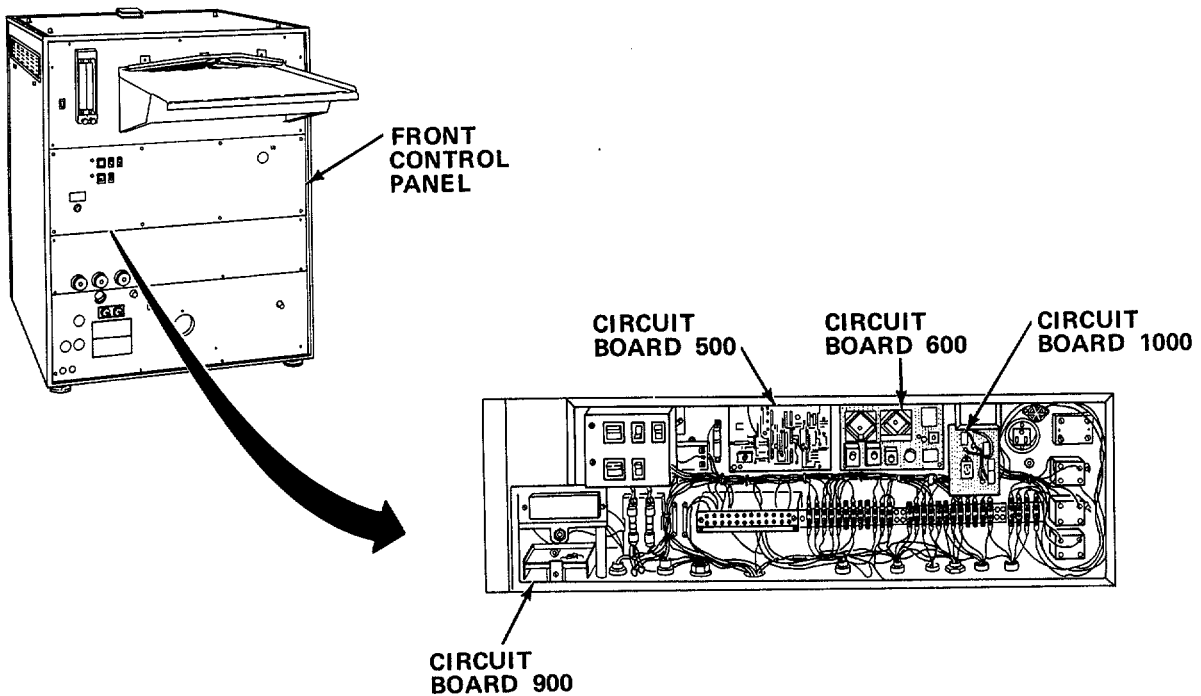
Tool Kit, Electronic Repair
 Socket Head Key Wrench Set
 Flat Tip Screwdriver

SUPPLIES: Standby Control Circuit Board 500
 Power Supply Circuit Board 600
 Meter Control Circuit Board 900
 Water Control Circuit Board 1000

WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.
- b. Loosen setscrew and remove TRANSPORT SPEED control knob.
- c. Remove screws and front control panel.



NOTE

For removal of circuit board 900, perform steps a through h. For removal of circuit boards 500, 600, and 1000, perform steps a through c and steps i through o.

- d. Remove retaining screw, bracket, and circuit board 900.
- e. Tag and disconnect wires from circuit board.
- f. Reconnect wires onto new circuit board.
- g. Install new circuit board and retain with screw and bracket.
- h. Reinstall front panel and TRANSPORT SPEED control knob. Tighten setscrew securely.
- i. Tag and disconnect wire connectors from circuit board.
- j. Remove retaining screws from corners of circuit board. Circuit board 600 has an additional screw in right center.
- k. Install new circuit board and retain with screws.
- l. Plug in wire connectors in their correct positions.
- m. Reinstall front control panel.
- n. Reinstall TRANSPORT SPEED control knob. Tighten setscrew securely.
- o. Turn processor circuit breaker ON.

5-16.5 Replace Switches.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

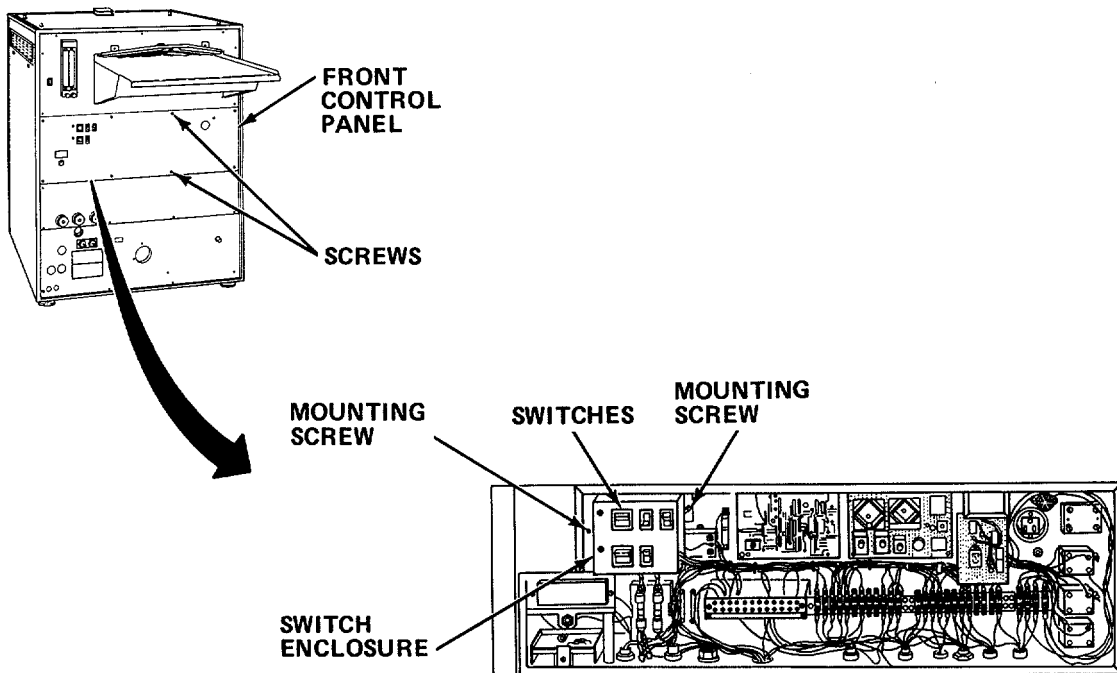
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Socket Head Key Wrench Set

SUPPLIES: Switch S1
 Switch S2
 Switch S3
 Switch S4
 Switch S5

WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.



- b. Loosen setscrew and remove TRANSPORT SPEED control knob.
- c. Remove screws and front control panel.
- d. Remove mounting screws and switch enclosure.
- e. Tag and disconnect wiring from defective switch.
- f. Remove switch from enclosure by depressing retaining clips and sliding through enclosure.
- g. Replace switch into enclosure. Reconnect wiring to proper position.

NOTE

Be sure ground wire is reconnected to enclosure mounting screw.

- h. Reinstall switch enclosure and ground wire. Retain with screws.
- i. Reinstall front control panel and retain with screws.
- j. Reinstall TRANSPORT SPEED control knob and tighten setscrew.
- k. Turn on processor circuit breaker.

5-16.6 Replace SPEED METER.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

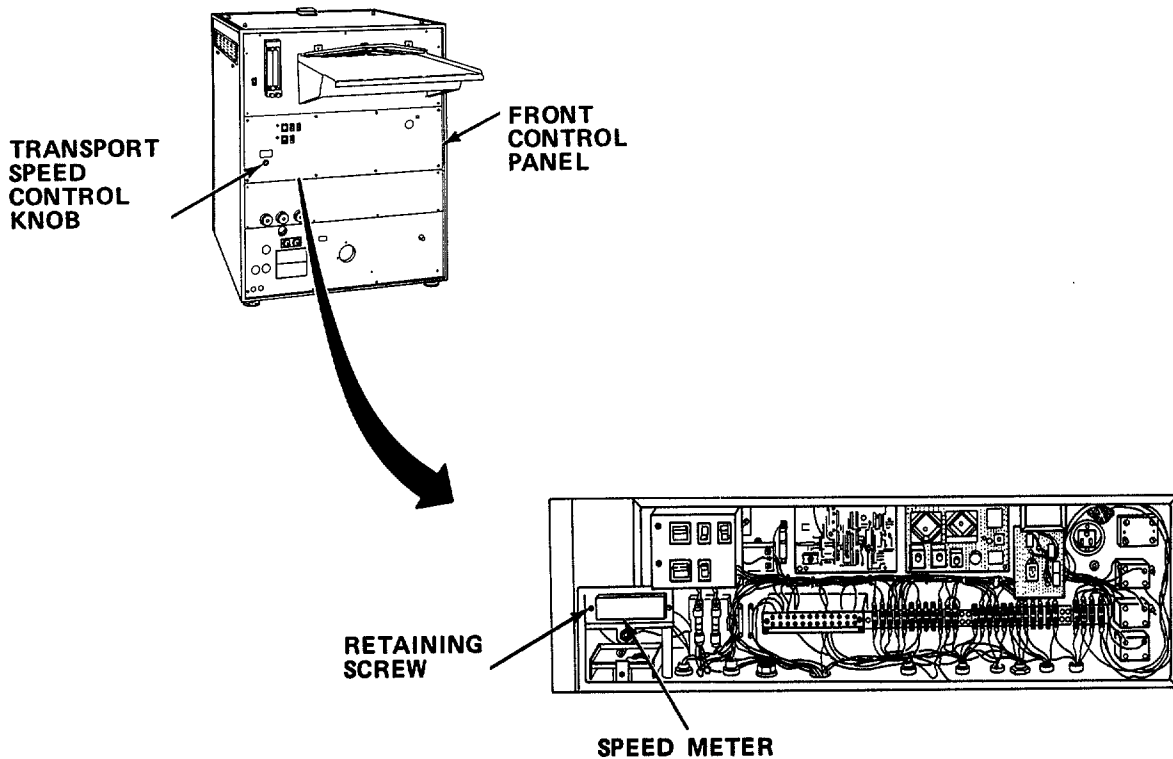
Tool Kit, Electronic Repair
 Flat Tip Screwdriver
 Socket Head Key Wrench Set
 Combination Wrench Set

SUPPLIES: Speed Meter

WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.
- b. Loosen setscrew and remove TRANSPORT SPEED control knob.
- c. Remove screws and front control panel.



- d. Remove retaining screws and SPEED METER.

NOTE

Note position of plug to ensure proper reassembly.

- e. Unplug wiring from rear of SPEED METER.
- f. Reconnect plug to new SPEED METER.
- g. Install SPEED METER into housing and retain with screws.
- h. Reinstall front control panel and retain with screws.
- i. Reinstall TRANSPORT SPEED control knob and tighten setscrew.
- j. Turn on processor circuit breaker.

5-16.7 Replace TRANSPORT SPEED Control Potentiometer.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

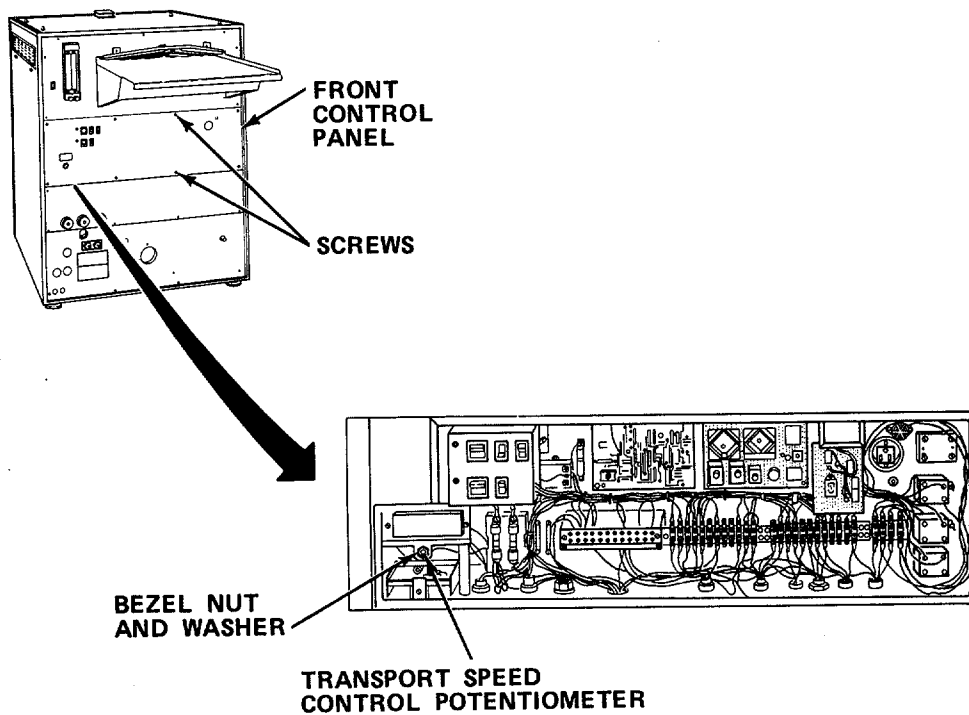
- Tool Kit, Electronic Repair
- Flat Tip Screwdriver
- Socket Head Key Wrench Set
- Combination Wrench Set
- Soldering Iron
- Solder

SUPPLIES: Transport Speed Control Potentiometer

WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.



- b. Loosen setscrew and remove TRANSPORT SPEED control knob.
- c. Remove screws and front control panel.
- d. Remove bezel nut, washer, and TRANSPORT SPEED control potentiometer.
- e. Tag and desolder wiring from potentiometer.
- f. Resolder wiring to new potentiometer in proper positions.
- g. Install potentiometer into bracket and retain with washer and bezel nut.
- h. Reinstall front control panel and retain with screws.
- i. Reinstall TRANSPORT SPEED control knob and tighten setscrew.
- j. Turn on processor circuit breaker.

5-16.8 Replace Developer Temperature Control Circuit Board 700.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

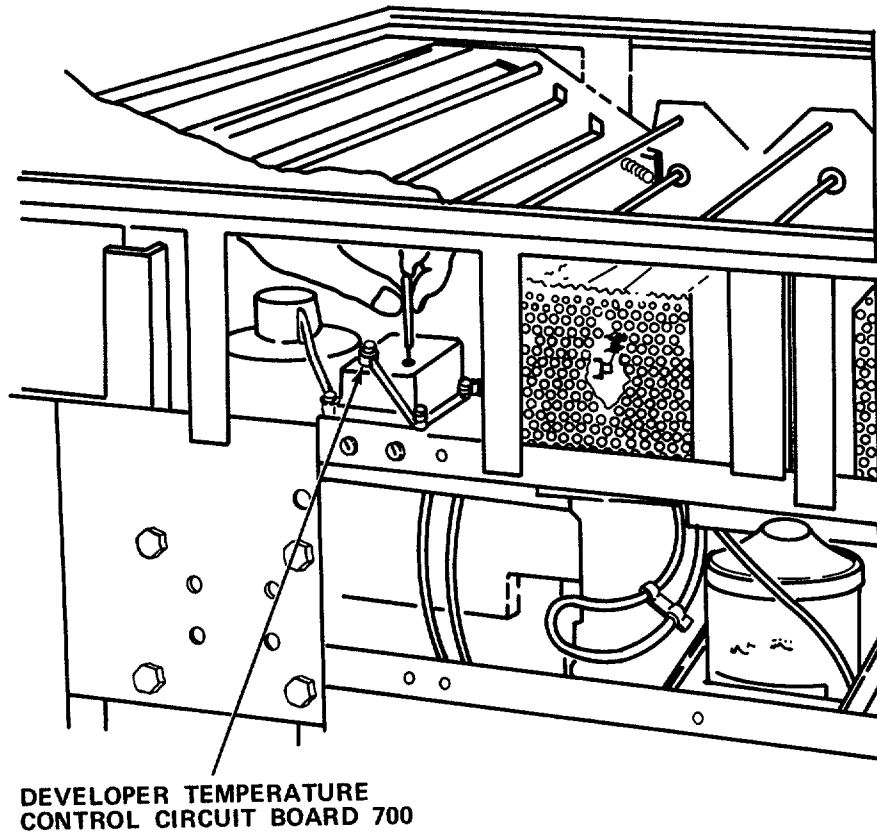
Tool Kit, Electronic Repair
Flat Tip Screwdriver
Cross Tip Screwdriver

SUPPLIES: Developer Temperature Control Circuit Board 700

WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.



- b. Remove left access panel and top cover.
- c. Remove fixer and developer pump cover.
- d. Remove four circuit board cover mounting screws.
- e. Tag and disconnect wiring from circuit board.
- f. Remove circuit board.
- g. Install new circuit board.
- h. Reconnect wiring to circuit board.
- i. Reinstall circuit board cover to bracket and retain with four screws.
- j. Turn on processor circuit breaker.
- k. Adjust developer temperature (refer to Table 5-3, Item 2).
- l. Reinstall left access panel, pump cover, and top cover.

5-16.9 Replace Dryer Temperature Control Circuit Board 800.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

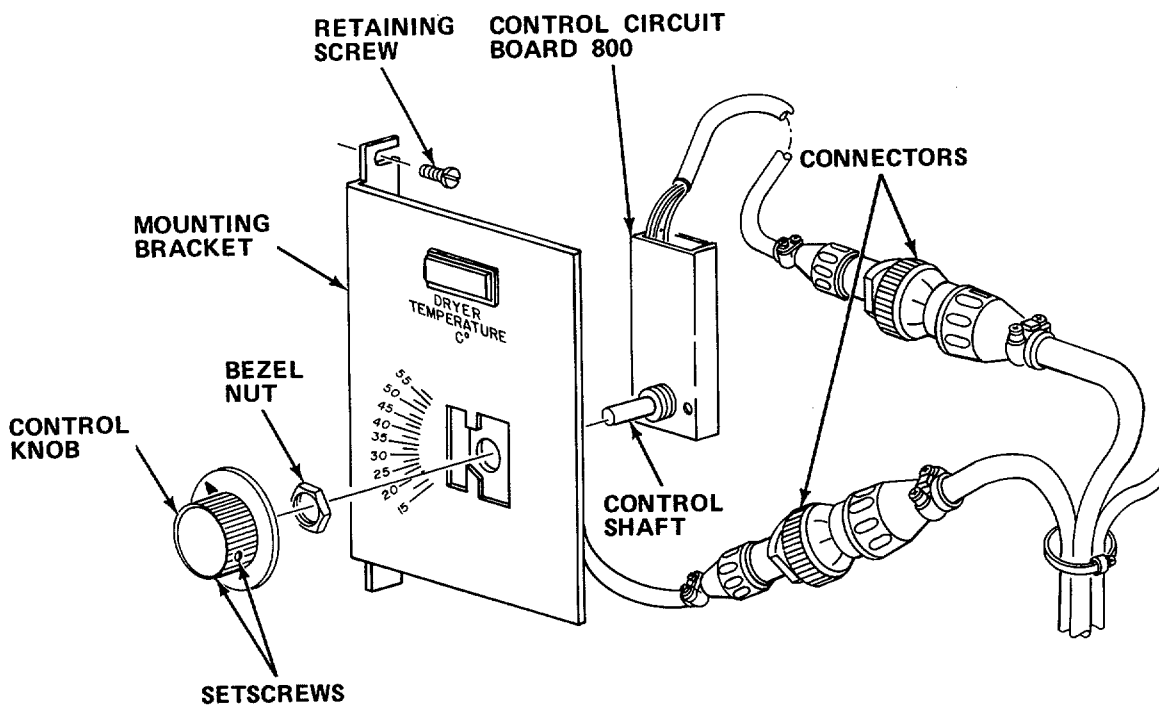
Tool Kit, Electronic Repair
 Cross Tip Screwdriver
 Flat Tip Screwdriver
 Socket Head Key Wrench Set
 Combination Wrench Set

SUPPLIES: Dryer Temperature Control Circuit Board 800

WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.
- b. Remove left and rear access panels.
- c. Loosen setscrews and remove DRYER TEMPERATURE control knob.
- d. Loosen retaining screws and remove DRYER TEMPERATURE mounting bracket.



- e. Disconnect two power cord connectors.
- f. Remove bezel nut retaining circuit board assembly to bracket.
- g. Remove control circuit board assembly.
- h. Install new control circuit board assembly in bracket and retain with bezel nut.
- i. Reinstall bracket and retain with screws.
- j. Plug in power cord connectors.

NOTE

Prior to reinstalling control knob, ensure that control shaft is turned fully to left (lowest position). Reinstall control knob so that indicator points to lowest position.

- k. Reinstall DRYER TEMPERATURE control knob and retain with setscrews.
- l. Reinstall left and rear access panels.
- m. Turn on processor circuit breaker.

5-16.10 Replace Top Cover Interlock Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

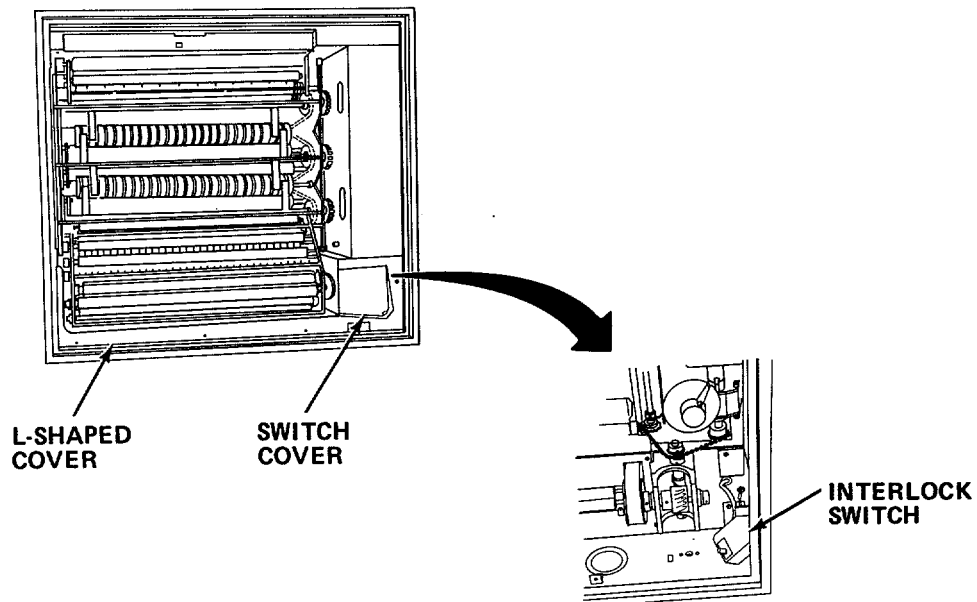
Tool Kit, Light Machine Repair
Cross Tip Screwdriver
Flat Tip Screwdriver

SUPPLIES: Top Cover Interlock Switch

WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.
- b. Remove top cover and left access panel.
- c. Remove squeegee crossover.
- d. Remove "L" shaped cover from rear panel.
- e. Remove switch cover.



- f. Remove screws retaining switch bracket to frame. Remove switch and bracket from frame.
- g. Tag and disconnect wiring from switch.
- h. Remove switch from bracket.
- i. Install new switch in bracket.
- j. Reconnect wiring to new switch.
- k. Install switch bracket to frame and retain with screws.
- l. Reinstall switch cover, "L" shaped cover.
- m. Reinstall squeegee crossover and top cover.
- n. Turn on processor circuit breaker.

5-16.11 Replace Detector Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair

Cross Tip Screwdriver

Flat Tip Screwdriver

Combination Wrench Set

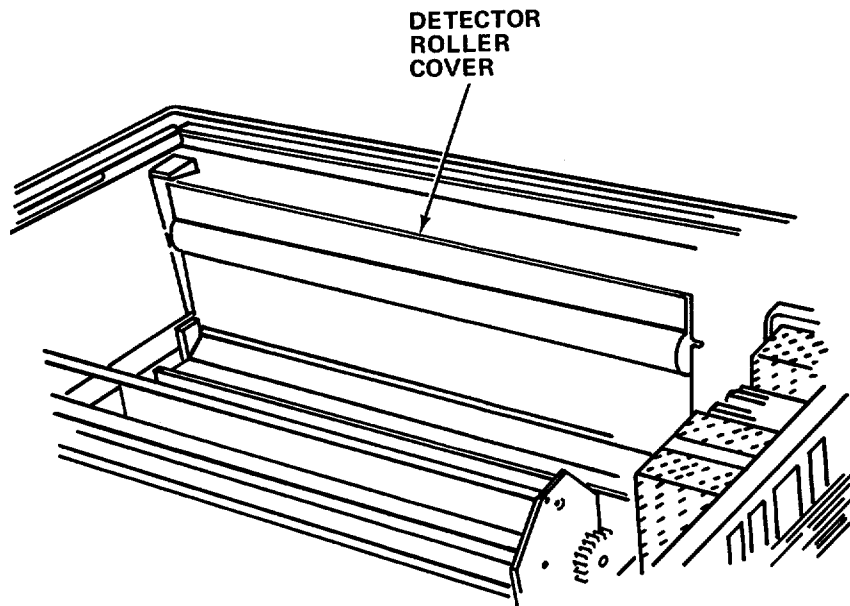
Thickness Gage Set

SUPPLIES: Detector Switch

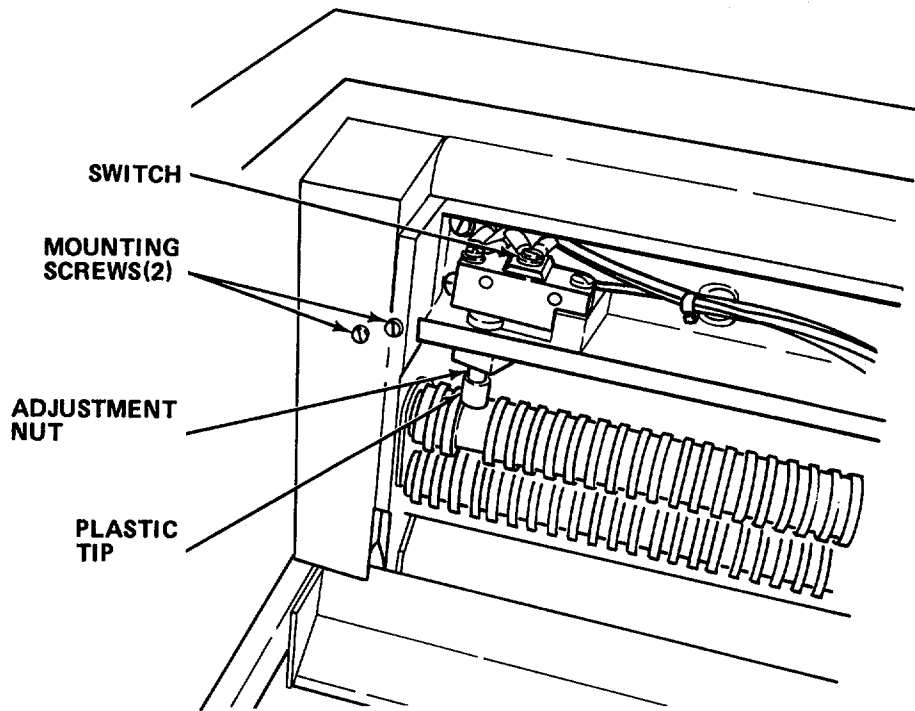
WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.
- b. Remove top cover.



- c. Remove entrance crossover.
- d. Loosen screws and remove detector roller cover. Remove plastic inner cover.



- e. Loosen screws at each end of switch mounting bracket. Remove screws from end of switch mounting bracket closest to switch to be replaced. Remove bracket and switches.
- f. Tag and disconnect wiring from switch.
- g. Unscrew adjusting nut and remove switch.
- h. Install new switch and retain with adjusting nut.
- i. Reconnect wiring.
- j. Reinstall switches and mounting bracket to detector roller assembly. Retain with screws.
- k. Adjust detector switches (refer to Table 5-3, Item 1).
- l. Reinstall plastic inner cover and detector roller cover.
- m. Reinstall entrance crossover.
- n. Reinstall top cover.
- o. Turn on processor circuit breaker.

5-16.12 Replace Control Unit Fuse.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

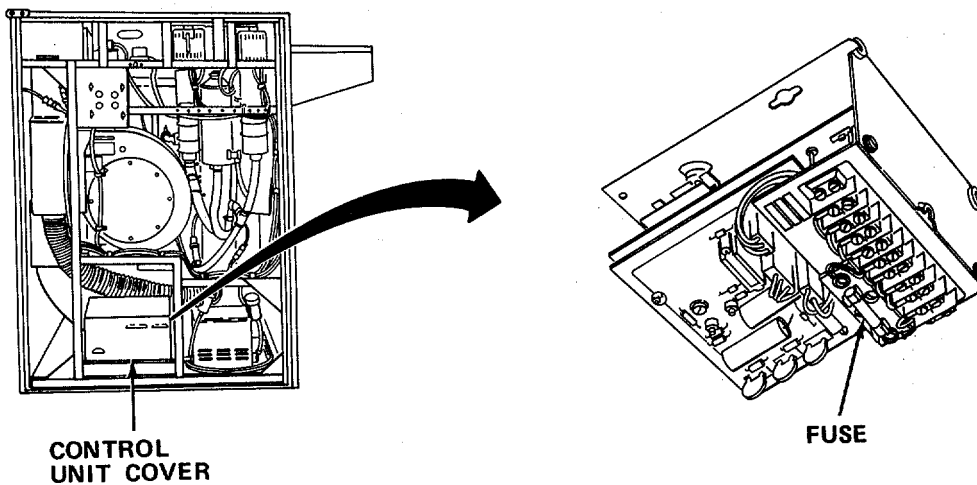
Tool Kit, Light Machine Repair
 Cross Tip Screwdriver
 Flat Tip Screwdriver
 Fuse Puller

SUPPLIES: Fuse, 5 amp

WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.
- b. Remove left access panel.



- c. Remove retaining screws and remove control unit cover.
- d. Remove control unit fuse.
- e. Install new control unit fuse.
- f. Reinstall control unit cover and retaining screws.
- g. Reinstall left access panel.
- h. Turn on processor circuit breaker.

5-16.13 Replace Drive Motor Generator Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

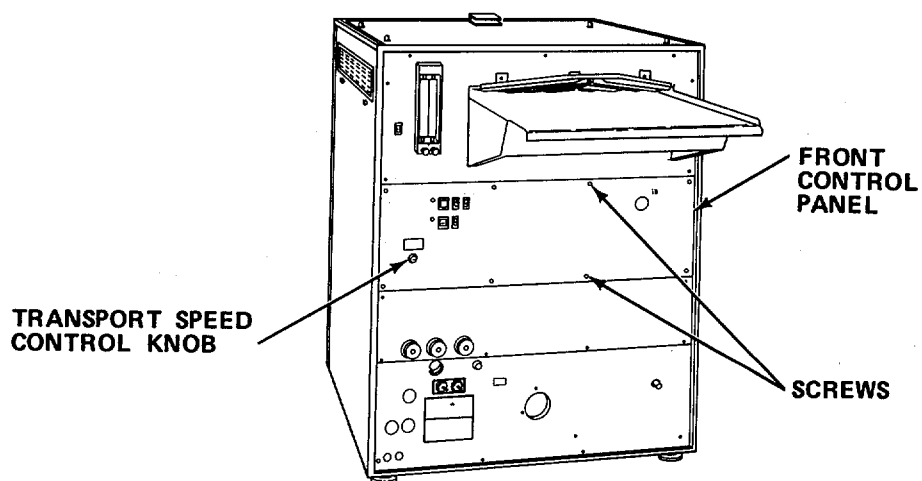
Tool Kit, Light Machine Repair
Cross Tip Screwdriver
Combination Wrench Set

SUPPLIES: Generator Assembly
Wire Ties

WARNING

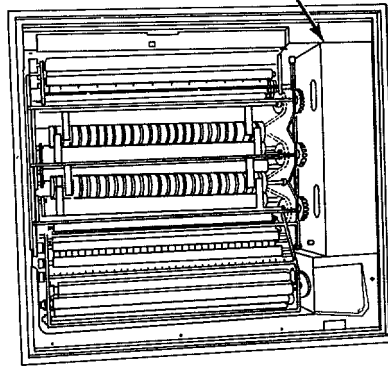
Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.
- b. Remove top cover and left access panel.

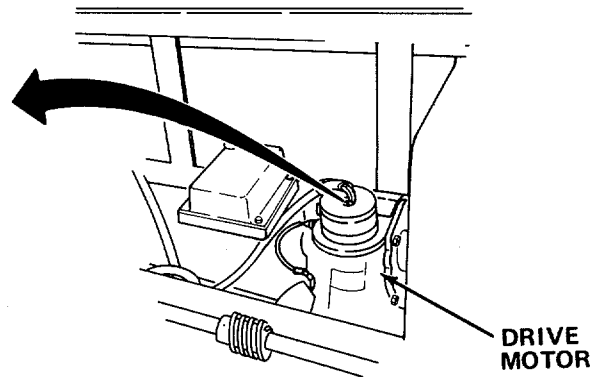
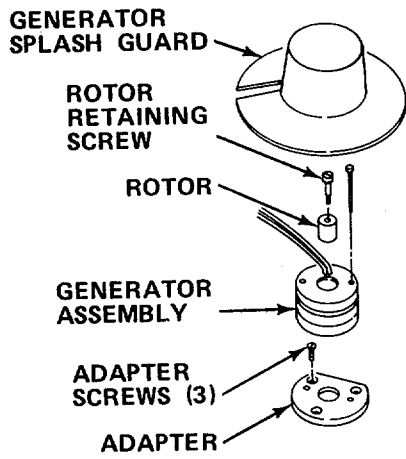


- c. Loosen setscrew and remove TRANSPORT SPEED control knob.
- d. Remove screws and front control panel.

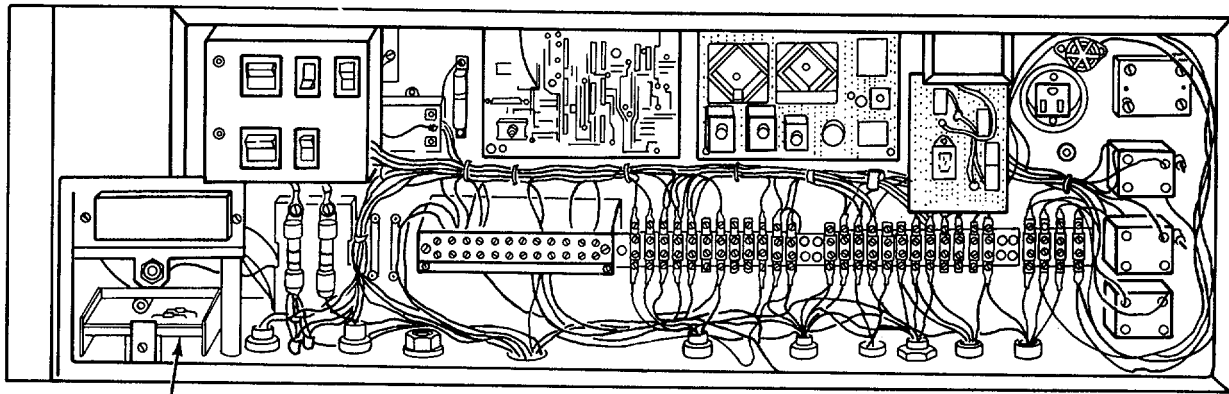
**FIXER AND DEVELOPER
PUMP SPLASH COVER**



- e. Remove fixer and developer pump splash cover.



- f. Remove generator splash guard.
- g. Remove retaining screws and generator assembly.



**CIRCUIT
BOARD 900**

- h. Remove wire ties from generator wiring. Disconnect two red generator wires from circuit board 900. Remove defective generator and wiring.
- i. Remove three screws and adapter.
- j. While holding shaft nut with combination wrench, remove retaining screw and rotor.
- k. Install new rotor onto motor, and retain with screw.
- l. Reinstall adapter and secure with screws.
- m. Install new generator assembly and retain with screws.
- n. Connect new generator wiring to circuit board 900. Apply wire ties.
- o. Reinstall generator splash guard.
- p. Reinstall front control panel and secure with screws.
- q. Reinstall TRANSPORT SPEED control knob. Tighten setscrew.
- r. Reinstall pump splash cover.
- s. Reinstall left access panel and top cover.
- t. Turn on processor circuit breaker.

5-16.14 Replace Drive Motor.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
 Cross Tip Screwdriver
 Flat Tip Screwdriver
 Combination Wrench Set
 Socket Head Key Wrench Set
 Diagonal Wire Cutters
 1/2 in. Socket Wrench Set

SUPPLIES: Drive Motor Assembly
 Wire Ties

PERSONNEL: Two persons are required to perform this procedure.

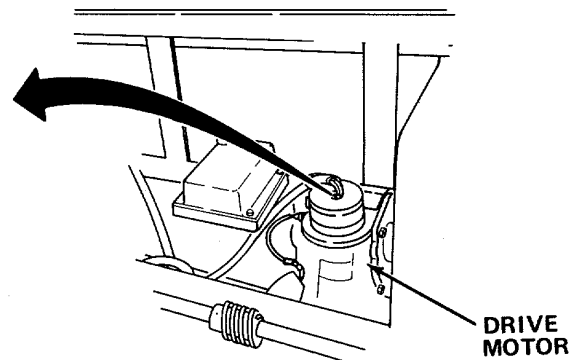
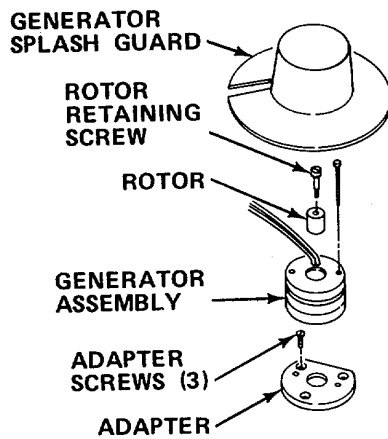
WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

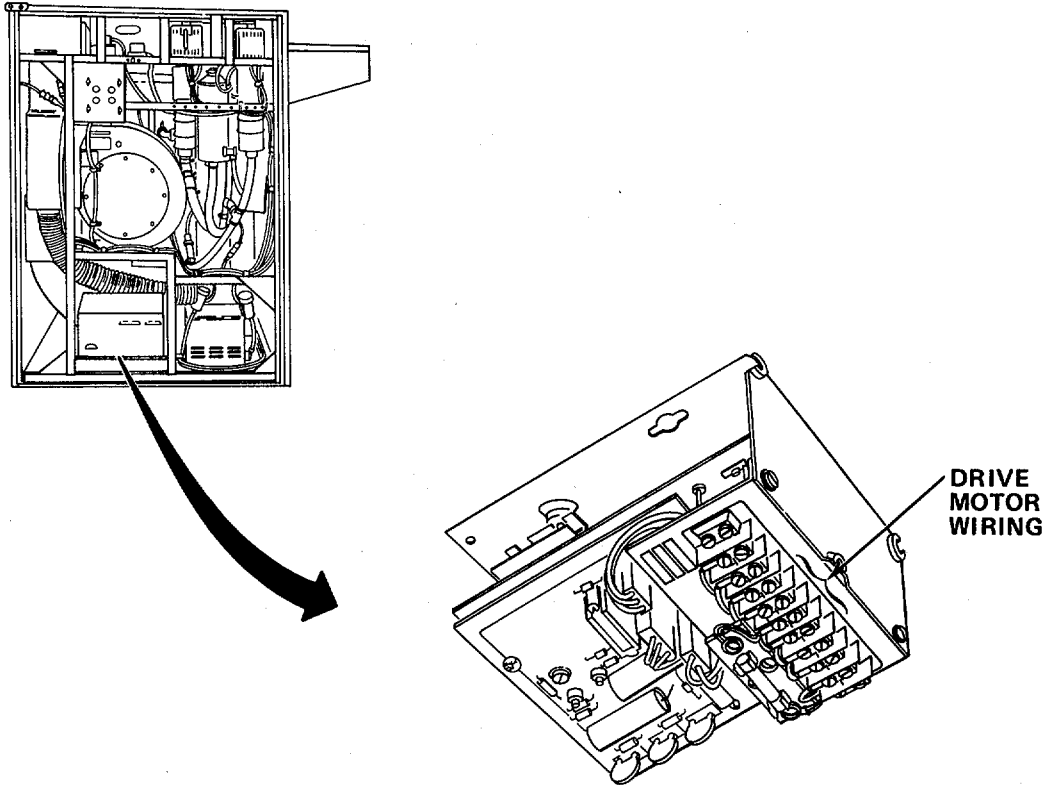
CAUTION

To prevent flooding and equipment damage, the fixer tank in the processor must be drained prior to beginning this procedure.

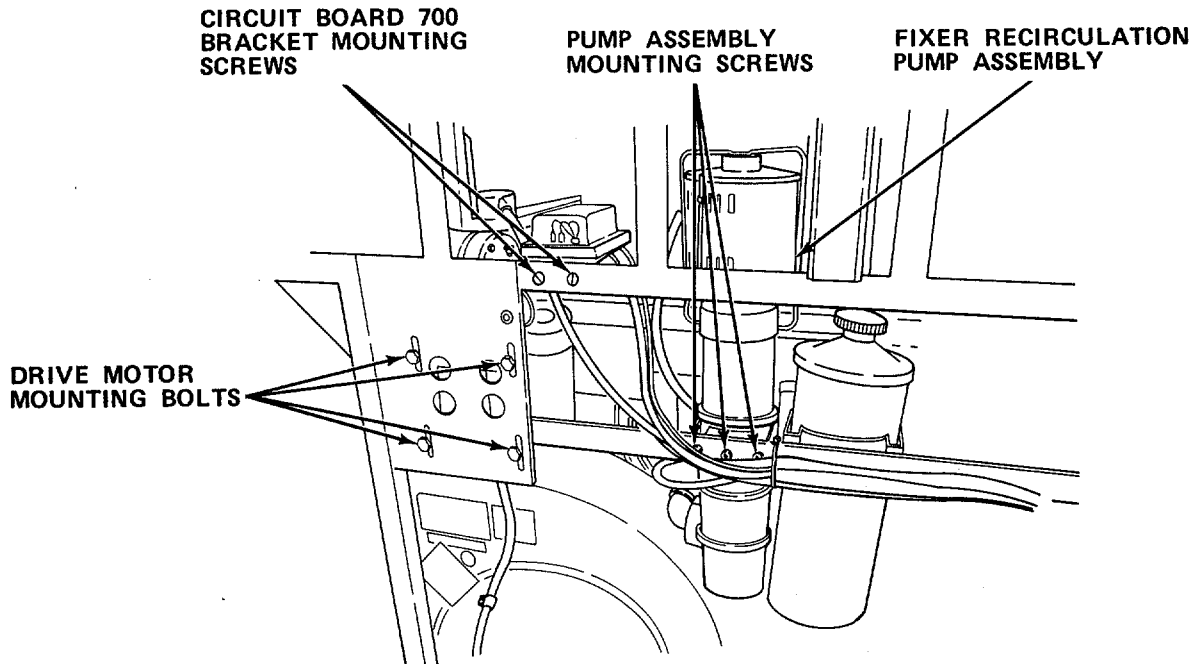
- a. Turn off processor circuit breaker.
- b. Remove top cover and left access panel.
- c. Remove fixer and developer pump splash cover.



- d. Remove generator splash guard.
- e. Remove retaining screws and generator assembly. Set generator assembly and wiring aside.
- f. Remove three screws and adapter.
- g. While holding shaft nut with combination wrench, remove retaining screw and rotor.
- h. Remove cable from retaining straps and cut wire ties from drive motor cable.
- i. Remove control unit cover.



- j. Tag and disconnect drive motor wires from control unit terminal block.
- k. Remove entire drive motor cable through strain relief bushing at rear of control unit.
- l. Remove ground wire from drive motor, and from processor frame.
- m. Remove chain guard. Loosen drive motor mounting bolts. Move drive motor upward, and remove drive chain.



- n. Remove developer temperature control circuit board 700, with bracket, by removal of two mounting screws from processor frame. Move circuit board and bracket aside.
- o. Remove three screws, bracket, and phenolic block from processor frame. This will release the fixer recirculation pump assembly from the frame.
- p. Loosen three fixer recirculation pump hose clamps nearest the pump assembly housing.
- q. Disconnect hoses at the recirculation pump. Remove pump assembly and set aside.
- r. Remove drive motor mounting bolts, nuts, and flat washers.
- s. Carefully slide drive motor toward front of processor, while turning motor on its side, and rotating motor mounting bracket upward.
- t. Remove defective drive motor and mounting bracket from film processor.
- u. Measure and record the distance from side of drive sprocket to end of drive motor shaft.
- v. Loosen setscrew and remove sprocket.
- w. Install sprocket to shaft of new drive motor assembly. Adjust sprocket to distance recorded in step u. Tighten setscrew.

- x. Remove four screws and motor mounting bracket from defective drive motor. Install bracket on new drive motor.
- y. Install new drive motor assembly in film processor, and secure with mounting bolts, flat washers, and nuts. Do not tighten nuts.
- z. Move drive motor upward and reinstall drive chain on sprocket. Reinstall chain guard. Tighten nuts on motor mounting bolts.
- aa. Reconnect ground wire.
- ab. Install rotor and retaining screw that were removed from defective drive motor.
- ac. Install adapter and secure with three screws.
- ad. Install generator assembly and secure with retaining screws.
- ae. Reinstall generator splash guard.
- af. Pull new drive motor cable through strain relief bushing at rear of control unit.
- ag. Connect new drive motor wiring to terminals on control unit terminal block. Reinstall control unit cover. Reinstall cable into retaining straps and install new wire ties to drive motor cable.
- ah. Reconnect hoses to fixer recirculation pump assembly. Tighten hose clamps.
- ai. Reattach recirculation pump assembly to processor frame. Secure with bracket, phenolic block, and three screws.
- aj. Reinstall developer temperature control circuit board 700. Secure bracket to frame with two screws.
- ak. Reinstall fixer and developer pump splash cover.
- al. Reinstall top cover and left access panel.
- am. Turn on processor circuit breaker.

5-16.15 Replace Dryer Heater.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

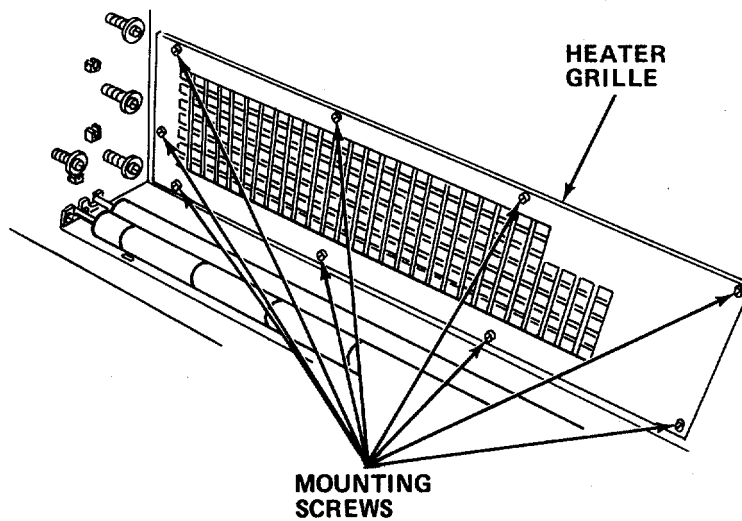
Tool Kit, Light Machine Repair
 Cross Tip Screwdriver
 Flat Tip Screwdriver
 Combination Wrench Set
 Socket Head Key Wrench Set

SUPPLIES: Dryer Heater
 Gloves

WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.
- b. Remove dryer air tubes and dryer rollers (Table 5-1, Item 13).



- c. Remove retaining screws and grille plate from dryer roller compartment.

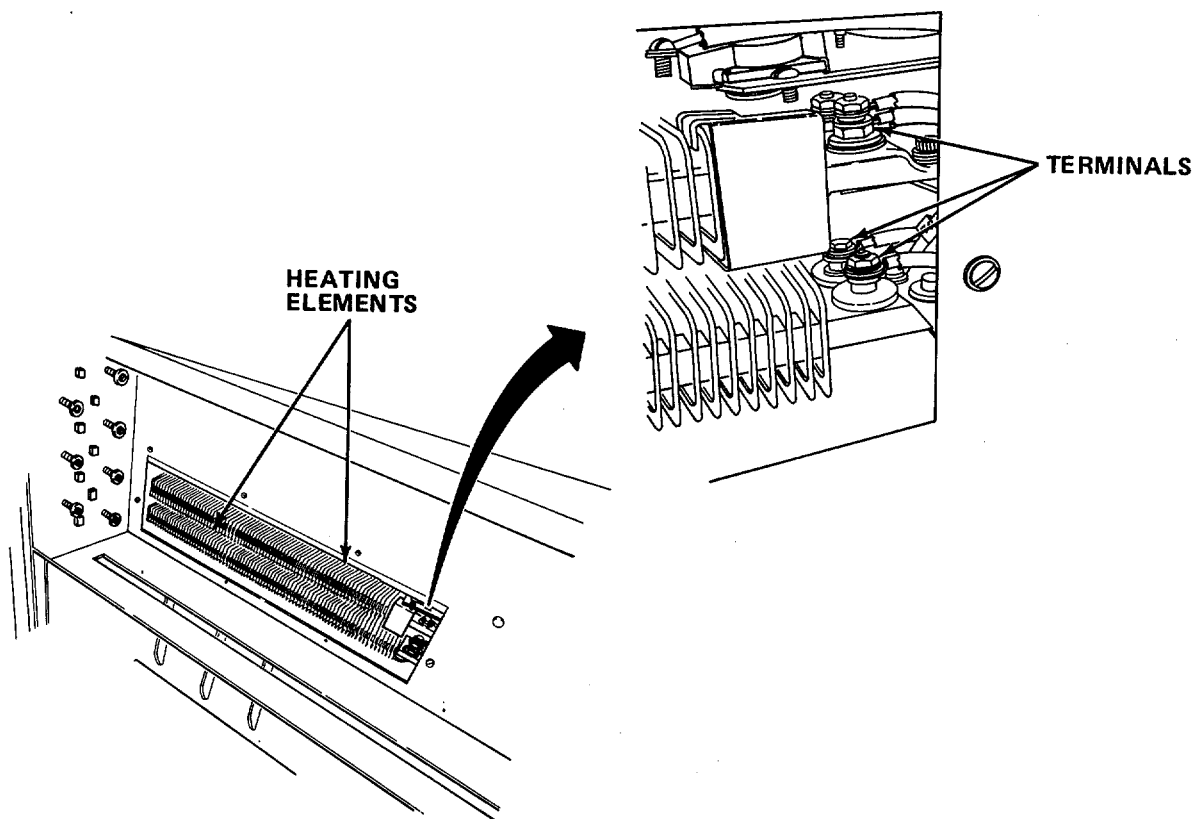
WARNING

To prevent serious burns, allow sufficient time for heating element to cool down.

NOTE

Grasp heating element and support element while removing retaining screws.

- d. Remove two screws from heater mounting brackets on each end of heating element. Gently lower element into shroud compartment.



- e. Tag wiring and remove nuts and wiring from terminals on end of heater assembly.
- f. Remove socket head screws retaining heater assembly to brackets. Remove heater assembly.
- g. Install new heater assembly to brackets. Retain with socket head screws.
- h. Reinstall wiring to terminals and retain with nuts.
- i. Reinstall brackets and heating element with screws.
- j. Reinstall grille plate and retain with screws.
- k. Reinstall dryer air tubes and dryer rollers (Table 5-1, Item 13).
- l. Turn on processor circuit breaker.

5-16.16 Replace Dryer Heater Overtemperature Thermostat.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

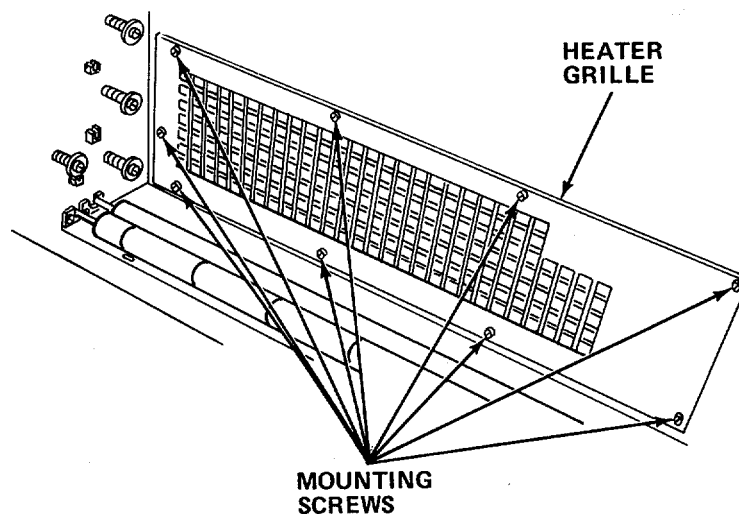
Tool Kit, Light Machine Repair
 Cross Tip Screwdriver
 Flat tip Screwdriver
 Socket Head Key Wrench Set

SUPPLIES: Dryer Heater Overtemperature Thermostat
 Gloves

WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.
- b. Remove dryer air tubes and dryer rollers (Table 5-1, Item 13).



- c. Remove retaining screws and grille from dryer roller compartment.

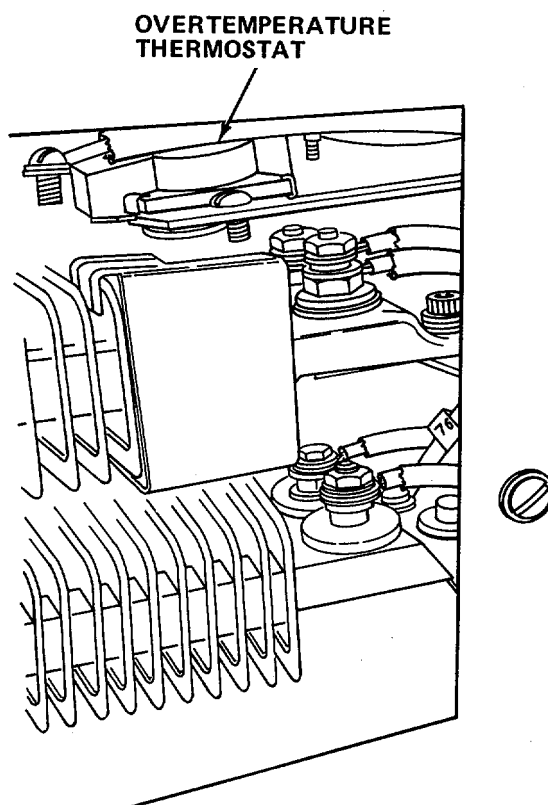
WARNING

To prevent burns, allow sufficient time for heating element to cool down.

NOTE

Grasp heating element and support element while removing retaining screws.

- d. Remove two screws from heater mounting brackets on each end of heating element. Gently lower element into shroud compartment.



- e. Label and disconnect wiring from thermostat assembly.
- f. Remove screws retaining thermostat assembly to bracket. Remove thermostat assembly.
- g. Install new thermostat assembly to bracket and retain with screws.
- h. Reconnect wiring to thermostat.
- i. Reinstall heating element brackets and retain with screws.
- j. Reinstall grille and retain with screws.
- k. Reinstall dryer air tubes and dryer rollers (Table 5-1, Item 13).
- l. Turn on processor circuit breaker.

5-16.17 Replace Heater/Recirculating Pump/Sump Pump Switch(es).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

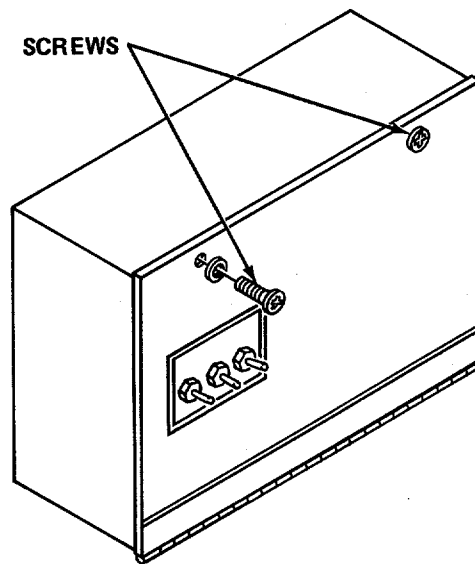
Tool Kit, Light Machine Repair
Cross Tip Screwdriver
Flat Tip Screwdriver
Combination Wrench Set

SUPPLIES: Switch(es)

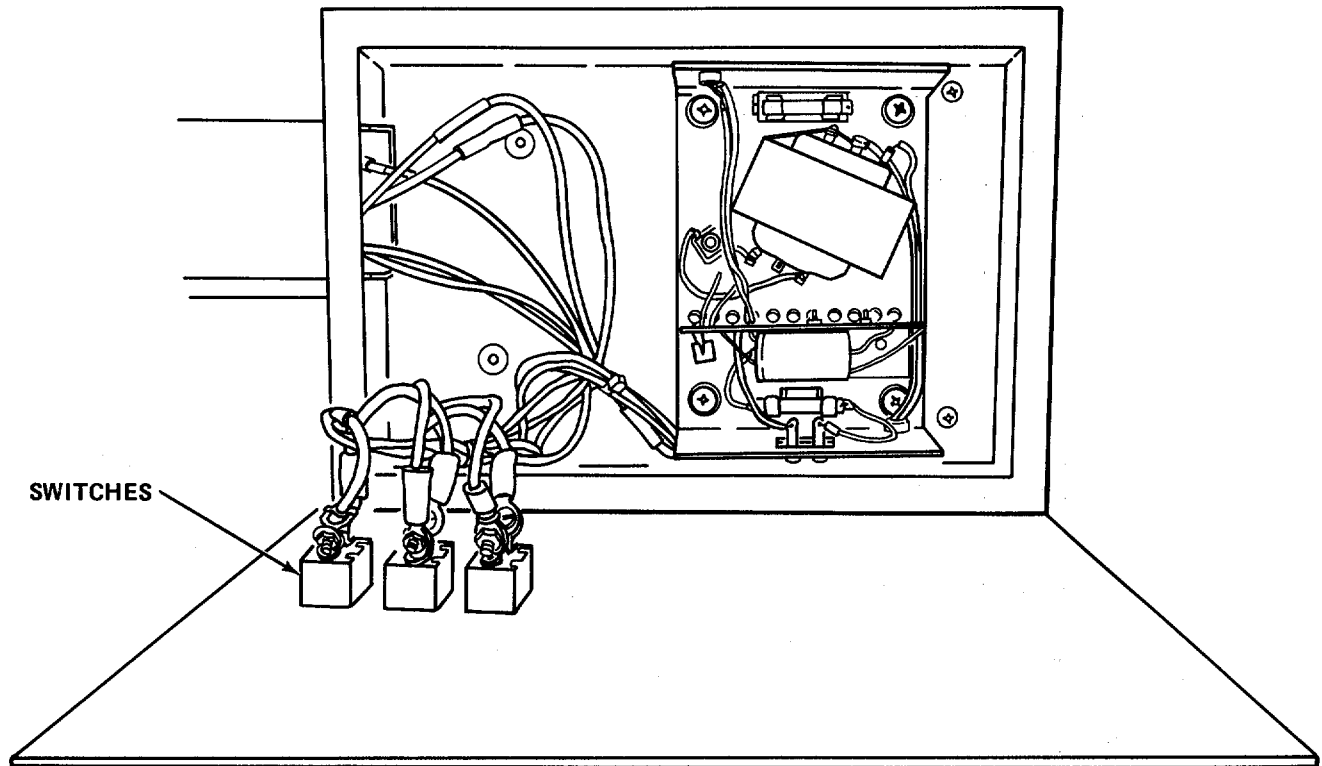
WARNING

Death or serious injury may occur from electrical shock if recirculating water control circuit breaker is not turned off before servicing switches.

- a. Turn off CB7 on van's circuit breaker panel.
- b. Unstrap and move chiller away from wall.



- c. Remove screws and open switch panel.



- d. Tag and disconnect wiring from switch.
- e. Remove bezel nut, washer, and defective switch from panel.
- f. Install new switch into panel and retain with washer and bezel nut.
- g. Reconnect electrical wiring to new switch.
- h. Close switch panel and retain with screws.
- i. Move chiller back to proper position and reinstall straps.
- j. Turn on CB7 on van's circuit breaker panel.

5-16.18 Replace Hoses.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
Flat Tip ScrewdriverSUPPLIES: Clamp
Plastic Hose
Plastic Pail (Item 35, Appendix E)

- a. Be sure processor tanks are drained.

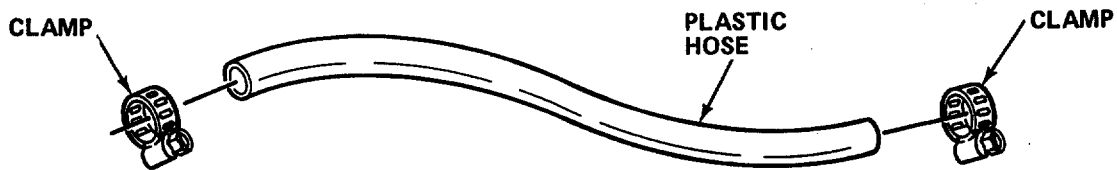
WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- b. Turn off processor circuit breaker.
- c. Remove access panels.

NOTE

Be sure incoming water supply is shut off by turning recirculation tank WATER SUPPLY valve to off position.



- d. Turn recycling valve off.
- e. Place plastic pail under hose to be removed, to catch spillage.
- f. Remove clamps and defective hose.
- g. Install new hose and clamps.
- h. Replace access panels.
- i. Turn on processor circuit breaker.

5-16.19 Replace Blower Motor.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

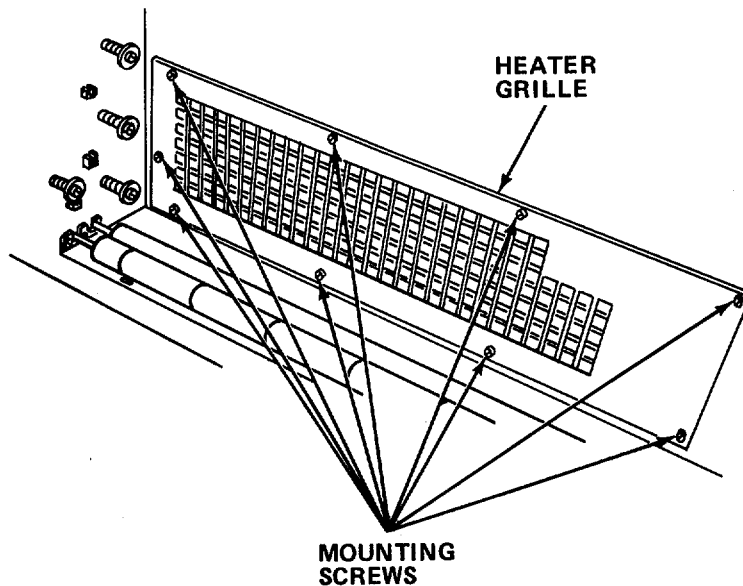
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Socket Head Key Wrench Set
Combination Wrench Set

SUPPLIES: Blower Motor
Wire Ties
Rubber Spray Adhesive (Item 3, Appendix E)

WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before beginning replacement of blower motor.

- a. Turn off processor circuit breaker.
- b. Remove right and left access panels.
- c. Remove rear panel.
- d. Remove air tubes and dryer rollers (Table 5-1, Item 13).



- e. Remove grille.

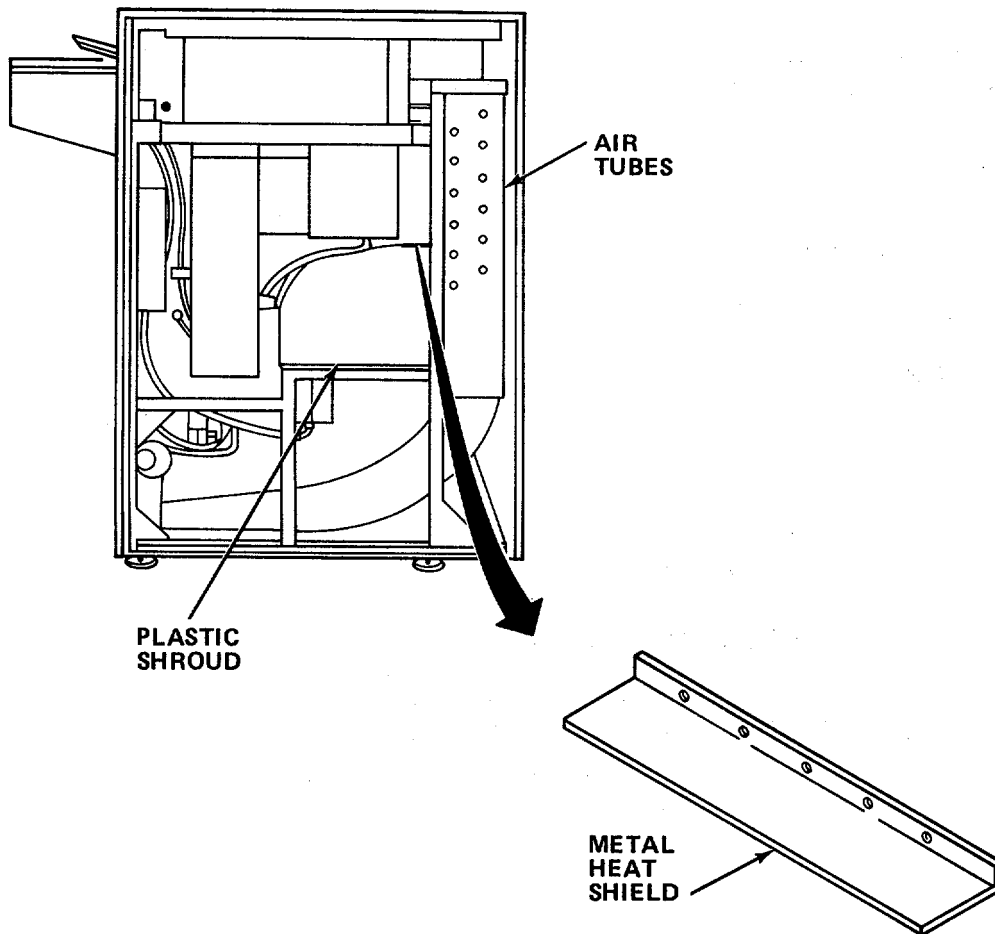
NOTE

Upper plastic shroud mounting screws are removed from dryer roller compartment.

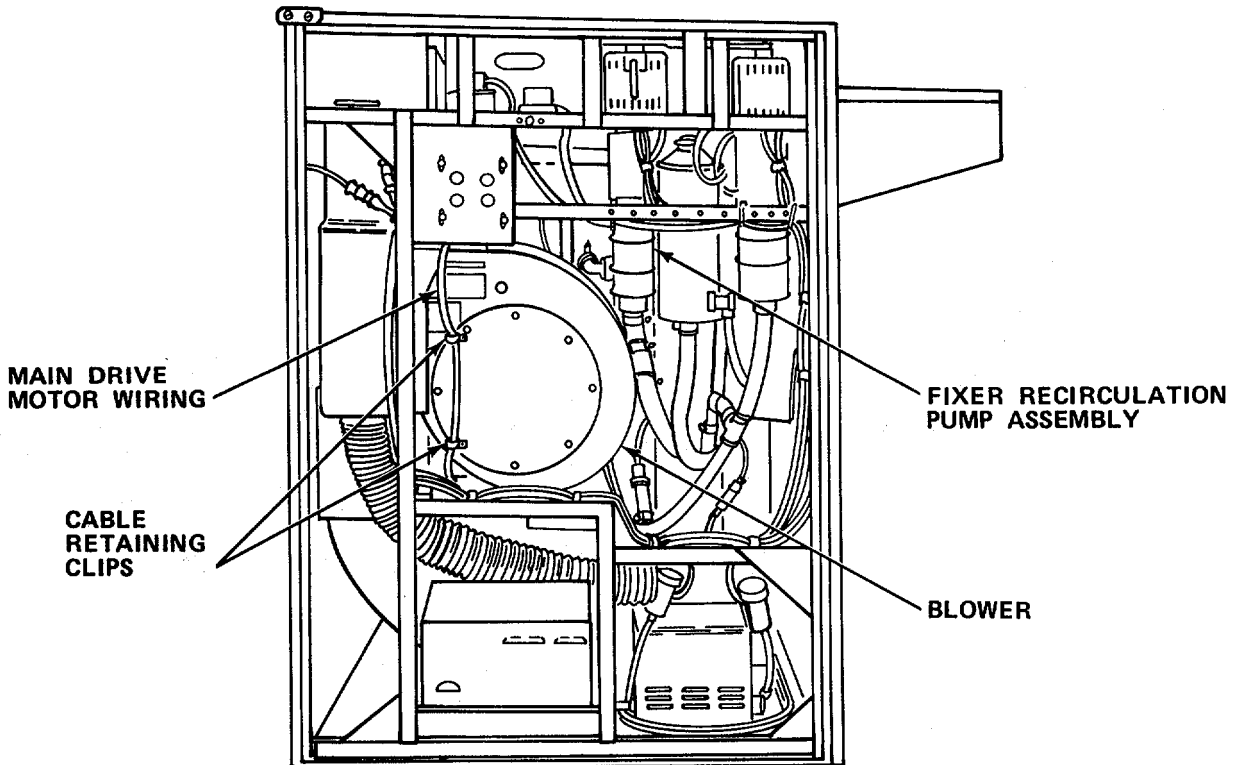
- f. Remove five socket head capscrews and flat washers.

CAUTION

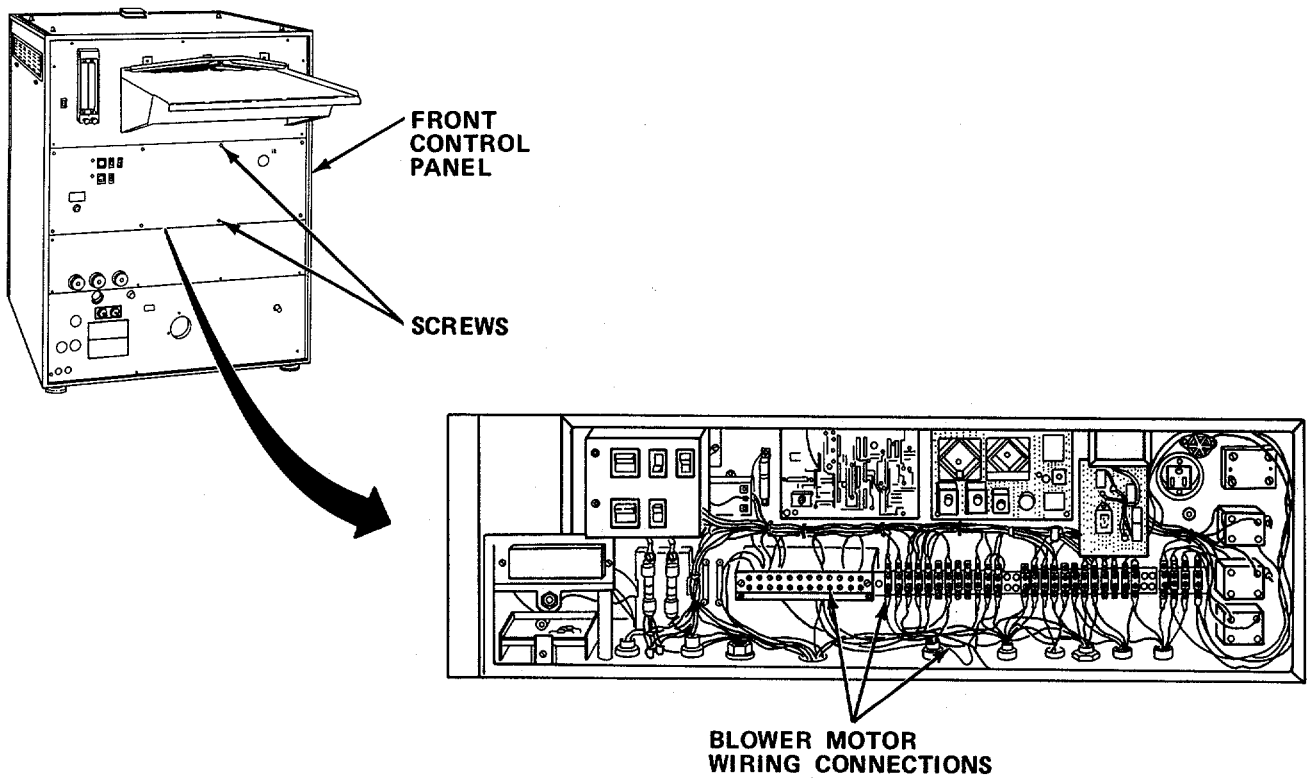
To prevent improper reinstallation and equipment damage, note position of metal heat shield prior to removal.



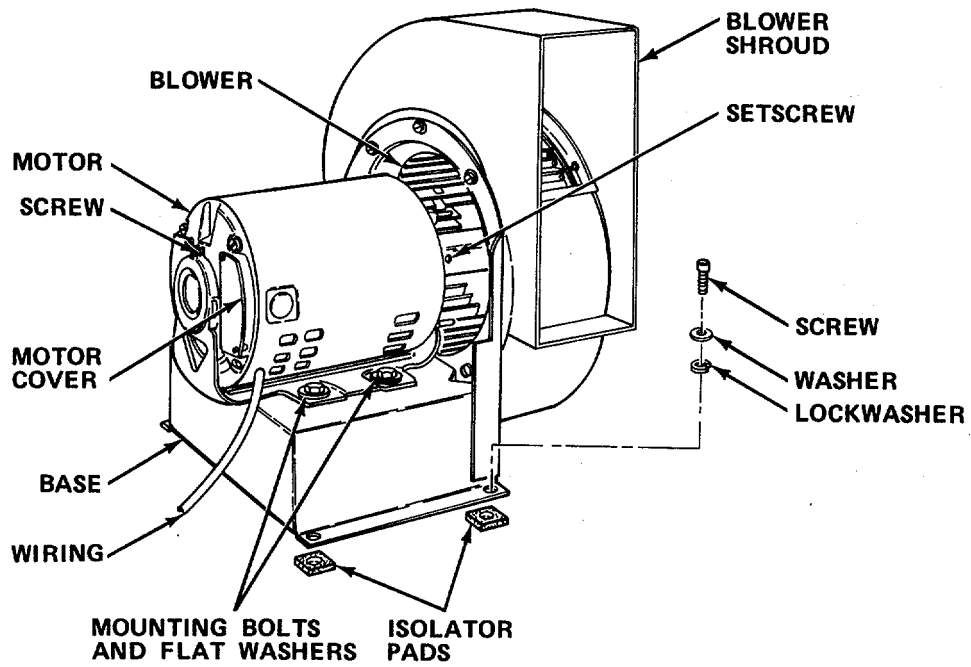
- g. Remove five screws and metal heat shield. Partially remove the plastic shroud from right side of processor.



- h. Cut wire ties. Remove cable from retaining clips and move cable out of way of blower assembly.
- i. Remove mounting bolts, lockwashers, and flat washers securing blower motor base to processor frame.
- j. Remove two screws and bracket securing fixer recirculation pump assembly to processor frame. Move pump assembly aside.
- k. Remove drive motor power cable from retaining clips on side of blower shroud.
- l. Slowly withdraw blower assembly from left side of processor. Remove isolator pads.
- m. Remove TRANSPORT SPEED control knob.
- n. Remove screws and front control panel.



- o. Remove blower motor wiring connections on terminal blocks. Disconnect ground wire, and remove cable from processor.



- p. Remove setscrews connecting motor shaft to blower.
- q. Remove motor mounting bolts, flat washers, lockwashers and nuts; remove defective blower motor from base.
- r. Aline shaft with blower. Install new blower motor on base, and secure with bolts, flat washers, lockwashers and nuts.
- s. Reinstall setscrews in motor shaft.

NOTE

- Rubber spray adhesive on isolator pads will assist in reinstallation.
- Allow rubber spray adhesive to dry before proceeding with reinstallation.

- t. Reinstall isolator pads into position under motor base.
- u. Reinstall blower assembly into processor. Secure with mounting bolts, lockwashers and flat washers. Tighten bolts securely.
- v. Lead blower motor cable through frame to front of processor. Connect new wiring to terminal blocks. Connect ground wire.
- w. Install cable into retaining clips on side of blower shroud. Secure cable to frame with new wire ties.
- x. Reinstall front control panel and secure with screws.
- y. Reinstall TRANSPORT SPEED control knob and tighten setscrew.
- z. Reinstall fixer recirculation pump assembly to processor frame and secure with bracket and two screws.
- aa. Reinstall metal heat shield and plastic shroud. Secure with screws, socket head capscrews, and flat washers.
- ab. Reinstall grille.
- ac. Reinstall air tubes and dryer rollers.
- ad. Reinstall right and left side access panels.
- ae. Reinstall rear panel.
- af. Turn on processor circuit breaker.

5-16.20 Replace Recirculation Tank Heating Element.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair

Flat Tip Screwdriver

Cross Tip Screwdriver

Nut Driver Set

14 in. Pipe Wrench

SUPPLIES: Heating Element

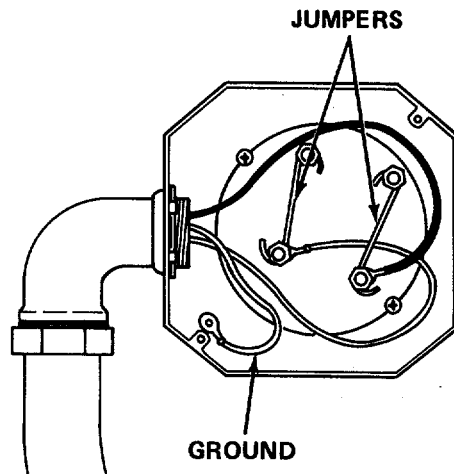
Thread Sealer (Item 64, Appendix E)

Plastic Utility Pail (Item 35, Appendix E)

WARNING

Death or serious injury may occur from electrical shock unless recirculation water control circuit breaker is turned off before servicing.

- a. Turn off recirculation water control circuit breaker CB7.
- b. Drain water from recirculation tank.
- c. Remove cover from heating element housing.

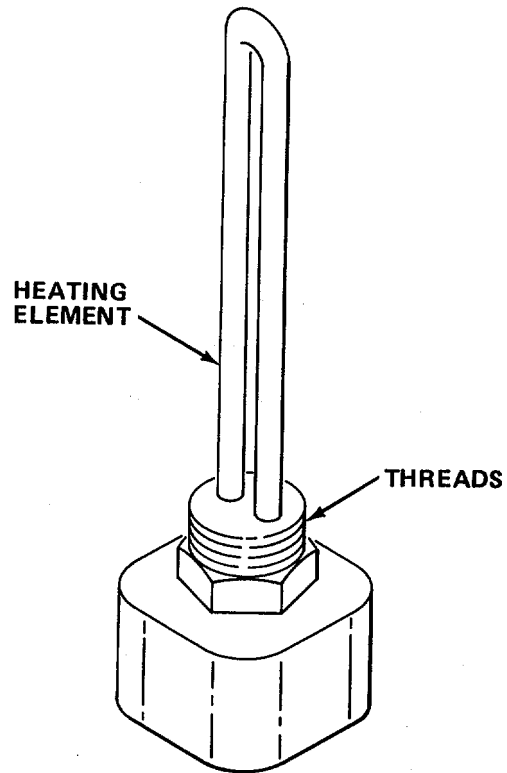


- d. Tag and disconnect heating element wiring.
- e. Remove retaining screws and washers and electrical box from heating element.

NOTE

Some water may be present in tank. Use pail to collect water.

- f. Unscrew defective heating element and remove.



- g. Coat threads of new element with sealer and install.
h. Reinstall electrical box and wires to element housing with screws and washers.
i. Reconnect wiring and reinstall cover.

CAUTION

Do not turn on circuit breaker or heater switch until tank is filled with water or heating element will be damaged.

- j. Fill tank with water.
k. Turn on circuit breaker CB7.

5-16.21 Replace Recirculation Tank Thermostat.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

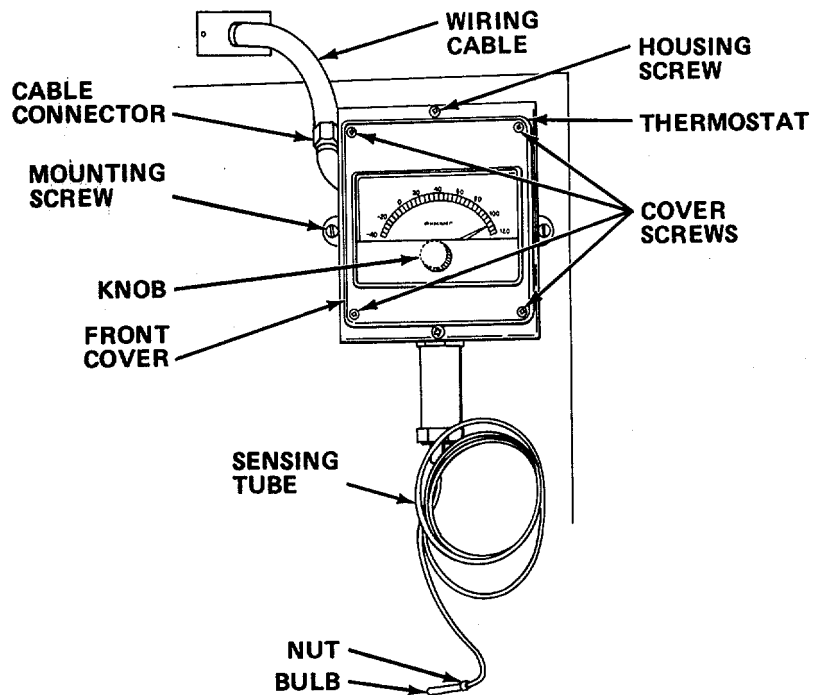
Tool Kit, Light Machine Repair
 Cross Tip Screwdriver
 Socket Head Key Wrench Set
 12 in. Adjustable Wrench

SUPPLIES: Thermostat
 Wire Nuts
 Teflon Tape (Item 66, Appendix E)

WARNING

Death or serious injury may occur from electrical shock unless recirculation water control circuit breaker is turned off before servicing.

- a. Turn off recirculation water control circuit breaker CB7.



- b. Loosen hex head setscrew on knob and remove knob.
- c. Remove four screws and front thermostat cover.
- d. Tag and disconnect wiring from thermostat.
- e. Remove nut and cable connector from box.
- f. Drain water from tank.

CAUTION

Use care when removing bulb to avoid damaging sensing tube.

- g. Loosen nut and remove sensing bulb.
- h. Remove two mounting screws and one housing screw. Remove thermostat.
- i. Install new thermostat with mounting screws and housing screw.
- j. Apply new teflon tape to threads and reinstall thermostat sensing bulb connector in tank. Tighten retaining nut.
- k. Reconnect cable and cable connector to box and secure with nut.
- l. Reconnect thermostat wiring.
- m. Reinstall front cover and secure with screws.

CAUTION

Do not turn on circuit breaker or heater switch until tank is refilled or heating element will be damaged.

- n. Fill tank with water.
- o. Turn on circuit breaker CB7.

5-16.22 Replace Recirculation Pump.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair

Cross Tip Screwdriver

Flat Tip Screwdriver

Combination Wrench Set

Diagonal Wire Cutters

SUPPLIES: Recirculation Pump Assembly

Wire Ties

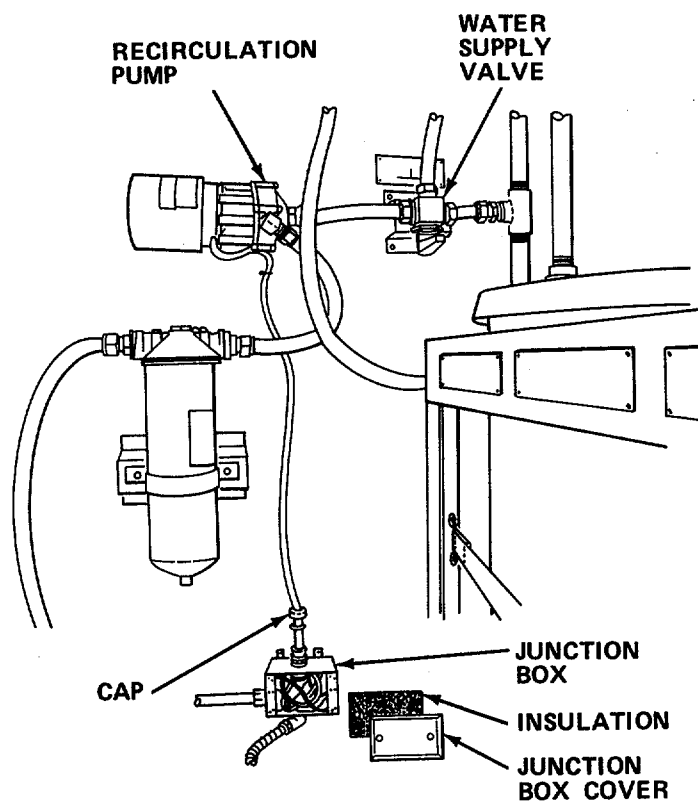
Plastic Pail (Item 35, Appendix E)

Wire Nuts

WARNING

Death or serious injury may occur from electrical shock unless circuit breaker is turned off before beginning pump replacement.

- a. Turn off CB7 on van's circuit breaker panel.



- b. Close WATER SUPPLY valve.

- c. Loosen hose connectors at pump; drain hoses into pail. Tag and remove hoses and connectors.
- d. Remove two screws, cover, and insulation from electrical junction box.
- e. Tag and cut recirculation pump wires inside junction box.
- f. Unscrew cap from top of junction box and remove pump wiring. Remove wire ties.
- g. Remove retaining bolts, lockwashers, and defective pump from wall.
- h. Install new pump on wall and secure with bolts and lockwashers.

CAUTION

To prevent equipment damage, ensure that hoses are reconnected in proper positions.

- i. Reconnect hoses and tighten connectors securely.
- j. Install new wire ties on new pump cable, and insert cable into junction box. Replace cap.
- k. Connect new pump wiring with wire nuts.
- l. Reinstall cover and insulation on junction box and secure with screws.
- m. Open WATER SUPPLY valve.
- n. Turn on CB7 on van's circuit breaker panel.

5-16.23 Replace Sump Pump.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

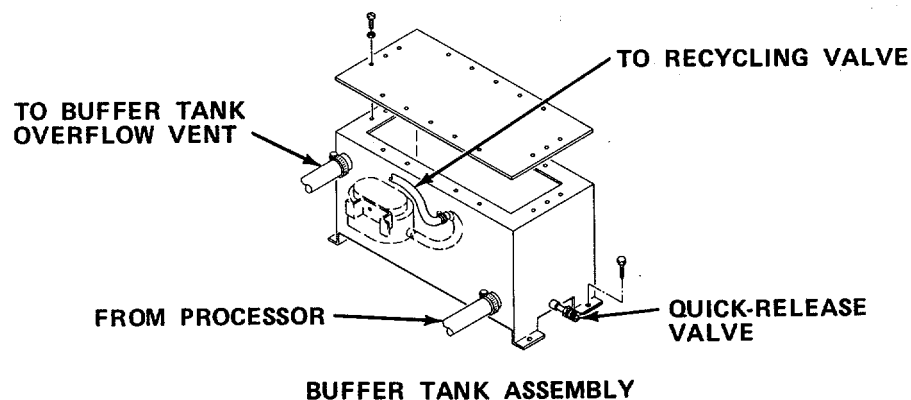
Tool Kit, Light Machine Repair
 Cross Tip Screwdriver
 Flat Tip Screwdriver
 1/2 in. Socket, 1/2 in. Drive
 1/2 in. Drive Ratchet
 Combination Wrench Set
 Diagonal Wire Cutters

SUPPLIES: Sump Pump
 Plastic Pail (Item 35, Appendix E)
 Electrical Tape (Item 59, Appendix E)

WARNING

Death or serious injury may occur from electrical shock unless circuit breaker is turned off before beginning replacement of sump pump.

- a. Turn off CB7 on van's circuit breaker panel.

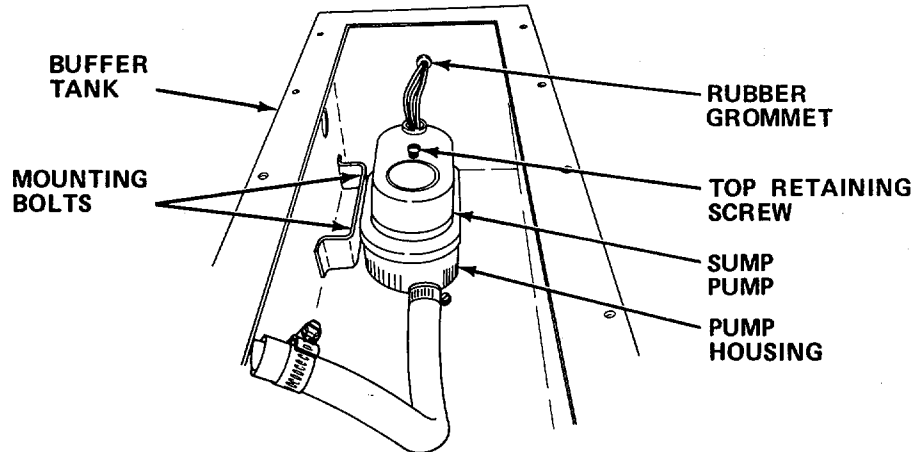


- b. Remove four lag bolts securing buffer tank to floor.
- c. Loosen hose clamps and remove drain hose and RECYCLING VALVE hose at the tank.

CAUTION

Exercise care when moving buffer tank to ensure that quick-release valve is not damaged.

- d. Carefully move buffer tank from beneath replenishment tank stand.
- e. Turn tank on side and drain contents into plastic pail.
- f. Remove sixteen screws, lockwashers, flat washers, and buffer tank cover.



NOTE

The striped pump wire is unconnected.

- g. Cut pump wiring as close as possible to defective pump.
- h. Remove conduit nut from bracket at end of buffer tank. Remove conduit and pull pump wiring through rubber grommet.
- i. Remove top retaining screw and sump pump from pump housing.
- j. Remove two mounting bolts, lockwashers, and nuts securing pump housing to bracket inside buffer tank.
- k. Loosen hose clamp at pump housing. Remove hose.
- l. Remove defective pump and housing from buffer tank.
- m. Remove top retaining screw and separate pump from housing.
- n. Install new housing into buffer tank and secure to bracket with two mounting bolts, lockwashers and nuts.
- o. Install new sump pump onto housing and secure with top retaining screw.
- p. Thread new wiring through rubber grommet.

NOTE

Striped pump wire is to remain unconnected.

- q. Splice new wiring, color to color, to wiring extending from conduit. Tape splices securely, and feed excess wire into conduit.
- r. Reinstall conduit into buffer tank bracket and secure with conduit nut.
- s. Reinstall cover on buffer tank and secure with screws, lockwashers, and flat washers.

CAUTION

Exercise care when reinstalling buffer tank to ensure that quick-release valve is not damaged.

- t. Carefully reinstall buffer tank beneath replenisher tank stand. Secure to floor with lag bolts.
- u. Reinstall drain hose and RECYCLING VALVE hose on buffer tank. Tighten hose clamps.
- v. Turn on CB7 on van's circuit breaker panel.

5-16.24 Replace 12 Volt Power Supply.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

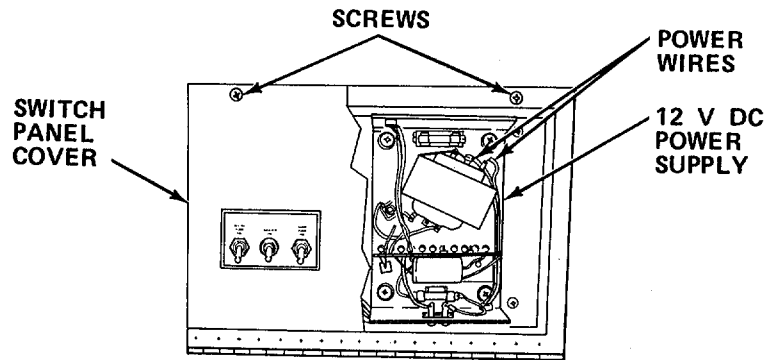
Tool Kit, Electronic Repair
 Flat Tip Screwdriver
 Cross Tip Screwdriver
 Soldering Iron
 Solder

SUPPLIES: 12 Volt Power Supply

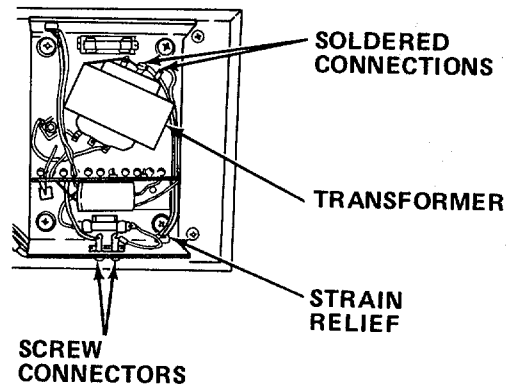
WARNING

Death or serious injury may occur from electrical shock unless circuit breaker is turned off before beginning replacement of power supply.

- a. Turn off circuit breaker CB7 on van's circuit breaker panel.
- b. Unstrap and move chiller away from wall.



- c. Remove two screws and lower switch panel cover.
- d. Remove four mounting screws, flat washers, and lockwashers. Carefully remove power supply from switch panel with wiring attached.



- e. Tag and desolder two wires at transformer terminals. Remove wires and strain relief bushing from chassis.
- f. Loosen two screws on bottom of power supply chassis; tag and remove two wires. Remove defective power supply.
- g. Connect wires at bottom of new power supply chassis, and secure with two screws.
- h. Install two wires through strain relief and aperture in chassis. Solder to transformer terminals.
- i. Firmly seat strain relief in power supply chassis.
- j. Install new 12 volt power supply in switch panel and secure with four screws, flat washers and lockwashers.
- k. Close switch panel cover and secure with two screws.
- l. Replace chiller on chiller base and secure with straps.
- m. Turn on CB7 on van's circuit breaker panel.

5-16.25 Replace Chiller.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
Flat Tip Screwdriver

SUPPLIES: Chiller

Hose Clamps

Plugs (3/8 in.)

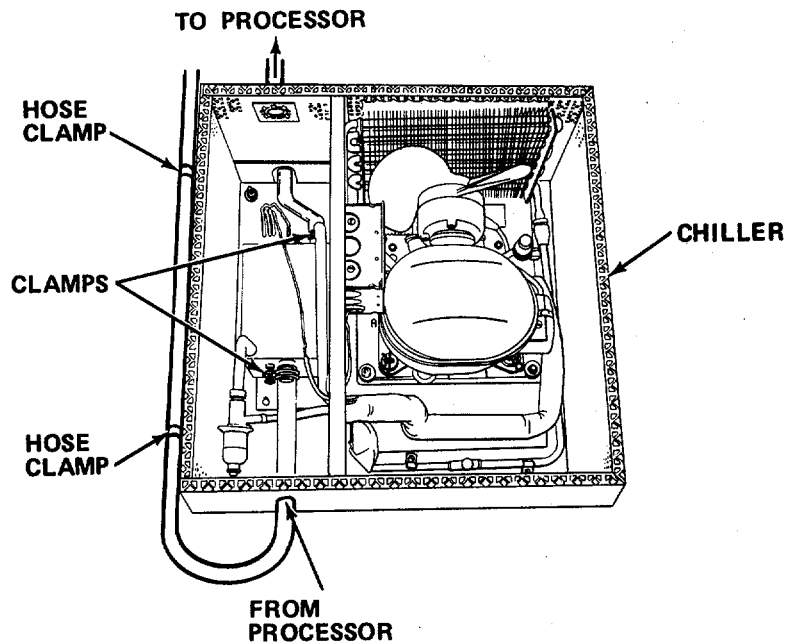
Safety Glasses

WARNING

* Eye protection must be worn when performing this procedure or serious injury may occur. If chemicals get in your eyes, wash them with plenty of water and get medical help immediately.

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

- a. Unplug chiller power cord.
- b. Remove retaining straps and top cover.



- c. Loosen two clamps and one hose support clamp. Remove processor hoses and plug hoses to prevent developer loss.
- d. Remove chiller.
- e. Install new chiller.
- f. Remove plugs and reinstall two processor hoses. Secure with hose clamps and support clamp.
- g. Reinstall top cover and retaining straps.
- h. Plug in power cord.

5-16.26 Replace Relays.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

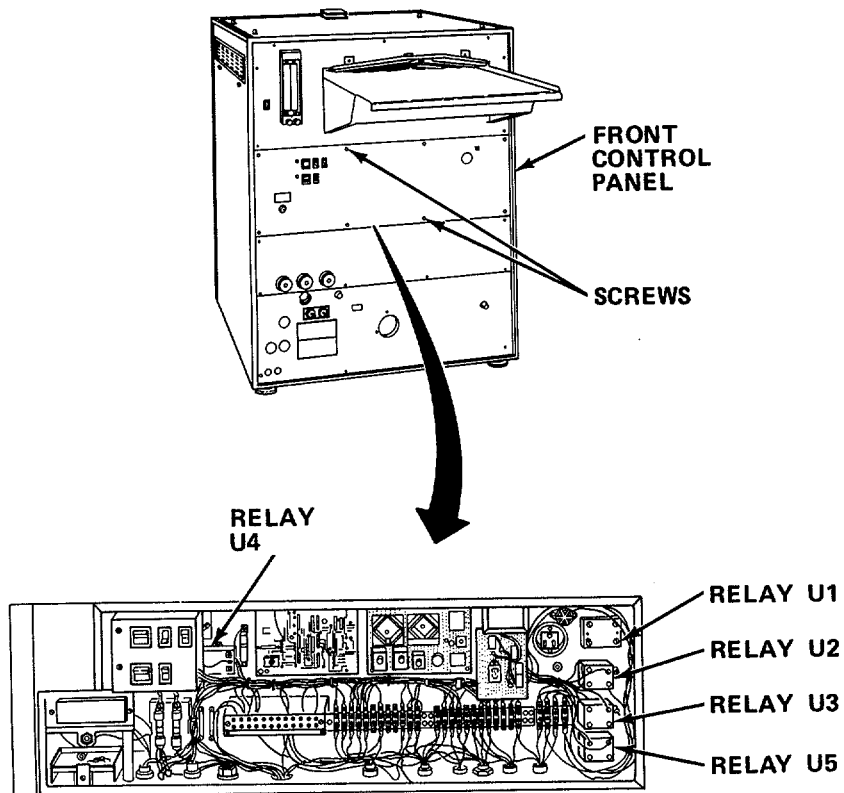
Tool Kit, Electronic Repair
 Flat Tip Screwdriver
 Socket Head Key Wrench Set

SUPPLIES: Relay U1
 Relay U2
 Relay U3
 Relay U5
 Motor Start Relay U4

WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.



- b. Loosen setscrew and remove TRANSPORT SPEED control knob.
- c. Remove screws and front control panel.
- d. Tag and disconnect wiring from relay.
- e. Remove mounting screws and relay.
- f. Replace relay and secure with mounting screws.
- g. Reinstall wiring to relay.
- h. Reinstall electronics cover and retain with screws.
- i. Reinstall TRANSPORT SPEED control knob. Tighten setscrew securely.
- j. Turn on processor circuit breaker.

5-16.27 Replace Developer Heater.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair

Cross Tip Screwdriver

Flat Tip Screwdriver

Combination Wrench Set

Socket Head Key Wrench Set

14 in. Pipe Wrench

SUPPLIES: Developer Heater

Plastic Pail (Item 35, Appendix E)

Rags (Item 47, Appendix E)

Teflon Tape (Item 66, Appendix E)

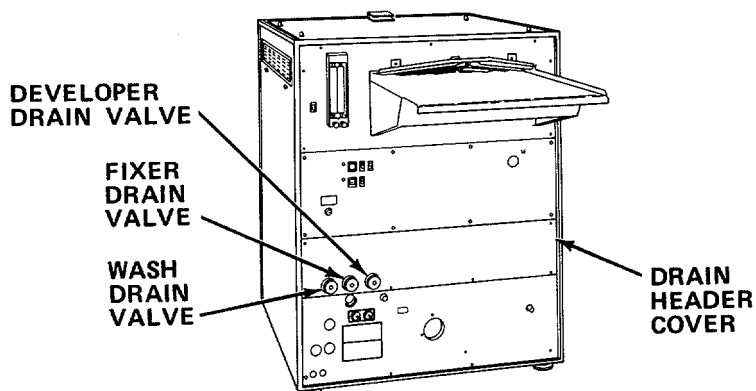
WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before beginning heater replacement.

NOTE

Developer tank must be drained prior to removal of developer heater.

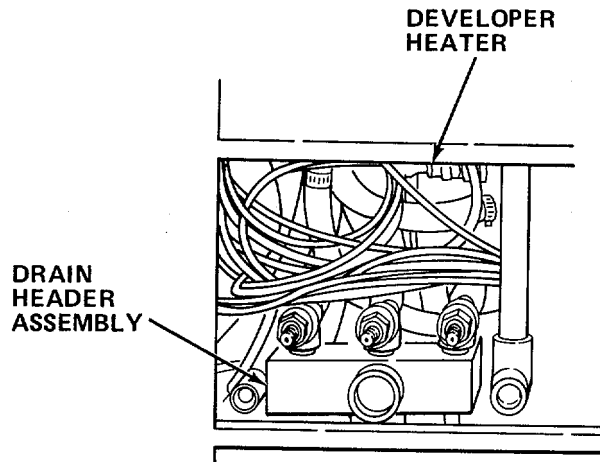
- a. Turn off processor circuit breaker.



- b. Remove screws retaining drain valve handles, and remove handles.
- c. Remove screws and remove drain header cover.

NOTE

Developer solution may be present in hoses. Use pail and rags to prevent spillage.



- d. Disconnect hoses from developer heater housing.
- e. Tag and disconnect wiring from developer heater at terminal blocks and from common ground.
- f. Remove two screws, bracket, and developer heater overtemperature thermostat (paragraph 5-16.28).
- g. Remove four socket head capscrews, two clamps, and developer heater and housing from mounting brackets.
- h. Holding heater housing with pipe wrench, loosen nut and remove defective heater from housing.
- i. Install new heater into housing. Apply teflon tape to threads and tighten nut securely.
- j. Reinstall developer heater assembly to mounting brackets. Secure with two clamps and four socket head capscrews.
- k. Reinstall developer heater overtemperature thermostat (paragraph 5-16.28).
- l. Connect new heater wiring to terminal blocks and to common ground.
- m. Reconnect hoses to developer heater housing, and tighten hose clamps.
- n. Replace drain header cover and secure with screws.
- o. Reinstall drain valve handles and secure with screws.
- p. Turn on processor circuit breaker.

5-16.28 Replace Developer Heater Overtemperature Thermostat.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

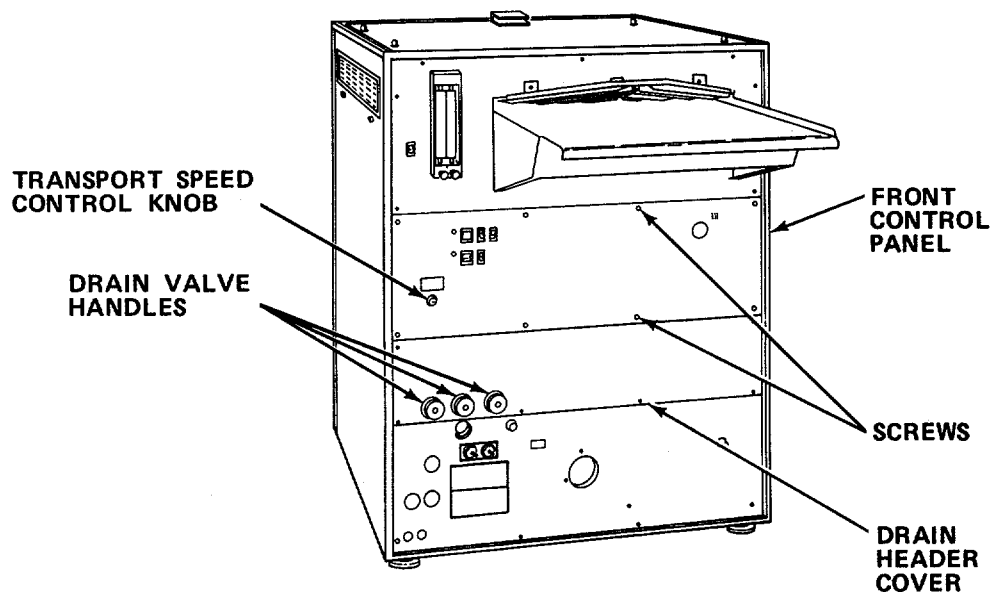
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Socket Head Key Wrench Set

SUPPLIES: Developer Heater Overtemperature Thermostat
 Thermal Grease (Item 67, Appendix E)

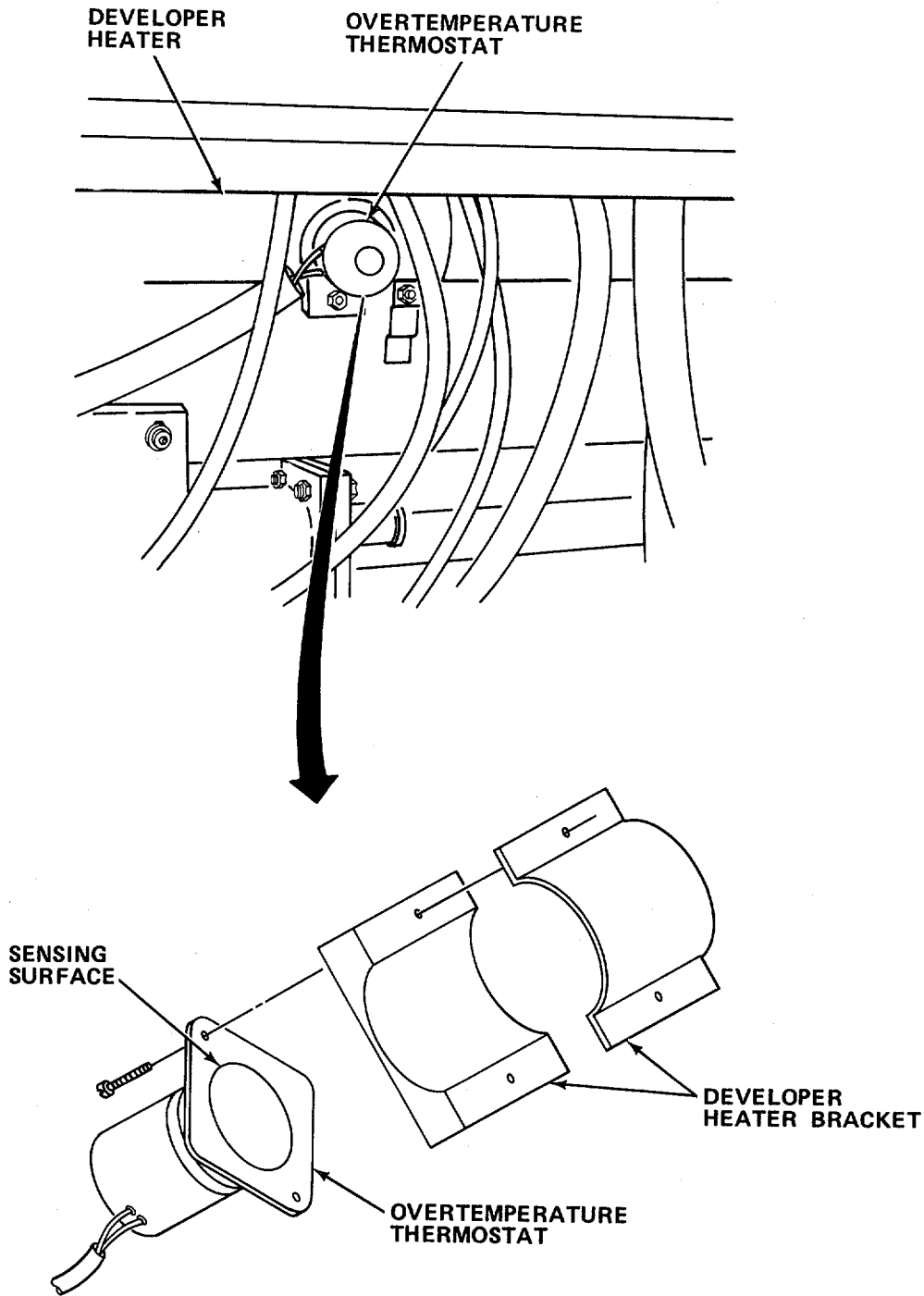
WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before beginning replacement of thermostat.

- a. Turn off processor circuit breaker.



- b. Remove TRANSPORT SPEED control knob.
 c. Remove screws and front control panel.
 d. Remove screws and drain valve handles.
 e. Remove screws and drain header cover.



- f. Remove two screws, bracket, and overtemperature thermostat from developer heater.
- g. Tag and disconnect thermostat wiring at terminal block.
- h. Push plastic strain relief up through processor frame until it separates enough to pull thermostat wiring through.

- i. Pull wiring through strain relief and remove defective overtemperature thermostat.
- j. Apply a thin coating of thermal grease to sensing surface of new thermostat.
- k. Install new thermostat to developer heater. Secure with bracket and two screws.
- l. Push new wiring through strain relief and make connections at terminal block.
- m. Push strain relief downward until it seats firmly into frame.
- n. Replace drain header cover and secure with screws.
- o. Reinstall drain valve handles and secure with screws.
- p. Reinstall front control panel and secure with screws.
- q. Reinstall TRANSPORT SPEED control knob. Tighten setscrew.
- r. Turn on processor circuit breaker.

5-16.29 Replace Control Unit A1.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

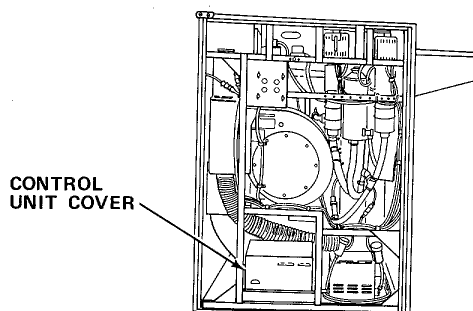
Tool Kit, Electronic Repair
 Cross Tip Screwdriver
 Flat Tip Screwdriver

SUPPLIES: Control Unit A1

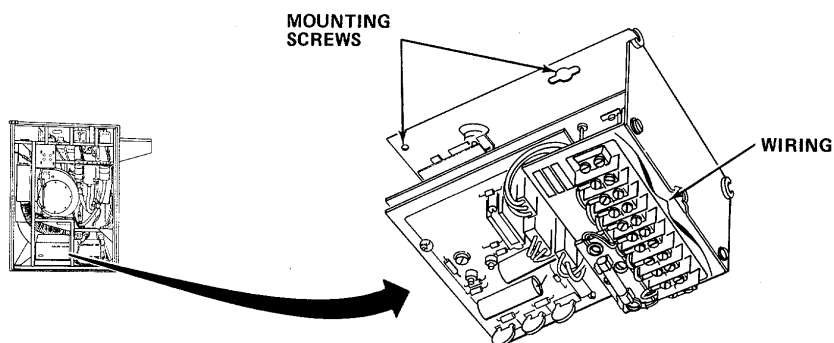
WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off processor circuit breaker.



- b. Remove left access panel.
- c. Remove retaining screws and control unit cover.



- d. Tag and disconnect wiring from control unit terminal board.

WARNING

High voltages that are capable of causing death may be stored in capacitor after power is removed. Be sure capacitor is discharged and reduced to zero volts.

- e. Remove four screws and control unit from processor base.
- f. Install new control unit to processor base, and secure with screws.
- g. Reconnect wiring to control unit terminal board.
- h. Reinstall control unit cover and left access panel.
- i. Turn on processor circuit breaker.

5-16.30 Replace Developer and Fixer Recirculation Pump Assemblies.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Cross Tip Screwdriver
Socket Head Key Wrench Set

SUPPLIES: Fixer Recirculation Pump Assembly
Developer Recirculation Pump Assembly
Wire Ties

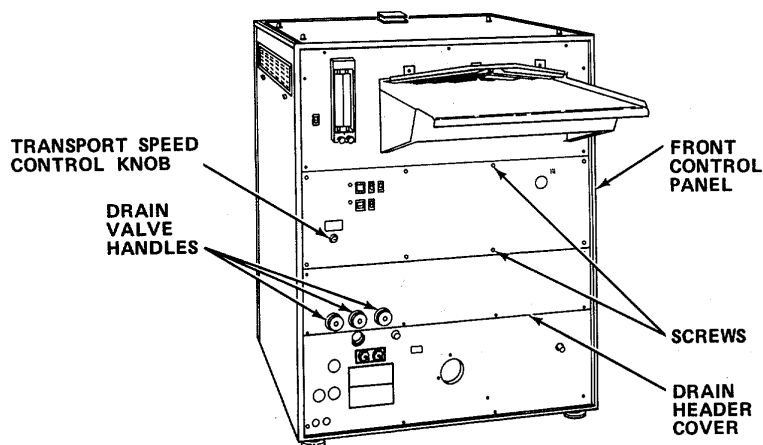
WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before beginning pump replacement.

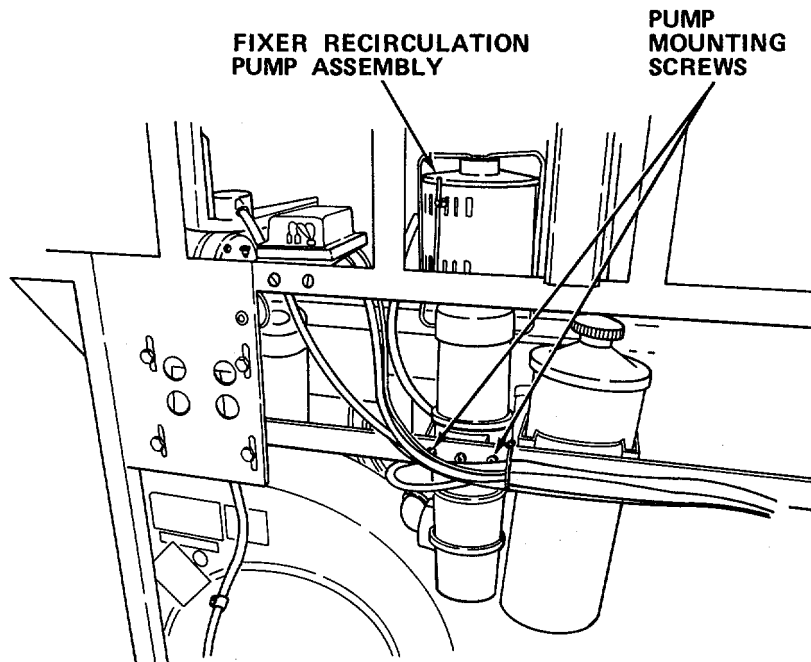
CAUTION

To prevent flooding and equipment damage, the processor tank respective to the pump assembly being replaced must be drained prior to beginning this task.

- a. Fixer Recirculation Pump Assembly.
- (1) Turn off processor circuit breaker.
 - (2) Remove top cover and left access panel.



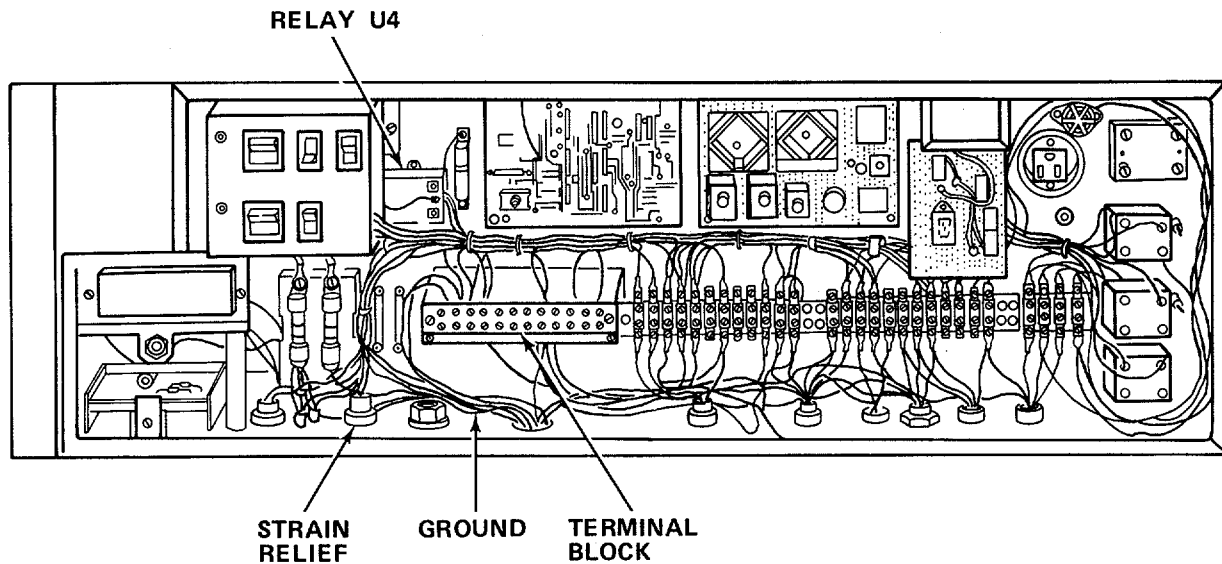
- (3) Loosen setscrew and remove TRANSPORT SPEED control knob.
- (4) Remove screws and front control panel.
- (5) Remove screws and drain valve handles.
- (6) Remove screws and drain header cover.
- (7) Remove fixer and developer pump splash cover.
- (8) Drain fixer tank.
- (9) Loosen three hose clamps securing hoses nearest the pump assembly.



NOTE

It is not necessary to remove the phenolic block that supports the pump housing.

- (10) Remove two screws and bracket, and release the pump assembly from processor frame.
- (11) Move pump assembly as necessary to remove three hoses. Remove hoses and move pump assembly aside.
- (12) Cut wire ties securing wiring to processor frame. Trace pump wiring to electrical control panel.



- (13) Push strain relief upward from frame until it separates sufficiently to allow passage of wiring. Tag and disconnect pump wiring from terminal block, relay U4, and from common ground.
- (14) Remove defective fixer recirculation pump assembly, with attached wiring, from processor.
- (15) Install new fixer recirculation pump assembly into processor.
- (16) Lead new pump wiring through frame to electrical control panel, and through strain relief.
- (17) Connect new wiring to terminal block, terminals on relay U4, and to common ground.
- (18) Push down on strain relief until it seats firmly.
- (19) Install new wire ties to wiring and processor frame.
- (20) Reattach hoses to hose fittings on new pump housing. Tighten hose clamps securely.
- (21) Install pump to processor frame and secure with bracket and two screws.
- (22) Replace fixer and developer pump splash cover.
- (23) Reinstall drain header cover and secure with screws.
- (24) Reinstall drain valve handles. Secure with screws.
- (25) Reinstall front control panel and secure with screws.
- (26) Reinstall TRANSPORT SPEED control knob. Tighten setscrew.
- (27) Refill fixer tank.

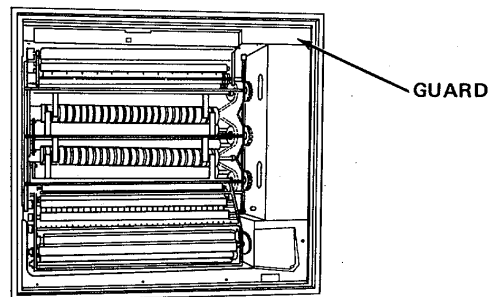
(28) Replace top cover and left access panel.

(29) Turn on processor circuit breaker.

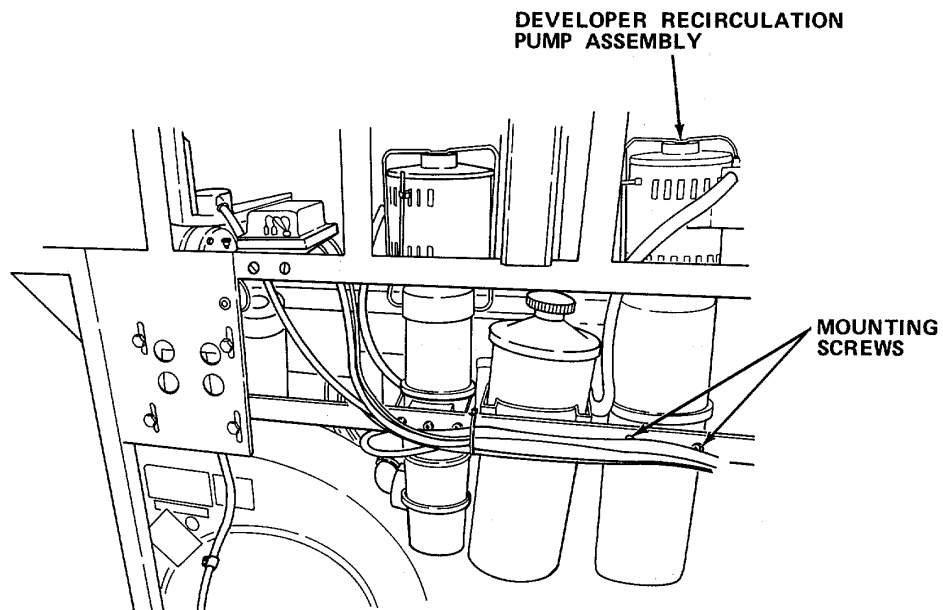
b. Developer Recirculation Pump Assembly.

(1) Perform steps a.(1) through a.(7).

(2) Drain developer tank.



(3) Remove screw and guard adjacent to developer recirculation pump.

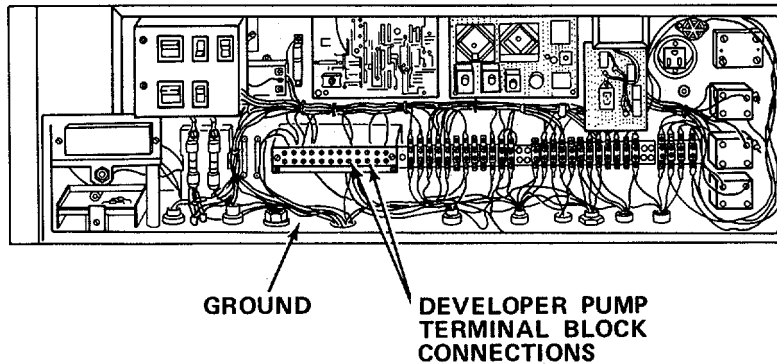


(4) Loosen three hose clamps securing hoses nearest the pump assembly.

NOTE

It is not necessary to remove the phenolic block that supports the pump housing.

- (5) Remove two screws and bracket, and release the pump assembly from processor frame.
- (6) Move developer recirculation pump assembly as necessary to remove three hoses. Remove hoses and move pump assembly aside.
- (7) Cut wire ties securing pump wiring to processor frame. Trace pump wiring to electrical control panel.



- (8) Push strain relief upward until it separates sufficiently to allow passage of wiring.
- (9) Tag and disconnect pump wiring from terminal block. Disconnect ground wire.
- (10) Remove defective developer recirculation pump assembly, with attached wiring, from processor.
- (11) Install new developer recirculation pump assembly into processor.
- (12) Lead new pump wiring through frame to electrical control panel, and through strain relief.
- (13) Connect new wiring to terminal block. Connect ground wire.
- (14) Perform steps a. (18) through a. (26).
- (15) Refill developer tank.
- (16) Reinstall guard and secure with screw.
- (17) Replace top cover and left access panel.
- (18) Turn on processor circuit breaker.

5-16.31 Remove/Install Processor.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: A minimum of three persons are required to perform this procedure.

TOOLS:

Tool Kit, Light Machine Repair

Cross Tip Screwdriver

Flat Tip Screwdriver

1/2 in. Drive Socket Set

12 in. Adjustable Wrench

Forklift

SUPPLIES: Plastic Utility Pail (Item 35, Appendix E)
Hose Clamps
Rags (Item 47, Appendix E)
Rubber Spray Adhesive (Item 3, Appendix E)
Safety Glasses

WARNING

Death or serious injury may occur from electrical shock unless processor circuit breaker is turned off before servicing.

- a. Turn off circuit breaker.
- b. Remove left and right access panels from processor.
- c. Remove all rack assemblies and crossovers and store in designated area.
- d. Tag and disconnect processor electrical connections at junction box.

WARNING

Injury from chemical burns or blindness may occur if photographic chemicals splash in eyes or on sensitive skin areas. Wear eye protection and be sure eyewash and running water are available before working on processor.

- e. Drain chemicals and water from processor.

NOTE

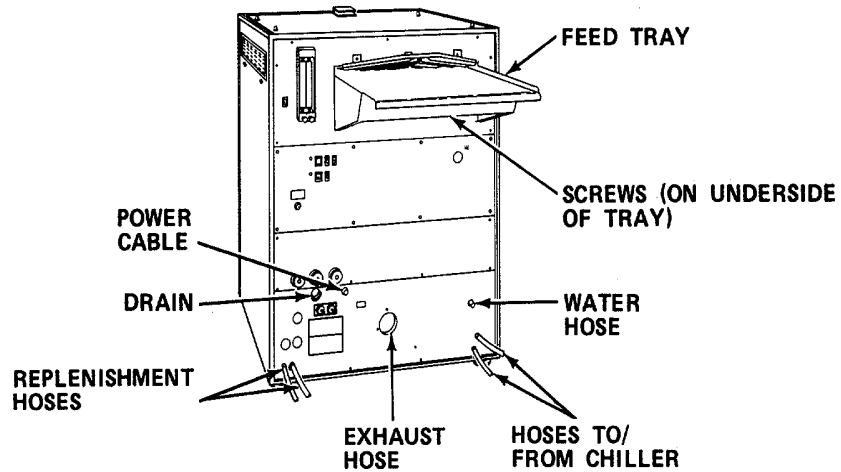
Last of chemical solutions will have to be drained into pail or drip pan as lowest points will not normally flow into drains.

WARNING

Wipe all spills quickly to prevent serious injury or damage to equipment.

NOTE

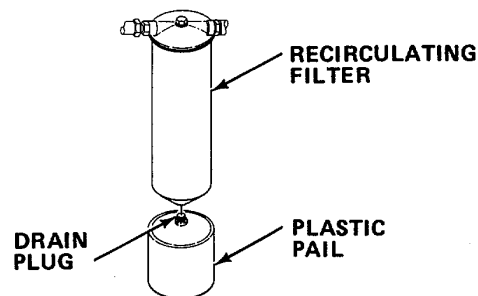
Tag all hoses before disconnecting.



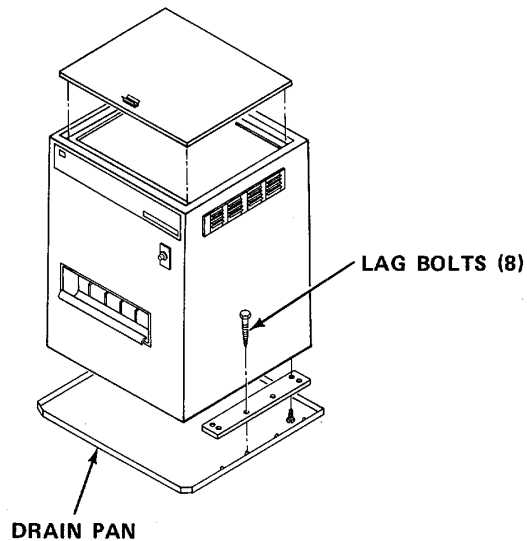
- f. Remove feed tray from processor.
- g. Disconnect chiller hoses from inside of processor cabinet.
- h. Disconnect replenisher hoses from inside of processor cabinet.
- i. Disconnect drain hose from processor.
- j. Disconnect exhaust hose from processor vent.

NOTE

Be sure WATER SUPPLY Valve is in the off position before disconnecting water supply line.



- k. Place pail or drip pan under recirculating filter.
- l. Remove drain plug from recirculating filter and drain into pail.
- m. Disconnect water supply line from processor.



- n. Remove eight lag bolts mounting processor through drain pan to floor.
- o. Remove flip-top platemaker (Chapter 2, paragraph 2-16.22).
- p. Remove plate finishing table (Chapter 3, paragraph 3-16.6).
- q. Remove sink (Chapter 4, paragraph 4-16.3).
- r. Remove processor from partition and remove from the section through van's rear doors.

NOTE

If rubber insulating material around position opening has been damaged during removal of defective processor, replace material using rubber adhesive.

- s. Install new processor into partition and secure with eight lag bolts.
- t. Reconnect all hoses to new processor. Tighten hose clamps securely.
- u. Reconnect drain and water supply lines.
- v. Reconnect exhaust hose to vent.

- w. Reconnect power cable.
- x. Reinstall sink (Chapter 4, paragraph 4-16.3).
- y. Reinstall plate finishing table (Chapter 3, paragraph 3-16.6).
- z. Reinstall flip-top platemaker (Chapter 2, paragraph 2-16.22).

5-17. PREPARATION FOR STORAGE OR SHIPMENT . Contact your battalion for packing and shipping instructions.

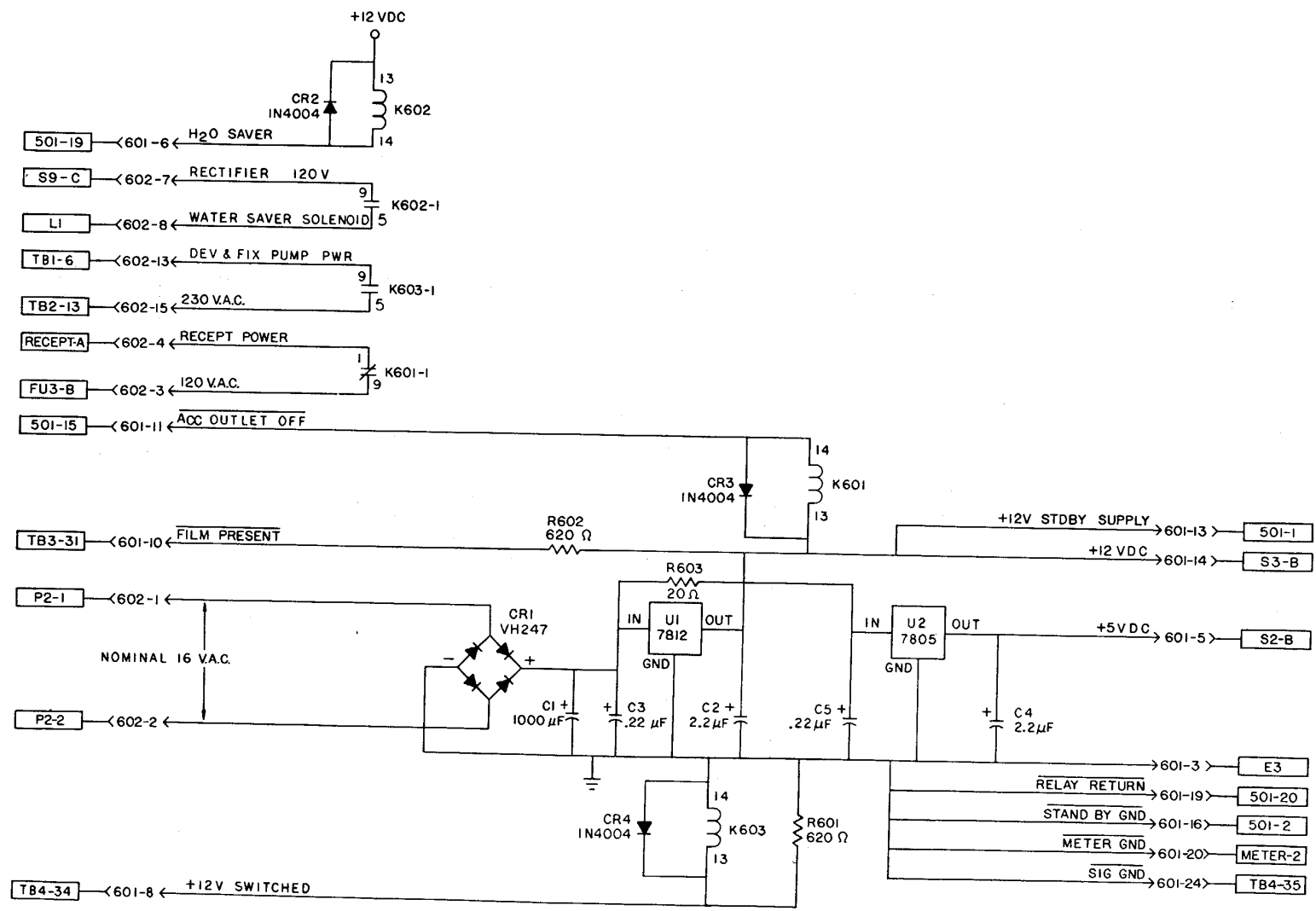
Section V. DIRECT/GENERAL SUPPORT MAINTENANCE

5-18. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT.

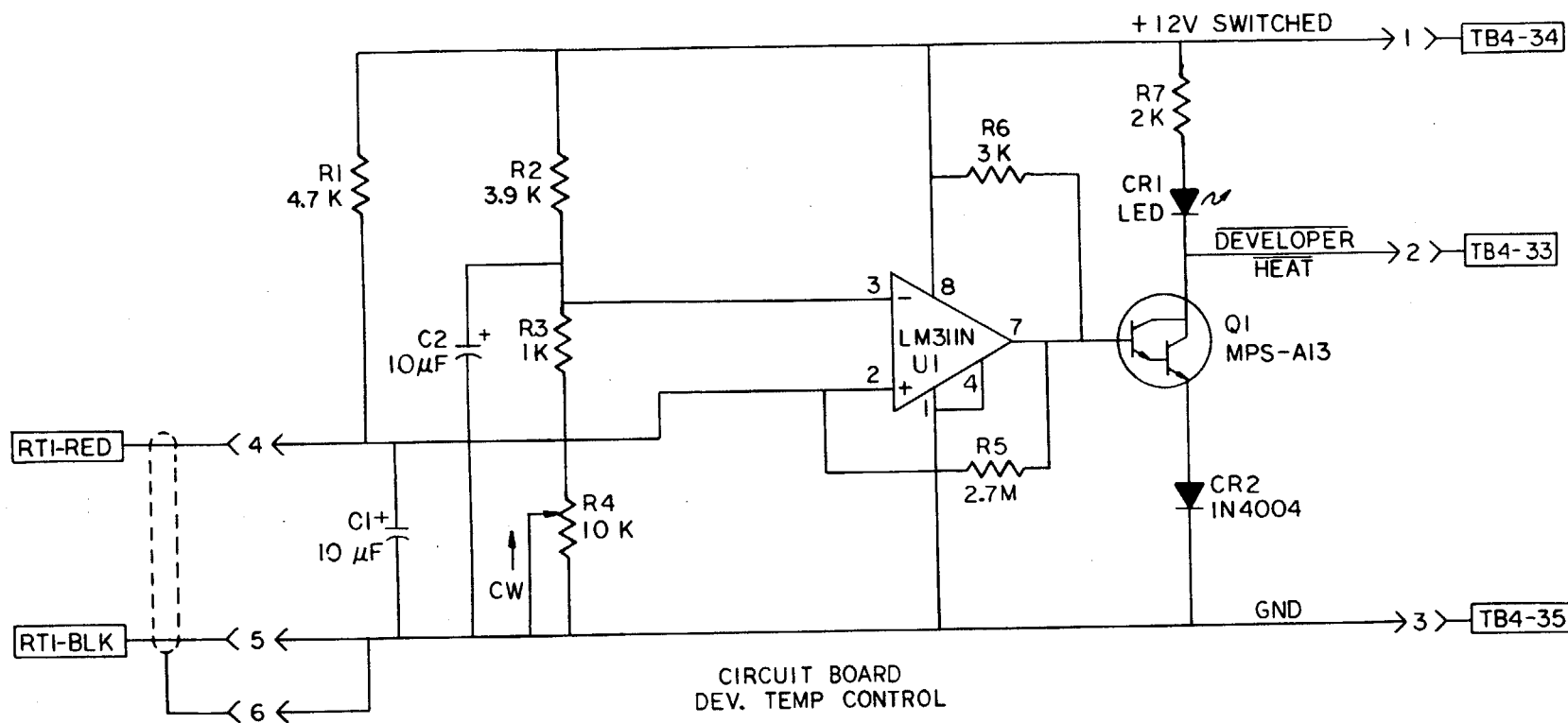
- 5-18.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.
- 5-18.2 Special Tools; Test, Measurement, and Diagnostic Equipment; and Support Equipment. Special Tools, TMDE, and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.
- 5-18.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-3610-285-24P covering direct/general support maintenance for this equipment.

5-19. DIRECT/GENERAL SUPPORT TROUBLESHOOTING PROCEDURES.

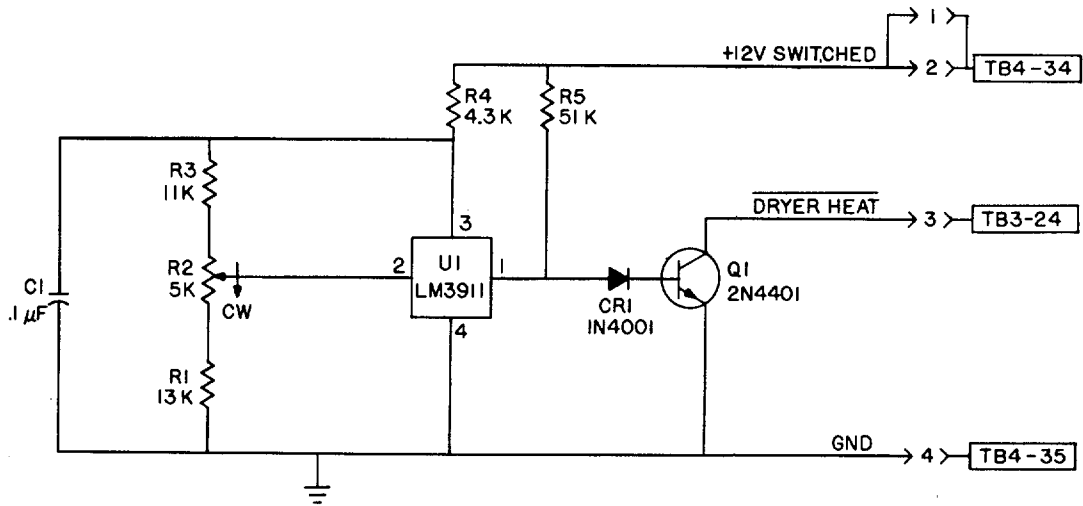
- a. Direct/general support troubleshooting procedures cover the most common malfunctions that may be repaired at the direct/general support level. Repair or adjustment requiring specialized equipment is not authorized unless such equipment is available. Troubleshooting procedures used by lower level 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.
- c. For unidentified malfunctions use the following schematics or the foldouts located at the end of this manual for further fault analysis.



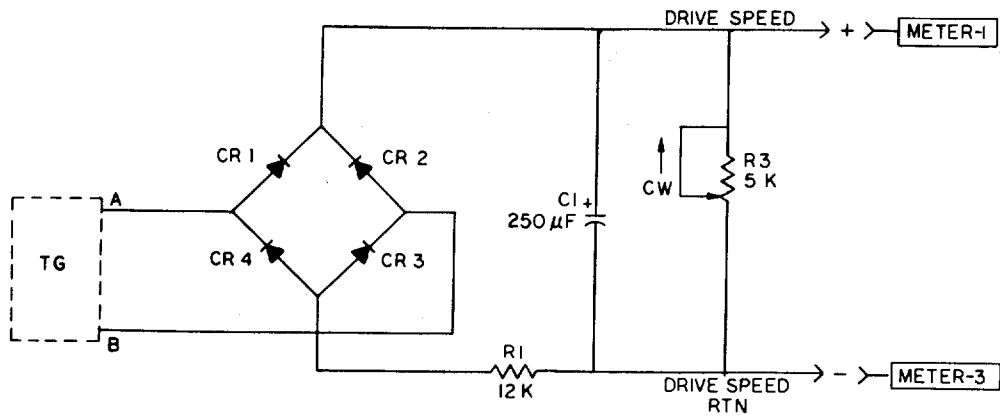
POWER SUPPLY CIRCUIT BOARD 600



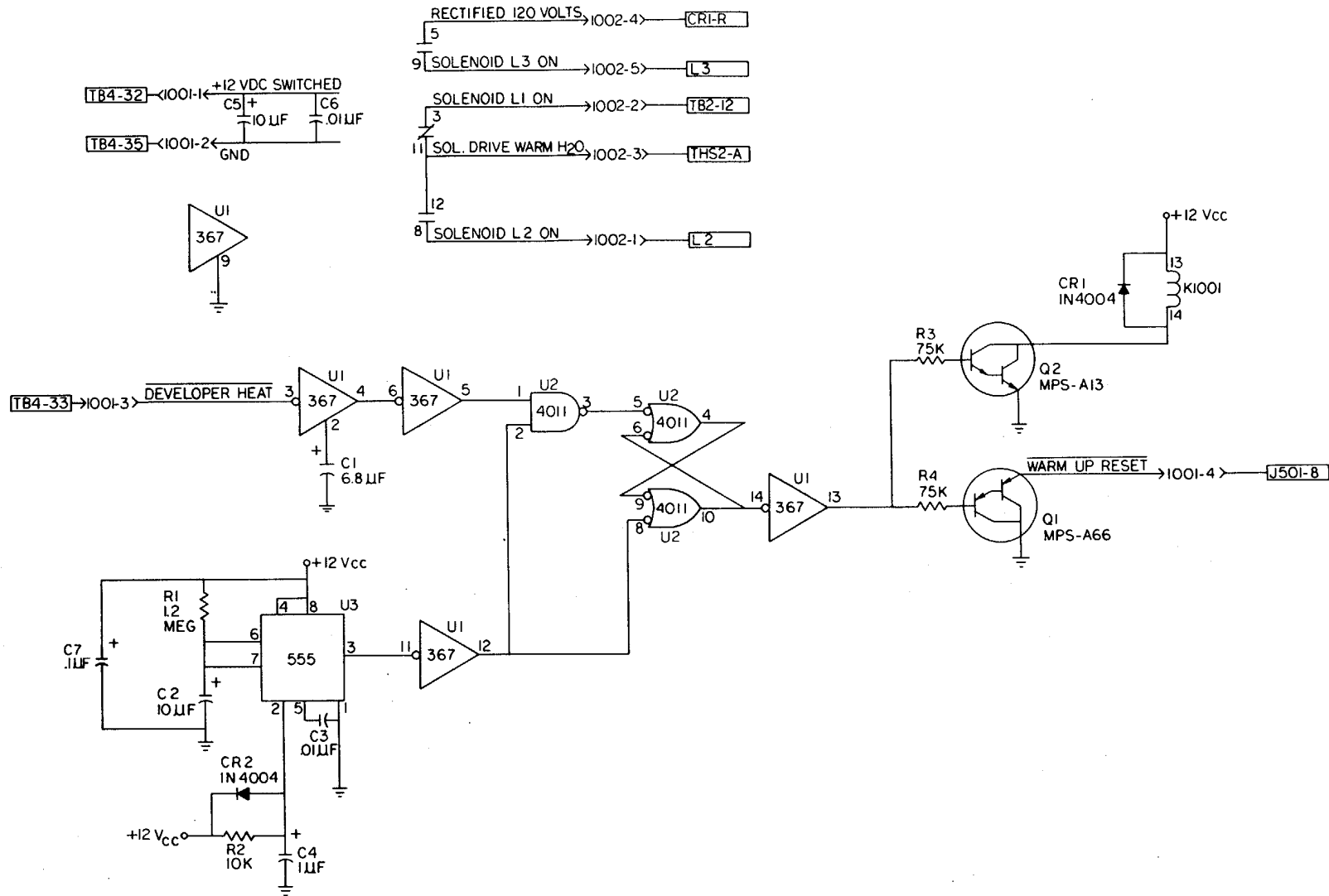
CIRCUIT BOARD 700 DEV. TEMP CONTROL



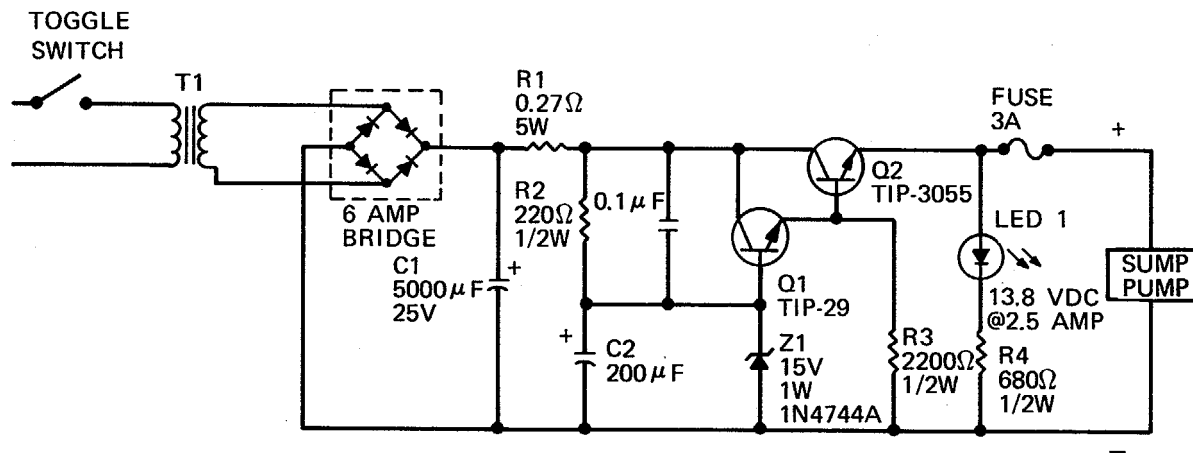
DRYER TEMP CONTROL PCB 800



METER CONTROL PCB 900



WATER CONTROL CIRCUIT BOARD 1000



12V Power Supply for Sump Pump

Table 5-6. DIRECT/GENERAL SUPPORT TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. FILM DOES NOT TRAVEL THROUGH SQUEEGEE ASSEMBLY.	Check for damaged rollers in crossover.	Remove, inspect, and repair crossover assembly as necessary (paragraph 5-20.2).
2. REPLENISHER PUMP OPERATES BUT DOES NOT MOVE LIQUID.	Check for damaged impeller in pump.	Remove, inspect, and repair pump as necessary (paragraph 5-20.3).
3. DEVELOPER OR FIXER RECIRCULATION PUMP OPERATES BUT DOES NOT MOVE LIQUID.	Check for damaged pump.	Remove, inspect, and repair pump as necessary (paragraph 5-20.4).
4. FILM DOES NOT TRANSPORT CORRECTLY THROUGH RACK ASSEMBLIES.	Check for damaged rack.	Remove, inspect, and repair rack assembly as necessary (paragraph 5-20.5 for developer rack or paragraph 5-20.6 for fixer or wash rack).

5-20. MAINTENANCE PROCEDURES.

a. This section contains instructions covering direct/general support maintenance functions for the film processor. 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

PROCEDURE	PARAGRAPH
Repair Entrance Crossover Assembly	5-20.1
Repair Squeegee Crossover Assembly	5-20.2
Repair Replenisher Pump Assembly	5-20.3
Repair Developer and Fixer Recirculation Pump Assemblies	5-20.4
Repair Developer Rack Assembly	5-20.5
Repair Fixer and Wash Rack Assembly	5-20.6
Replace Recirculation Tank.....	5-20.7

5-20.1 Repair Entrance Crossover Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

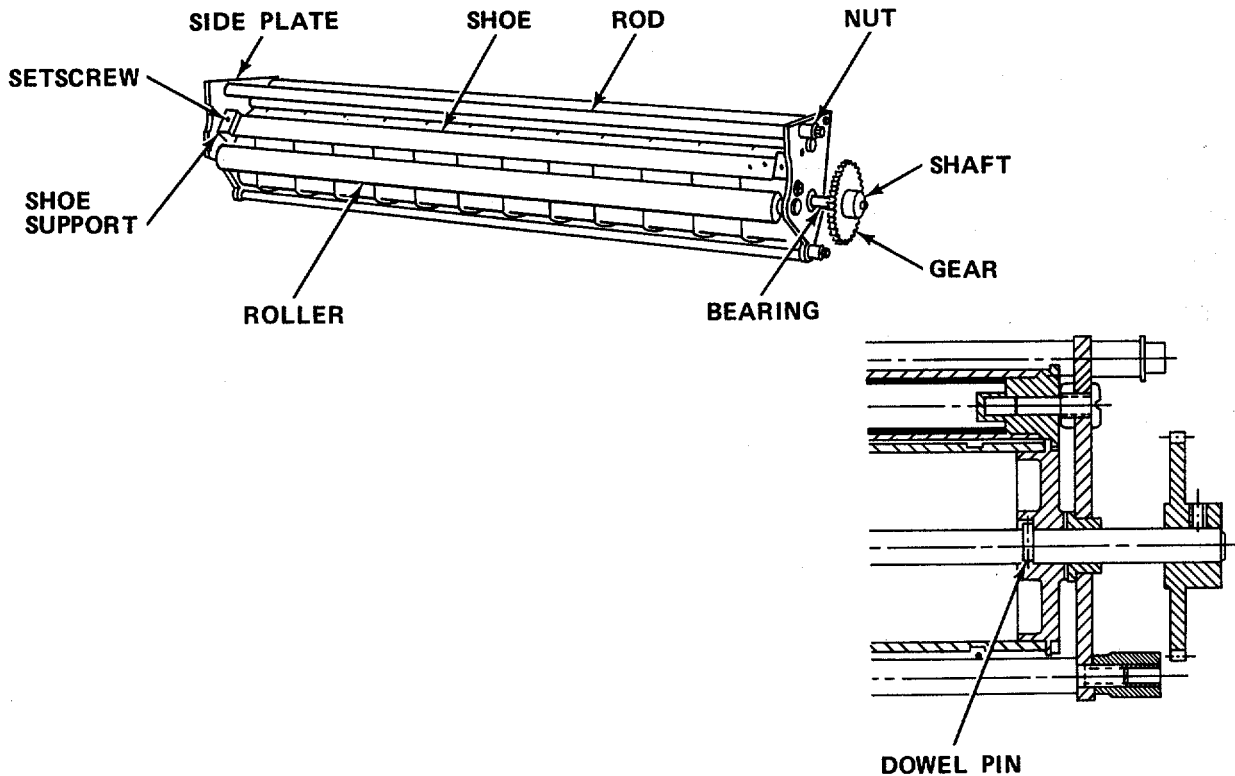
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Socket Head Key Wrench Set
 Combination Wrench Set

SUPPLIES: Main Roller Bearings
 Shoe
 Side Roller Bearing Studs
 Roller Assembly
 Gear
 Roller

NOTE

The following procedure is in disassembly/assembly sequence. Disassemble the entrance crossover assembly only as far as necessary to perform the repair.

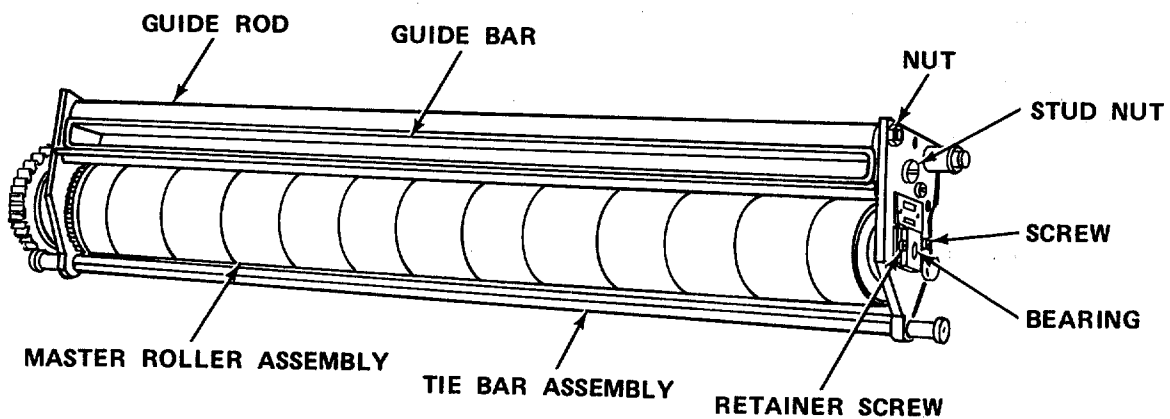
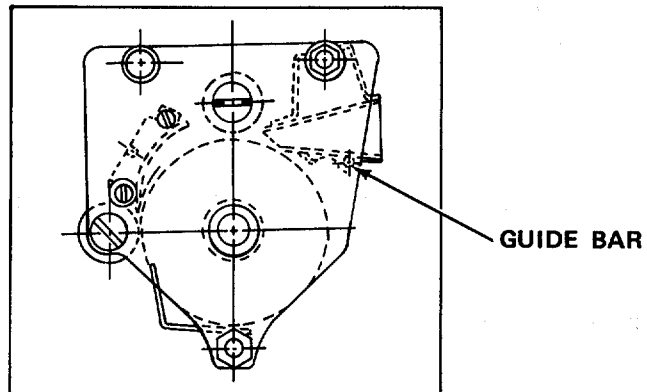
- a. Remove entrance crossover assembly from unit.



NOTE

Measure and record distance between gear and end of shaft.

- b. Loosen setscrew and remove gear and key from roller shaft.
- c. Remove three nuts connecting left end plate to tie rods.
- d. Remove two screws and washer connecting guide shoe support to left side plate.
- e. Remove two screws connecting tie rods to left side plate. Remove left side plate.



- f. Remove roller assemblies from right side plate.
- g. Unscrew and remove bearing studs and nuts from end plates.
- h. Remove main roller bearings from left side plate.

- i. Remove screws from bearing retainer on right side plate. Remove retainer and bearing.
- j. Inspect components for damage or excessive wear. Replace any defective components.
- k. Install main roller bearings to side plates.
- l. Reinstall bearing retainer to right side plate.
- m. Install bearing studs in side plates and secure with nuts.
- n. Position rollers on right side plate and install left side plate.
- o. Position guide shoe support to left side plate and secure with screws and washers.

NOTE

Be sure to square end plates before securing tie rods.

- p. Reinstall nut to entrance guide tie rod and tighten. Position other tie rod and secure with nut.
- q. Reinstall key to main roller shaft.
- r. Reinstall gear to roller shaft. Secure with setscrew.
- s. Reinstall entrance crossover assembly into unit.

5-20.2 Repair Squeegee Crossover Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

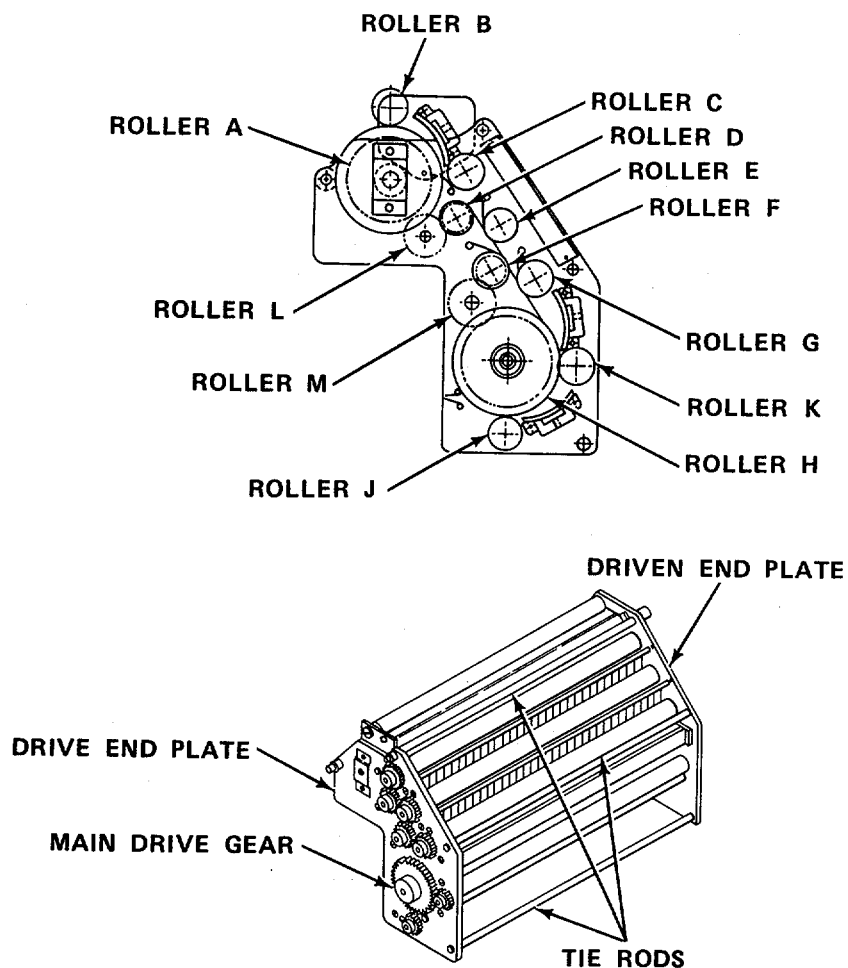
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Drift Punch
 Pliers
 1/4 in. Drive Socket Set

SUPPLIES: Roller
 Bearing
 Gear
 Retaining Pin

NOTE

The following procedure is in disassembly/assembly sequence. Disassemble the squeegee crossover assembly only as far as necessary to perform the repair.

- a. Remove squeegee crossover assembly from unit.



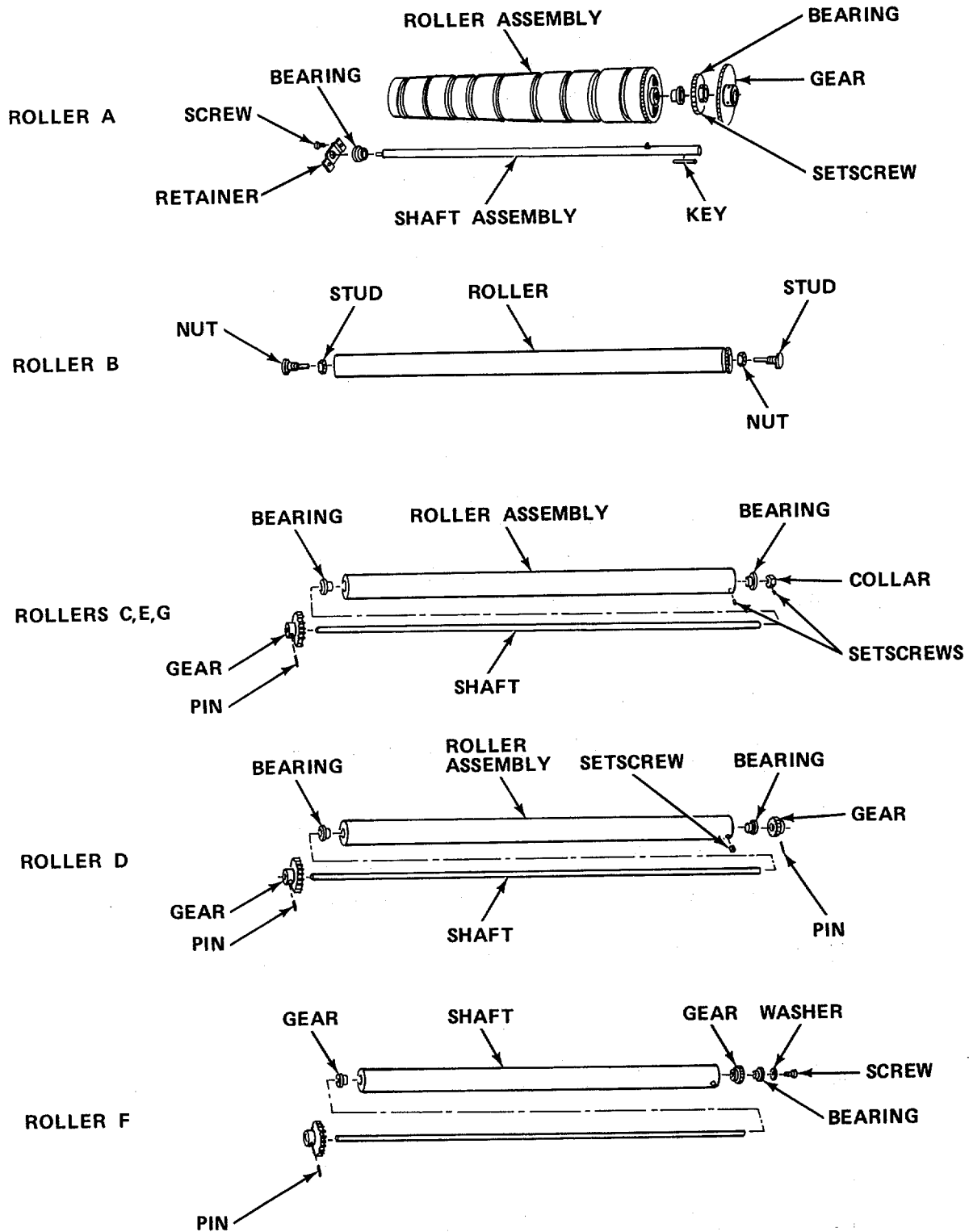
- b. Drive out 1/8 in. (3.2 mm) retaining pin and remove main drive gear from roller H.
- c. Remove 1/16 in. (1.6 mm) pins and gears from idle end of rollers C, D, E, F, G, J, and K.
- d. Remove screws retaining rollers L and M to drive end plate.
- e. Remove studs retaining roller B to drive end plate.

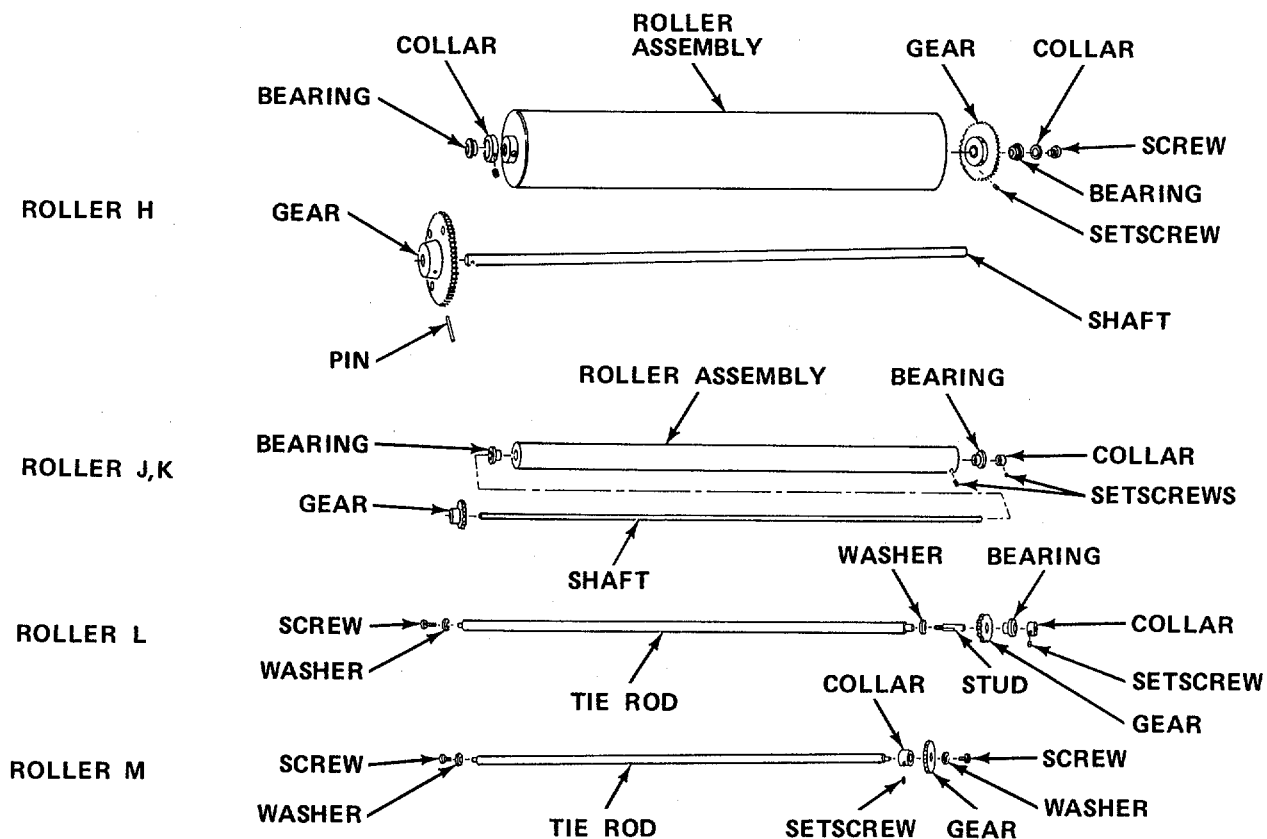
NOTE

Note position and location of film guides before removing.

- f. Remove screws retaining film guides to end plates and remove film guides.
- g. Remove nuts and screws retaining tie rods to end plates.

- h. Remove guide shoe support retaining screws and remove drive end plate from rollers.
- i. Remove retaining screws from idle end plate and remove guide shoe assembly.





- j. Inspect components for damage or excessive wear. Disassemble rollers and replace any defective components.
- k. Reinstall guide shoe assembly to idle end plate and retain with screws.
- l. Reassemble rollers and reinstall to idle end plate.
- m. Position rollers and reinstall drive end plate.
- n. Position guide shoe and retain support with screws to drive end plate.
- o. Position tie rods, square end plates, and secure with nuts and screws.
- p. Reinstall film guides in their proper position and retain with screws.
- q. Reinstall roller B retaining stud into drive end plate.
- r. Reinstall screws retaining rollers L and M to drive end plate.
- s. Reinstall gears to drive end of rollers C, D, E, F, G, J, and K. Retain with 1/16 in. (1.6 mm) pins.
- t. Reinstall main drive gear to roller H. Retain with 1/8 in. (3.2 mm) pin.
- u. Reinstall squeegee crossover assembly into unit.

5-20.3 Repair Replenisher Pump Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
Cross Tip Screwdriver
Flat Tip Screwdriver
Combination Wrench Set

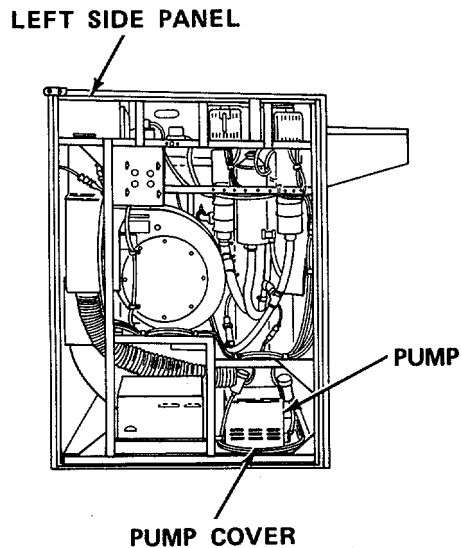
SUPPLIES: Centrifugal Pump
Tape, Electrical (Item 59, Appendix E)
O-ring
Housing and Impeller Assembly
Housing
Capacitor
Drain Pan

- a. Drain system by opening processor drain valves.

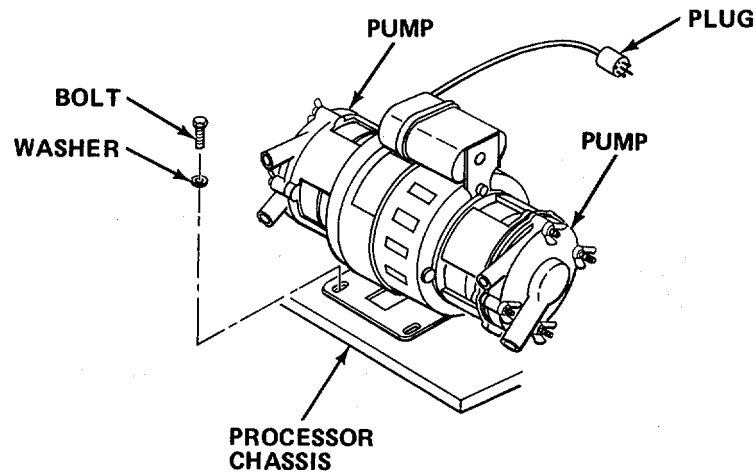
WARNING

Death or serious injury may occur from electrical shock unless main circuit breaker is turned off before servicing.

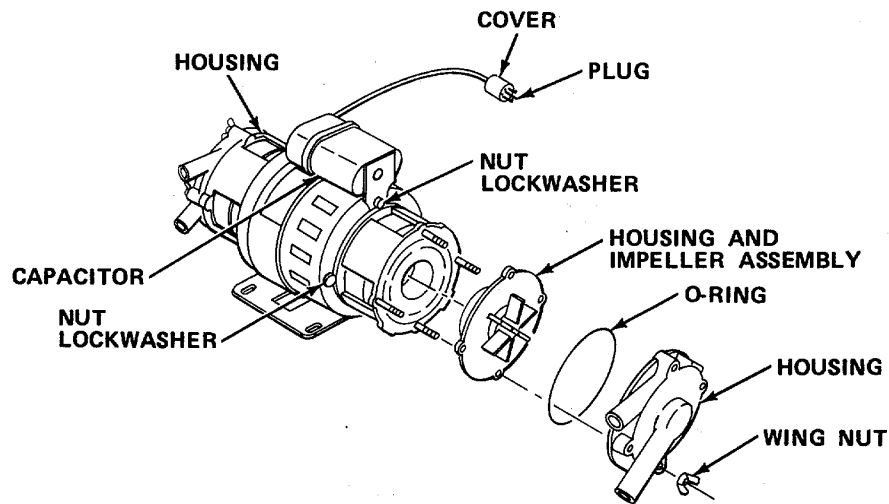
- b. Turn off processor circuit breaker.



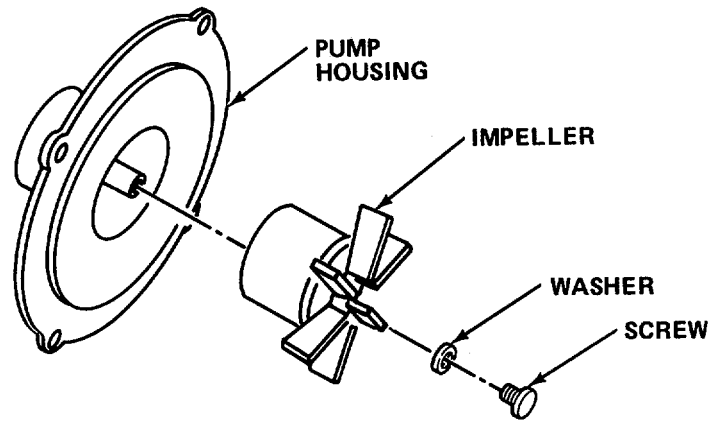
- c. Remove left access panel and pump cover.



- d. Remove plug from pump motor.
- e. Disconnect hose between processor and replenisher storage tanks.
- f. Loosen strainer caps to vent hose.
- g. Disconnect hose from pump and drain excess liquid from hoses.
- h. Remove two hex bolts and flat washers that attach pump unit to chassis. Remove pump.



- i. Loosen top nut retaining capacitor screw to pump.
- j. Move capacitor to side and disconnect wiring. Remove capacitor.
- k. Remove wingnuts and outer pump housing.
- l. Remove inner housing and impeller assembly.
- m. Remove 0-ring and discard.



- n. Remove screw, washer and impeller from inner housing.
- o. Inspect components for damage or excessive wear. Replace any defective components.
- p. Install impeller into inner housing. Retain with screw and washer.
- q. Reinstall inner housing and impeller assembly.
- r. Install new O-ring into groove of outer housing.
- s. Reinstall outer housing and retain with wingnuts.

- t. Connect wiring to capacitor and install capacitor onto pump unit. Retain with lockwasher and nut.
- u. Reinstall pump and secure with bolts and washer to processor chassis.
- v. Reconnect tubing to pump.
- w. Close strainer caps and reconnect tubing between processor and replenisher tanks.
- x. Reconnect plug to pump motor. Tape plug connectors together with electrical tape.
- y. Reinstall pump cover and left access panel.

5-20.4 Repair Developer and Fixer Recirculation Pump Assemblies.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
 Cross Tip Screwdriver
 Flat Tip Screwdriver

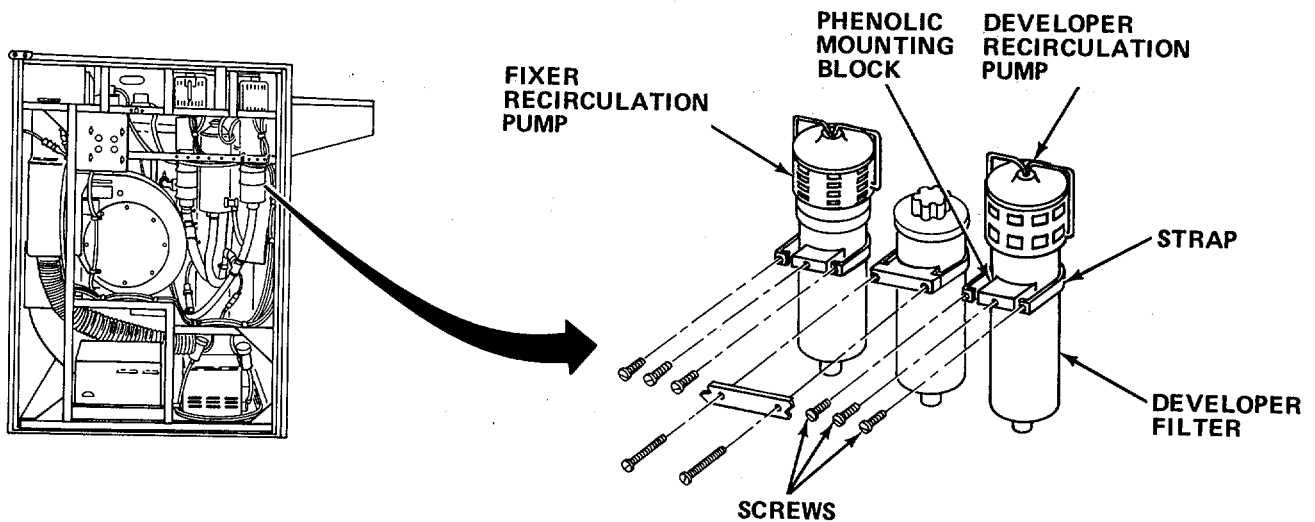
SUPPLIES: O-Rings
 Motor/Pump Assemblies
 Capacitors
 Bearings
 Rings

- a. Open DEV or FIXER drain valve and drain appropriate solution tank.

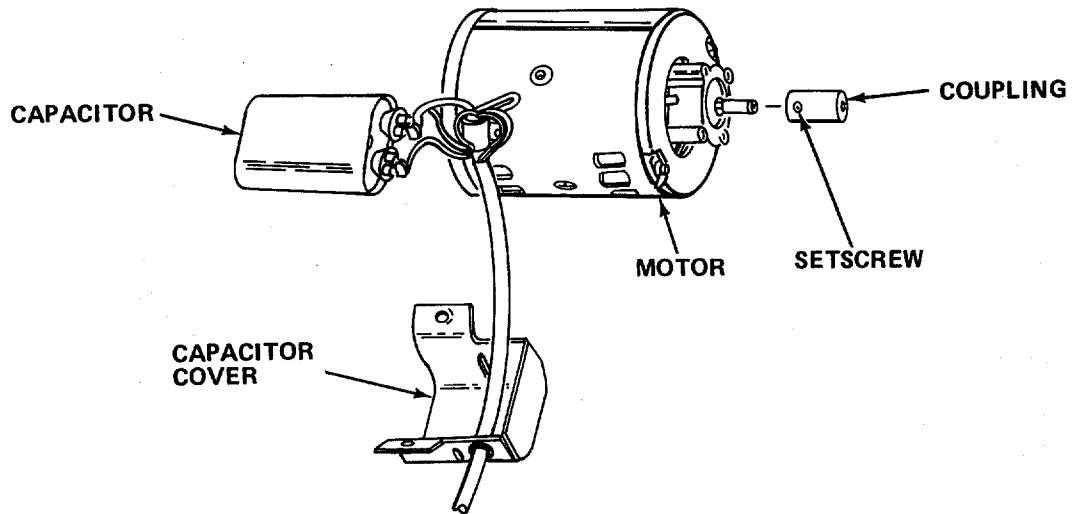
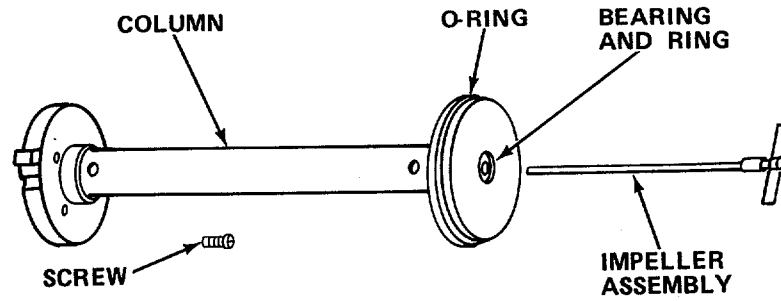
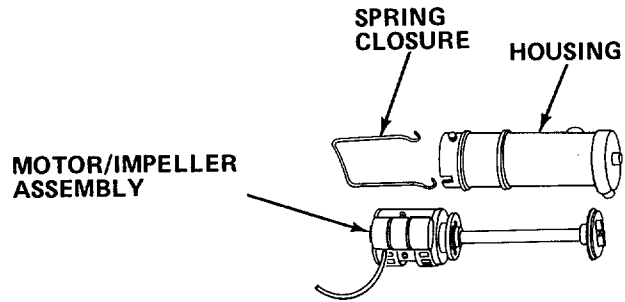
WARNING

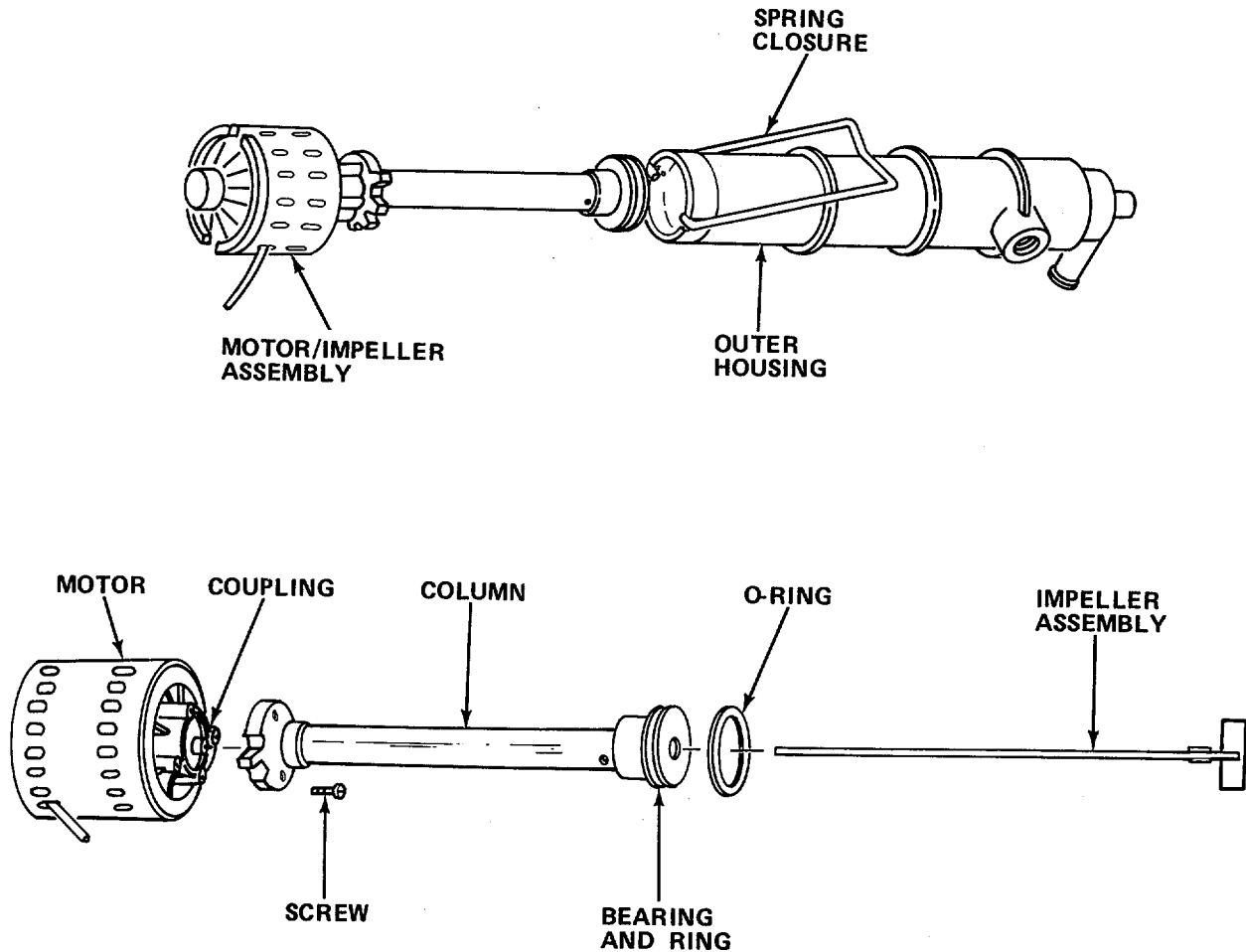
Death or serious injury may occur from electrical shock unless processor circuit breaker is turned OFF before servicing.

- b. Turn off processor circuit breaker.
- c. Remove left access panel, and top cover.
- d. Remove pump splash cover.



- e. Label and disconnect motor power cord from processor control panel.





- f. Release spring closure and remove defective motor/pump assembly from housing.
- g. Remove O-ring from lower groove in column.
- h. Install new O-ring to lower column groove in new motor/pump assembly.
- i. Install new motor/pump assembly to housing and retain with spring closure.
- j. Reconnect motor power cord to processor control panel.
- k. Reinstall pump splash cover, top cover and left access panel.
- l. Close drain valve.
- m. Service processor tank.
- n. Turn on processor circuit breaker.

5-20.5 Repair Developer Rack Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

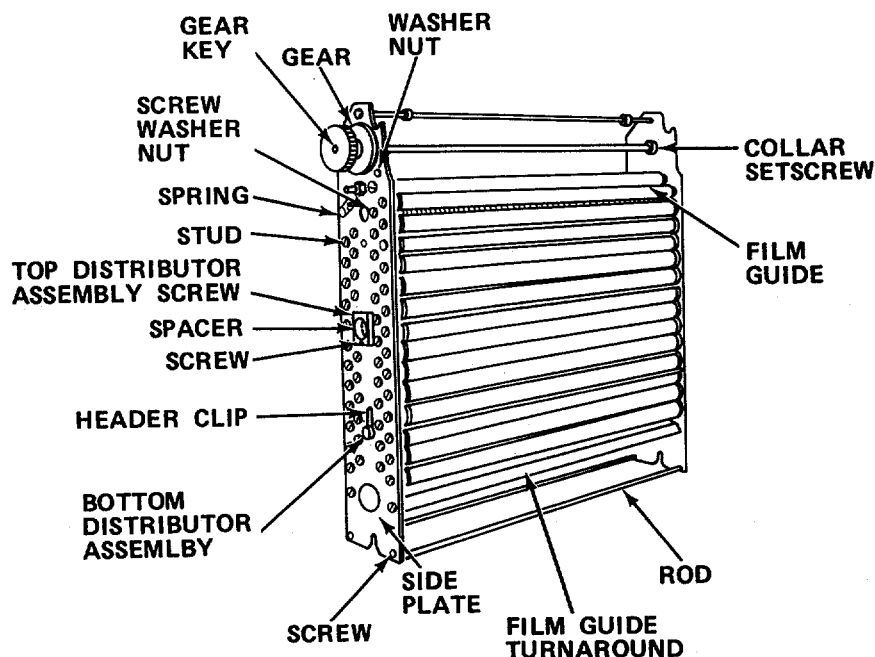
Tool Kit, Light Machine Repair
 Cross Tip Screwdriver
 Flat Tip Screwdriver
 Combination Wrench Set
 1/4 in. Drive Socket Set

SUPPLIES: Gudgeon, Gear
 Gudgeon, Sprocket
 Gudgeon, Plain
 Stud
 Gear
 Bearing
 Idler
 Key
 Sprocket
 Chain

NOTE

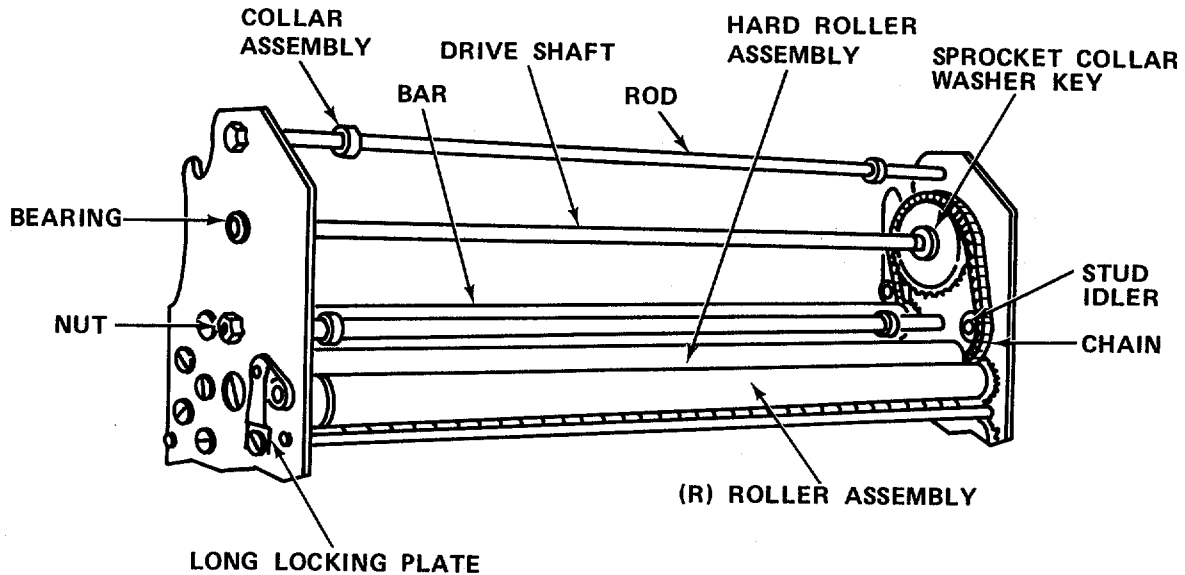
The following procedure is in disassembly/assembly sequence. Disassemble the developer rack assembly only as far as necessary to perform the repair.

- a. Remove developer rack assembly from processor.

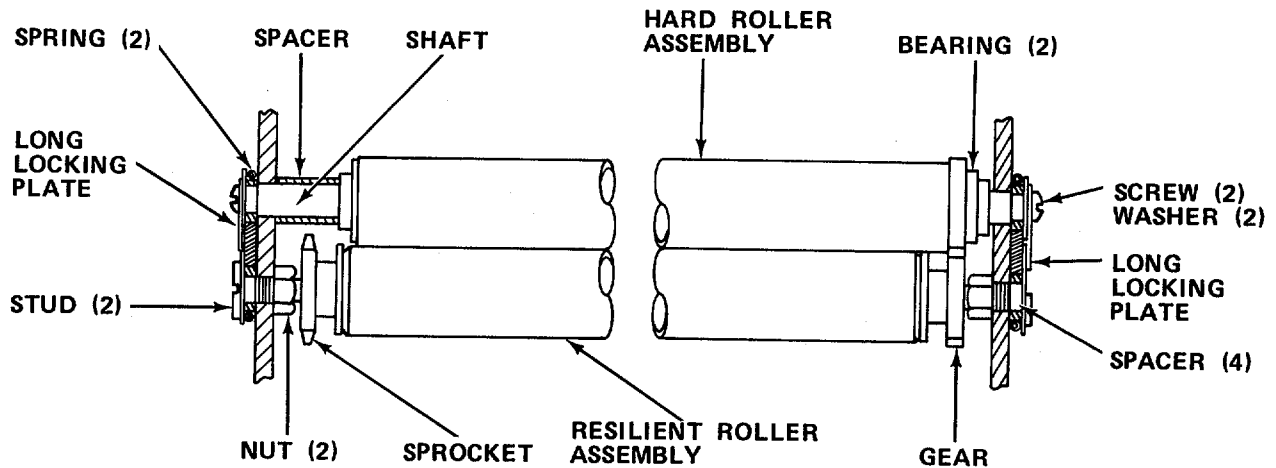


- b. Loosen setscrew and remove main drive gear from main drive shaft.

- c. Loosen setscrew and remove inner gear from shaft. Remove key from shaft.
- d. Loosen setscrews on collars on main drive shaft.



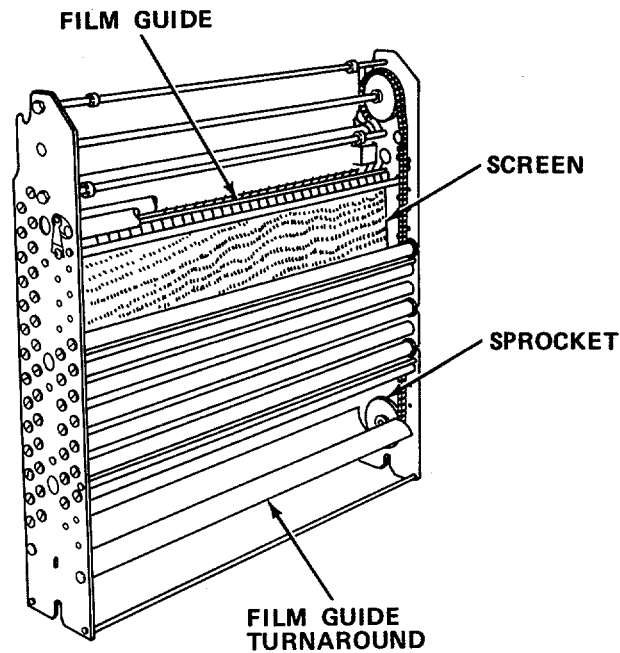
- e. Remove studs and chain idlers from left end plate.
- f. Remove main drive shaft, collars, chain sprocket, key, and washers from rack.
- g. Remove screws, washers, locking plates, and springs from end of exit roller assembly.



NOTE

Keep all components of each roller assembly together. Tag each roller assembly to be sure of proper reassembly.

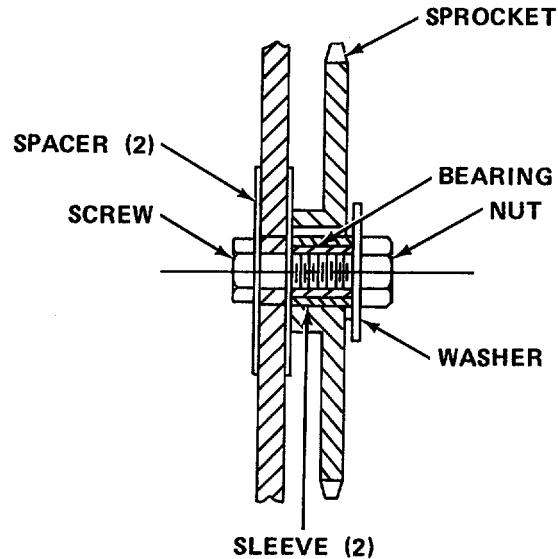
- h. Remove shaft from exit roller assembly.
- i. Remove exit roller assembly, spacer, and bearings from between end plates.
- j. Loosen nut and remove each stud from ends of resilient roller assembly. Tag and remove roller assembly. Keep all components of roller assembly together.

**NOTE**

Several other rollers must be removed to gain access to an inner roller.

- k. Locate defective roller and pry out roller stud from right end plate opposite chain end.
- l. Remove roller assembly.
- m. Remove roller stud from left end plate if defective.
- n. Pry chain link apart and remove chain.
- o. Inspect all components for excessive wear or damage. Replace any defective components.

- p. Wash all components in warm, soapy water. Rinse, and dry components thoroughly.
- q. Install drive chain to left end plate sprockets. Close link.
- r. Install roller stud to left end plate.
- s. Reinstall roller assemblies to their proper positions. Retain with studs. Remove tags.
- t. Reinstall resilient roller assembly and retain with studs and nuts.
- u. Reinstall exit roller assembly, spacer, and bearings. Insert shaft and secure with springs, locking plates, washers, and screws.



- v. Reinstall washers, key, chain sprockets, collars, and drive shaft to end plates.
- w. Reinstall chain idlers and studs to left end plate.
- x. Adjust adjustable chain idler until chain is tight.
- y. Position main drive shaft collars against bearing in right end plate and sprocket. Tighten setscrews.
- z. Reinstall key and inner gear to main drive shaft. Tighten setscrew.
- aa. Reinstall main drive gear to main drive shaft. Tighten setscrew.
- ab. Reinstall developer rack assembly into processor.

5-20.6 Repair Fixer and Wash Rack Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

- Tool Kit, Light Machine Repair
- Cross Tip Screwdriver
- Flat Tip Screwdriver
- Combination Wrench Set
- 1/4 in. Drive Socket Set

- SUPPLIES:
- Gudgeon, Gear
 - Gudgeon, Sprocket
 - Gudgeon, Plain
 - Stud
 - Gear
 - Bearing
 - Idler
 - Key
 - Sprocket
 - Chain

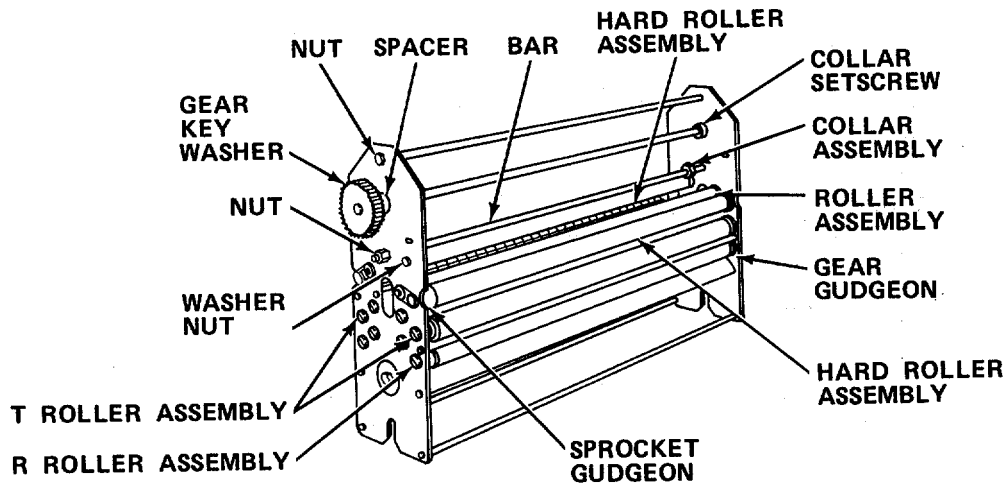
CAUTION

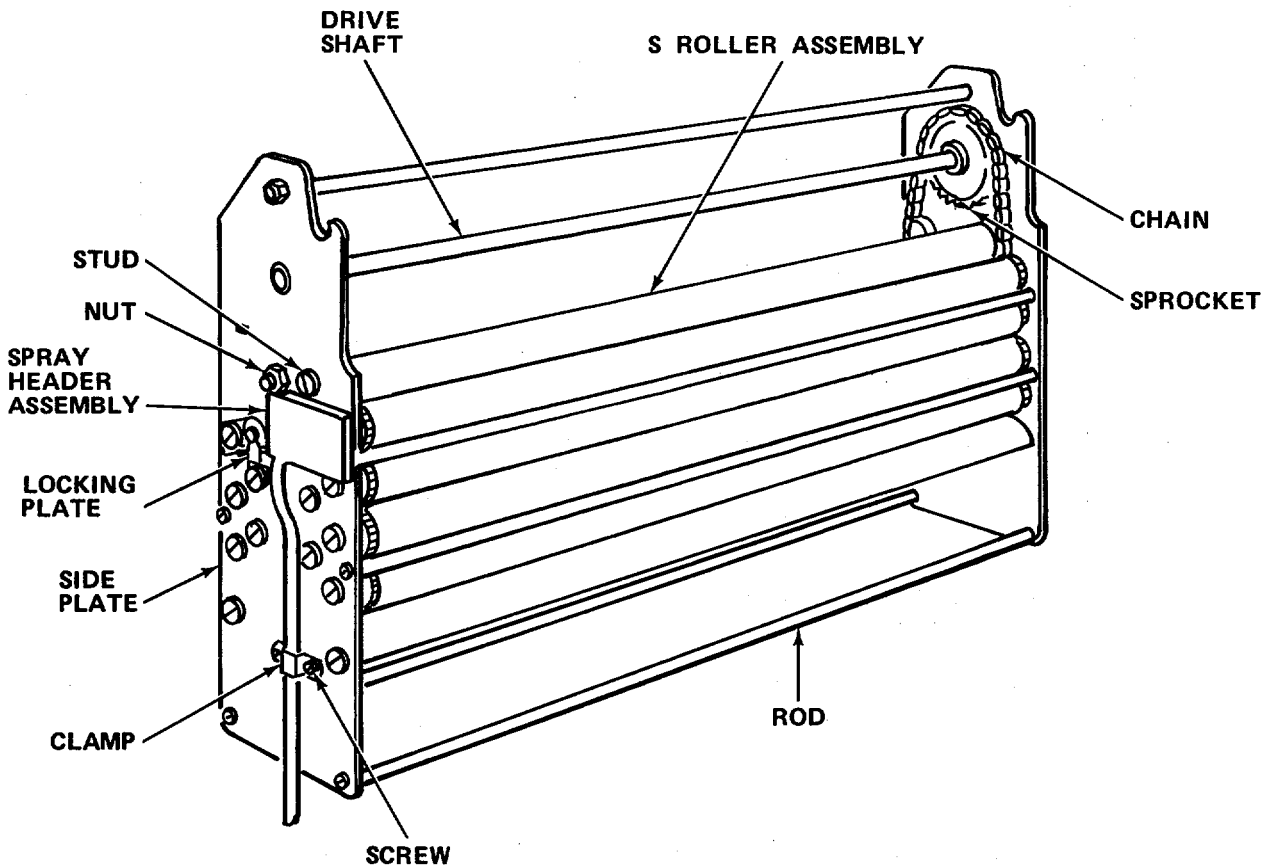
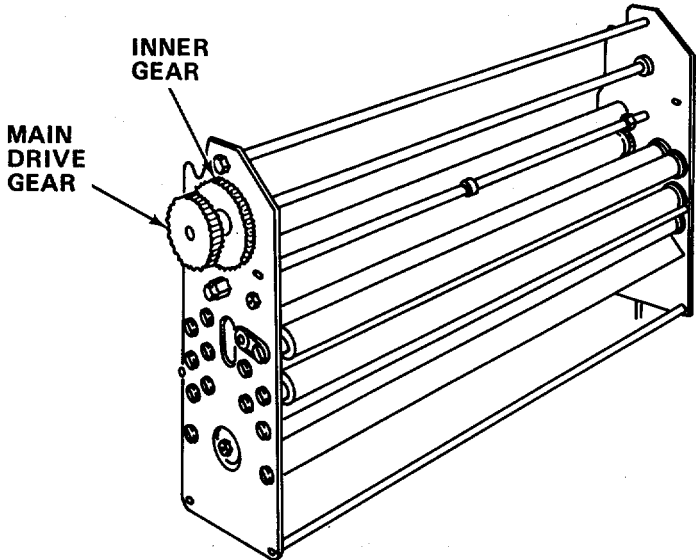
Always use splash guard when removing fixer rack to prevent contamination of developer tank.

NOTE

The following procedure is in disassembly/assembly sequence. Disassemble the fixer or wash rack assembly only as far as necessary to perform the repair.

- a. Remove fixer or wash rack assembly from processor.

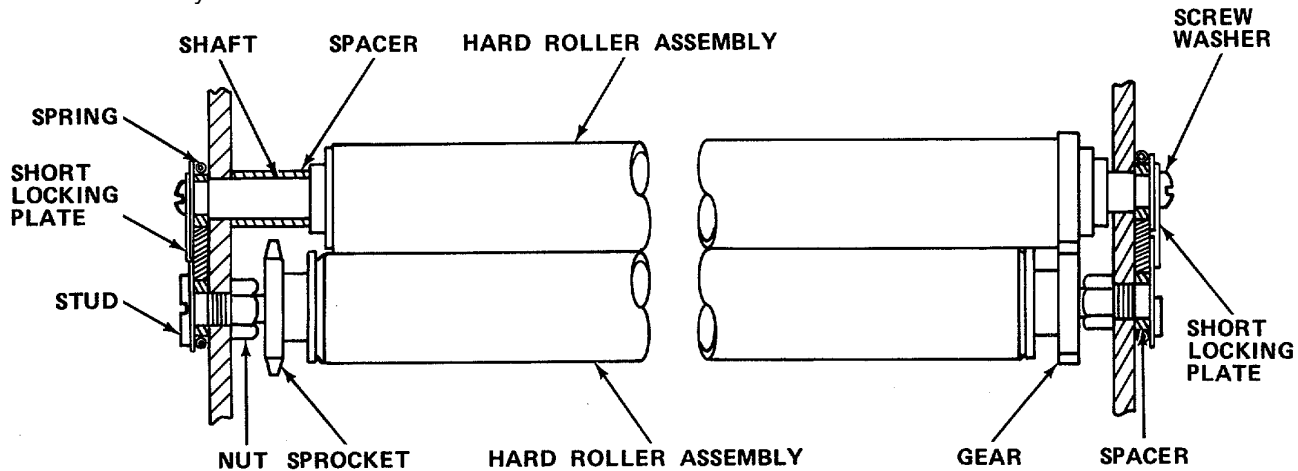




- b. Loosen setscrew and remove main drive gear from main drive shaft.
- c. Loosen setscrew and remove inner gear from shaft. Remove key from shaft.
- d. Loosen setscrews on collars on main drive shaft.
- e. Remove studs and chain idlers from left end plate.
- f. Remove main drive shaft, collars, chain sprocket, key, and washers from rack.

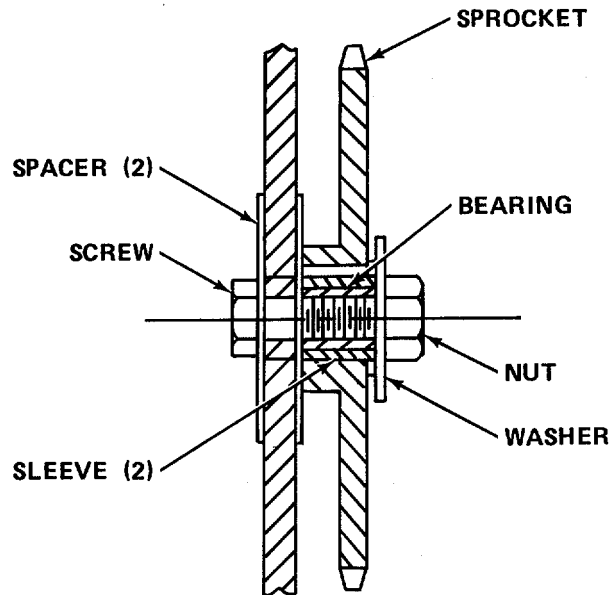
NOTE

Keep all components of each roller assembly together. Tag each roller assembly to be sure of proper reassembly.



- g. Remove screws, washers, locking plates, and springs from end of exit roller assembly.
- h. Remove shaft from exit roller assembly.
- i. Remove exit roller assembly, spacer, and bearings from between end plates.
- j. Loosen nuts and remove studs retaining resilient roller assembly to end plates. Tag and remove roller assembly.
- k. Locate defective roller and pry out roller stud from right end plate opposite chain end.
- l. Remove roller assembly.
- m. Remove roller stud from left end plate, if defective.
- n. Pry chain link apart and remove chain.

- o. Inspect all components for excessive wear or damage. Replace any defective components.
- p. Wash all components in warm, soapy water. Rinse well, and dry components thoroughly.
- q. Install drive chain to left end plate sprockets. Close link.
- r. Install roller stud to left end plate.
- s. Reinstall roller assemblies to their proper positions and retain with studs.
- t. Reinstall resilient roller assembly and retain with studs and nuts.
- u. Reinstall exit roller assembly, bearings and spacer. Insert shaft onto roller and retain with locking plates, springs, screws, and washers.



- v. Reinstall washers, key, chain sprocket, collars, and drive shaft to end plates.
- w. Reinstall chain idlers and studs to left end plate.
- x. Adjust adjustable chain idler until chain is tight.
- y. Position main drive shaft collars against bearing in right end plate and sprocket. Tighten setscrews.
- z. Reinstall key, and inner gear to drive shaft. Tighten setscrew.
- aa. Reinstall main drive gear to main drive shaft.
- ab. Reinstall rack into processor.

5-20.7 Replace Recirculation Tank.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Four persons are required to perform this procedure.

TOOLS:

Tool Kit, Light Machine Repair

Cross Tip Screwdriver

Flat Tip Screwdriver

Combination Wrench Set

12 in. Adjustable Wrench

1/2 in. Drive Socket Set

Drill

Drill Bits

Rivet Gun

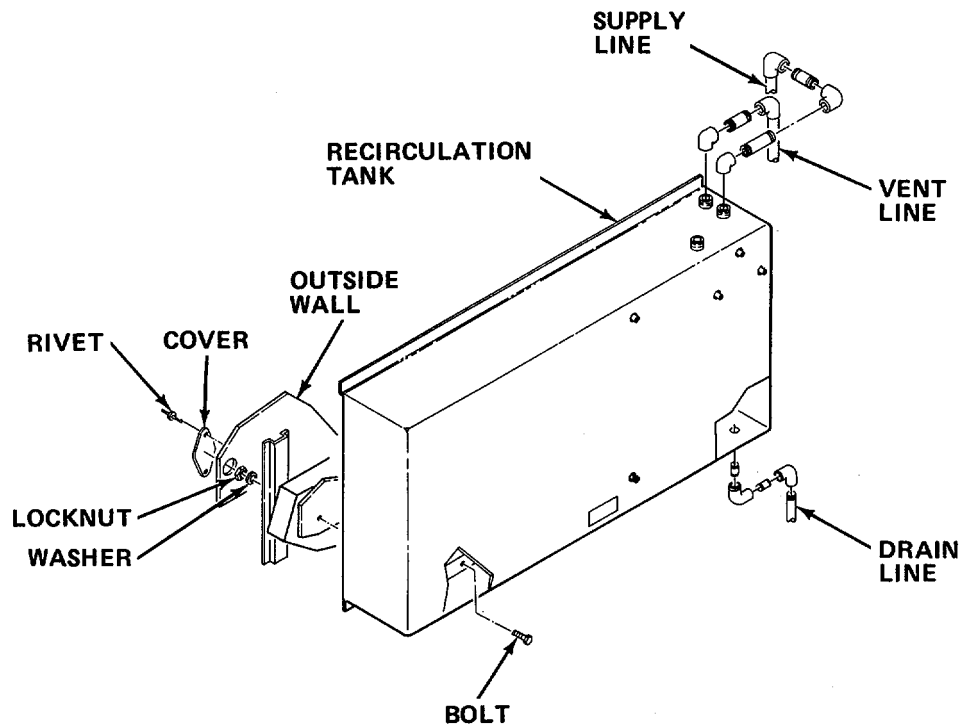
14 in. Pipe Wrench

SUPPLIES: Recirculation Tank
Teflon Tape (Item 66, Appendix E)
Silicone Sealant (Item 51, Appendix E)
1/4 in. Rivets

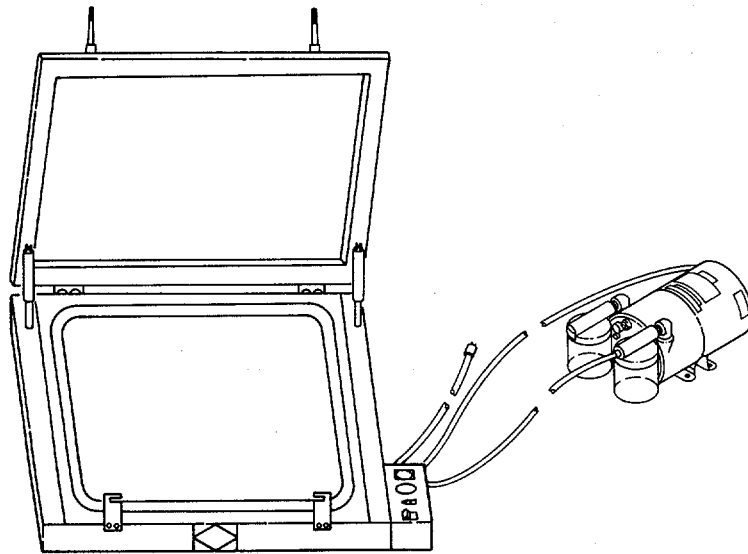
WARNING

Death or serious injury may occur from electrical shock unless heating element circuit breaker, CB7 is turned off before servicing.

- a. Turn off heating element circuit breaker (CB7) and HEATER switch.
- b. Drain water from recirculation tank.
- c. Remove thermostat and sensing bulb from tank (paragraph 5-16.21).
- d. Remove heating element from tank (paragraph 5-16.20).
- e. Remove sight gage.
- f. Remove plumbing and fittings from tank.



- g. Drill out rivets and remove cover plates from outer van wall.
- h. Support tank with a suitable lifting device.
- i. Remove nuts, washers, and bolts retaining tank to wall. Remove tank.
- j. Replace tank and retain with bolts, washers, and nuts.
- k. Apply silicone sealant to outer edge of cover plate.
- l. Reinstall cover plates and retain with new rivets.
- m. Apply teflon tape to threads of tank fittings. Reinstall fittings.
- n. Reinstall all plumbing lines.
- o. Apply teflon tape to threads of sight gage. Reinstall sight gage.
- p. Reinstall heating element (paragraph 5-16.20).
- q. Reinstall thermostat and sensing bulb (paragraph 5-16.21).
- r. Refill recirculation tank with fresh water.
- s. Check tank and fittings for leaks.
- t. Turn on circuit breaker (CB7) and HEATER switch.

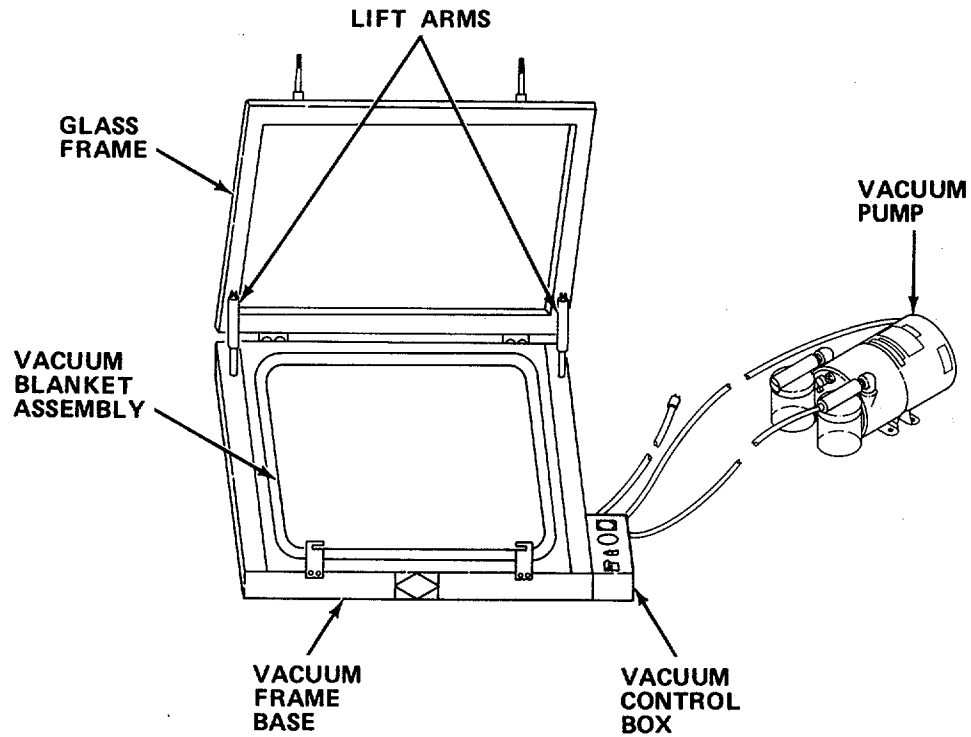


CHAPTER 6**CONTACT VACUUM FRAME****Section I. INTRODUCTION****6-1. GENERAL INFORMATION.**6-1.1 Scope.

- a. Model Number and Equipment Name. Model VFC32 Contact Vacuum Frame.
- b. Purpose of Equipment. To produce contact and duplicate prints, and to expose proofs. Also used to mount photographs, posters, prints, graphs, and maps.

6-2. EQUIPMENT DESCRIPTION.6-2.1 Equipment Characteristics, Capabilities, and Features.

- a. Counterbalanced glass frame.
- b. One-piece, molded live rubber blanket.
- c. Welded steel base with aluminum glass frame.
- d. Vacuum system consisting of gage, integral vacuum pump and motor, and control box.

6-2.2 Location and Description of Major Components.

VACUUM FRAME BASE. Welded steel frame provides smooth surface for mounting vacuum blanket.

VACUUM BLANKET ASSEMBLY. One-piece, molded live rubber blanket with ports for creating vacuum under glass frame. Also has molded rubber edging to provide sealed area when glass frame is lowered.

GLASS FRAME. An aluminum frame used to house glass plate.

LIFT ARMS. Two gas springs used to aid in raising the glass frame.

VACUUM CONTROL BOX. Contains on/off controls for vacuum pump, a bleed valve, and a vacuum gage.

VACUUM PUMP. Oil-less vacuum pump made of cast iron with hard carbon vanes.

6-2.3 Equipment Data.

Power Requirements

Vacuum Pump 115 V, 60 Hz, 4.2 Amps

Pump Motor

Power Output 1/6 hp

Speed 1725 rpm

Ambient Temperature 105OF (40°C)

Contact Vacuum Frame Dimensions (Inside)

Height 5.0 in. (12.6 cm)

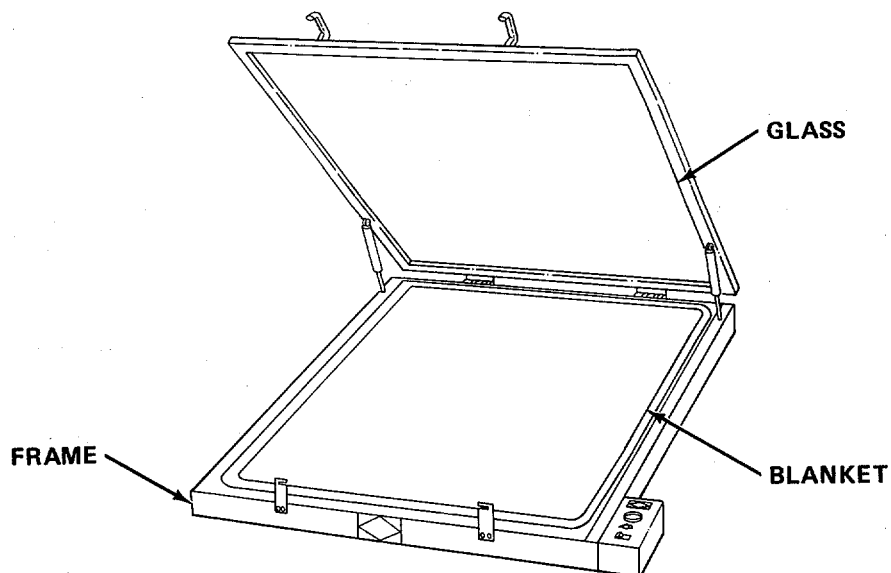
Length 28.0 in. (72.0 cm)

Width 32.0 in. (82.0 cm)

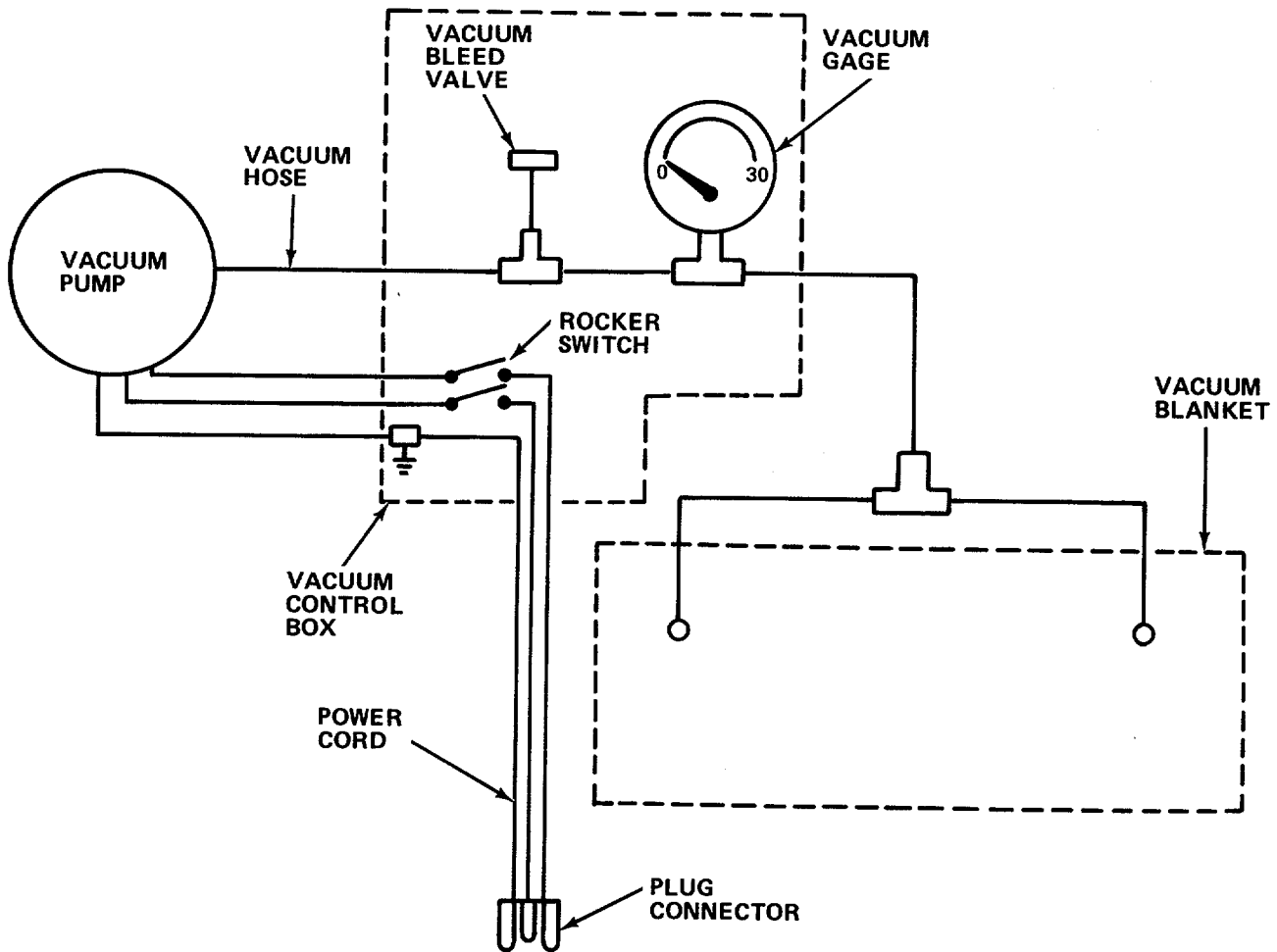
6-3. TECHNICAL PRINCIPLES OF OPERATION . The contact vacuum frame consists of two major subassemblies:

Vacuum Frame

Vacuum Pump System



6-3.1 Vacuum Frame. Provides a sturdy frame for constant use. The blanket is pliable to aid in providing tight contact for the material being processed. Raised rubber edges around the vacuum blanket provide an airtight seal between the glass and blanket.



6-3.2 Vacuum Pump System. Produces the vacuum required for the vacuum frame. It is composed of the following components:

a. Vacuum pump. Vacuum pump is a single pump and motor. The outer end plate, body, rotor and mounting bracket are all cast iron. The vanes are made of hard carbon and are precision ground. The motor is thermally protected and will automatically restart when protector resets.

b. On-Off Rocker Switch. A double-pole, single-throw switch, used to apply both the positive and negative power leads to the vacuum pump.

c. Vacuum Gage. Used to indicate the amount of vacuum created in the vacuum frame. Indicates from 0-30 lbs. of pressure.

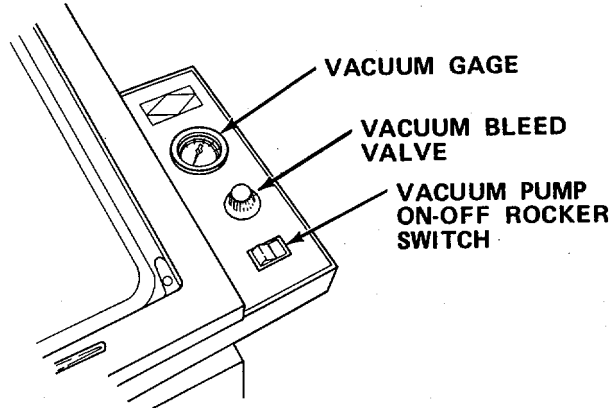
d. Vacuum Bleed Valve. Used to bleed vacuum from the vacuum frame. Valve is a needle type valve. Rotating knob to the left will open valve, to the right will close valve. Can be used to control vacuum pressure.

Section II. OPERATING INSTRUCTIONS

6-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.

CONTROL OR INDICATOR

FUNCTION



Vacuum Pump On-Off Rocker Switch

Applies power to the vacuum pump.

Vacuum Bleed Valve

Used to relieve or adjust the vacuum pressure.

Vacuum Gage

Indicates vacuum pressure in the vacuum frame. Scaled from 0-30 lbs.

6-5. 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.

6-5.1 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 column. 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:

<u>Item</u>	<u>Quantity</u>
Glass Cleaner (Item 11, Appendix E)	ar
Cheesecloth (Item 14, Appendix E)	ar

Table 6-1. 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

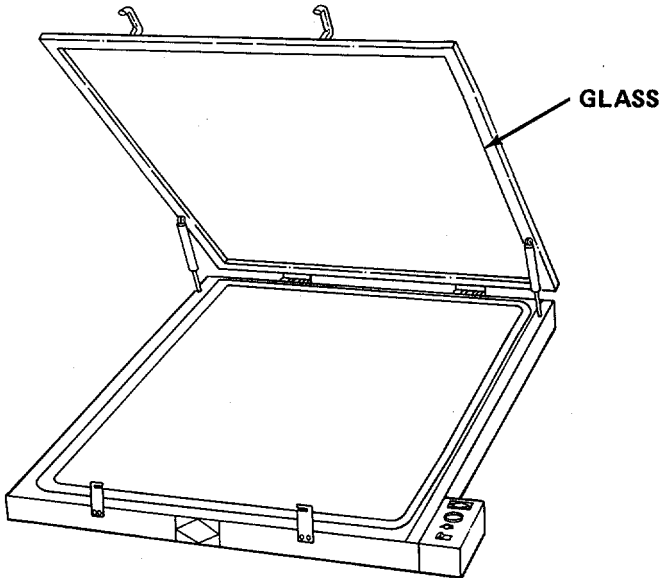
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
1	B	<p><u>CONTACT VACUUM FRAME</u></p> <p><u>Clean Glass.</u></p>  <ol style="list-style-type: none"> 1. Use cheesecloth moistened with glass cleaner to clean top of glass surface. 2. Raise glass frame. 3. Use cheesecloth moistened with glass cleaner to clean underside of glass surface. 	

Table 6-1. OPERATOR 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	For Readiness Reporting Equipment Is Not Ready/ Available If:
2	B/D	<p><u>CONTACT VACUUM FRAME - Cont</u></p> <p><u>Inspect Contact Vacuum Frame.</u></p> <p style="text-align: center;"><u>WARNING</u></p> <p>Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.</p> <ol style="list-style-type: none"> 1. Unplug power cord for vacuum pump control box. 2. Inspect power cord going to control box for broken wires, frayed insulation, or damaged plug. 3. Inspect power cord going to vacuum pump for broken wires or frayed insulation. 4. Visually inspect all vacuum hoses for tight connections, and for cracks or breaks. 5. Inspect vacuum blanket for rips or tears. 	<p>Plug damaged, frayed insulation or broken wires.</p> <p>Broken wires or frayed insulation.</p> <p>Hoses cracked or broken.</p> <p>Blanket ripped or torn.</p>

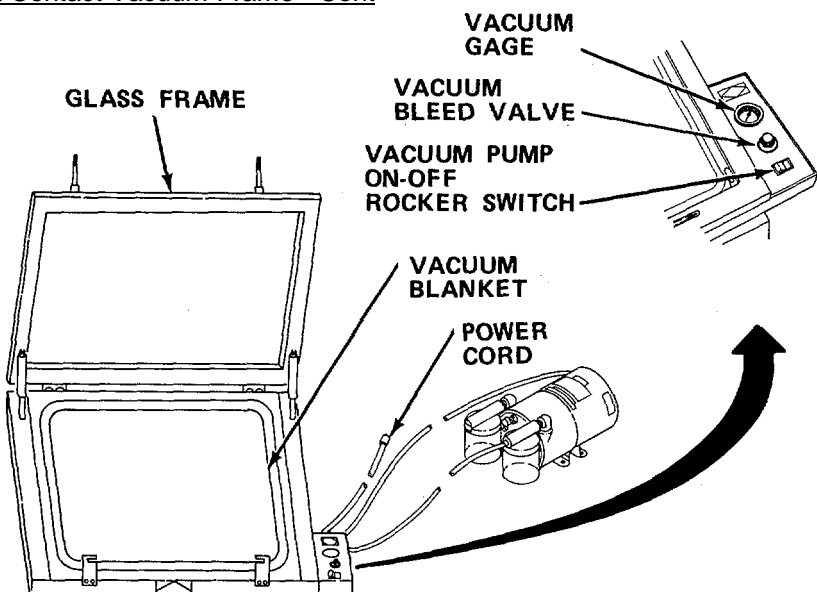
Table 6-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

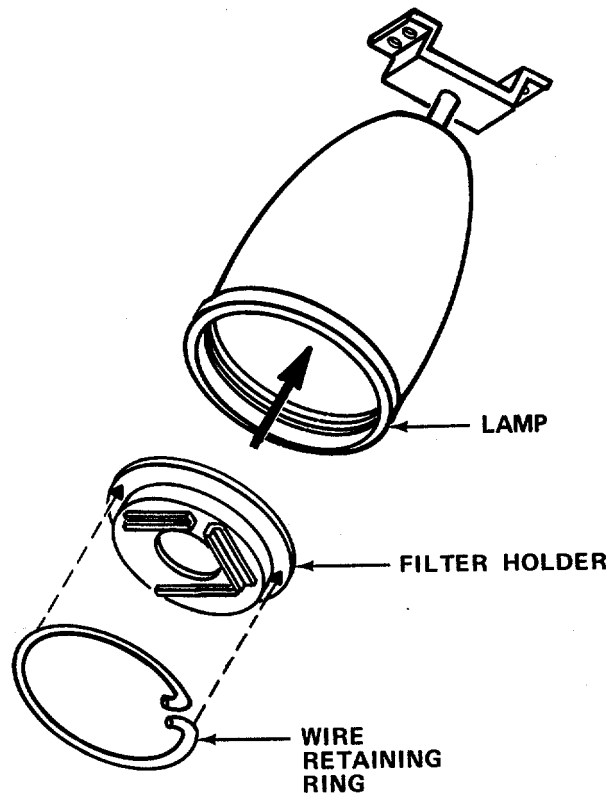
AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
2	B/D	<p><u>CONTACT VACUUM FRAME - Cont</u></p> <p><u>Inspect Contact Vacuum Frame - Cont</u></p>  <ol style="list-style-type: none"> 6. Plug in vacuum pump control box power cord. 7. Close glass frame and lock into place. 8. Turn vacuum pump on-off rocker switch on. 9. Verify bleed valve is closed. 10. Verify vacuum is created in vacuum frame by observing vacuum gage. 11. Verify vacuum builds up to 25 lbs. 12. Open vacuum bleed valve and verify that vacuum decreases. 13. Turn off vacuum pump rocker switch. 	<p>Vacuum pump does not turn on.</p> <p>Vacuum is not created.</p> <p>Vacuum will not build up to 25 lbs.</p> <p>Vacuum does not decrease.</p>

6-6. OPERATION UNDER USUAL CONDITIONS.

6-6.1 Assembly and Preparation for Use.



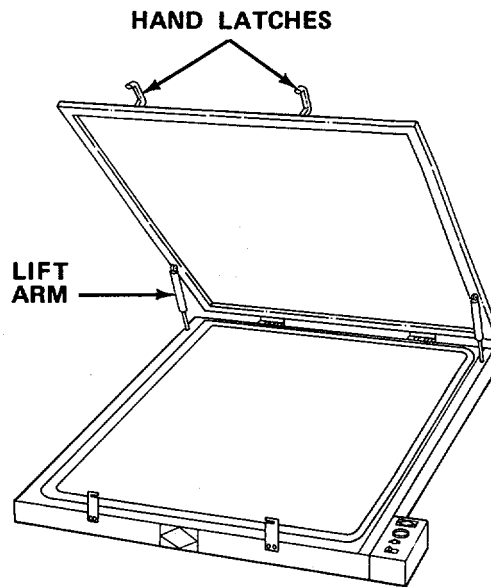
- Insert filter holder into bottom of contact printing lamp.
- Squeeze wire retaining ring and insert it on top of filter holder.
- Release wire retaining ring so ring locks filter holder in place.
- Perform before operation (B) PMCS (Table 6-1 and Table 10-1).
- Plug in power cords for vacuum pump control box and timer/power supply control box.

6-6.2 Operating Procedures.

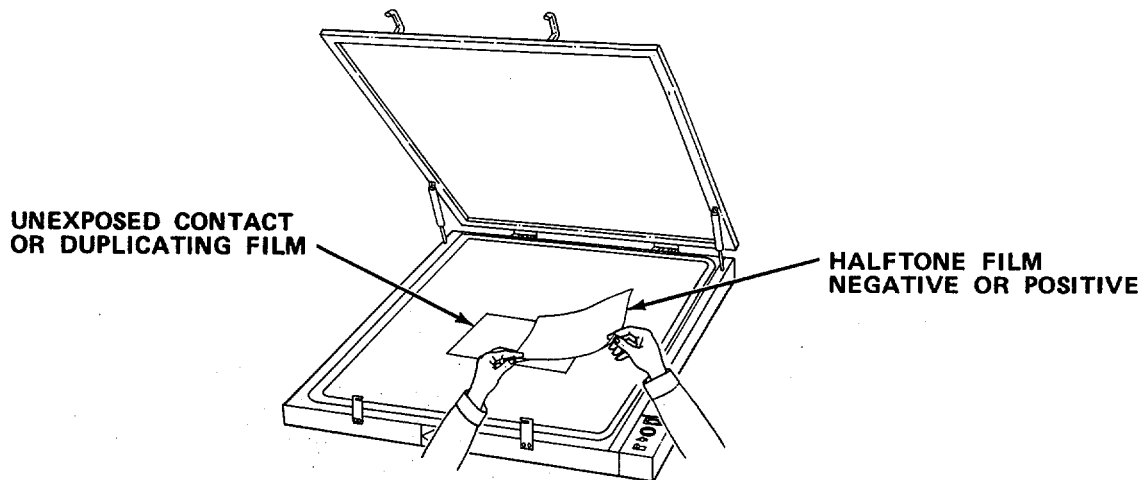
- Preliminary procedures for making a contact positive/duplicate negative.

NOTE

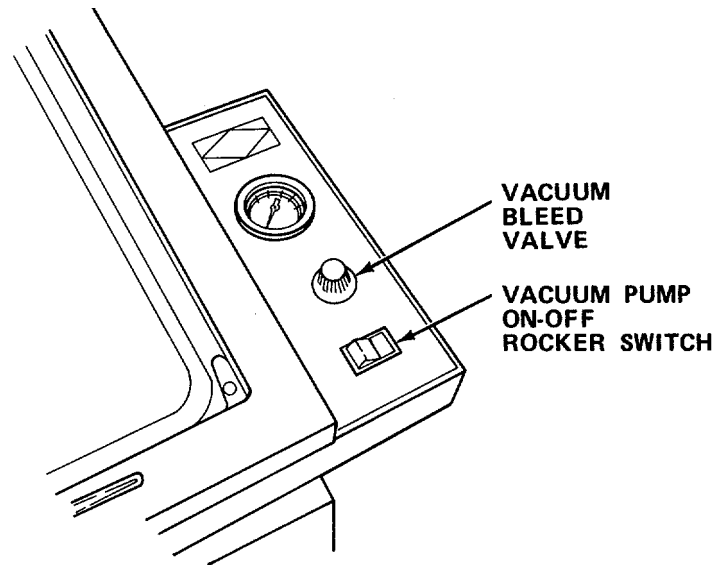
- The following steps are performed to make a contact step-off exposure test to determine the settings for the contact printing lamp.
- The following procedures require the use of a darkroom environment.



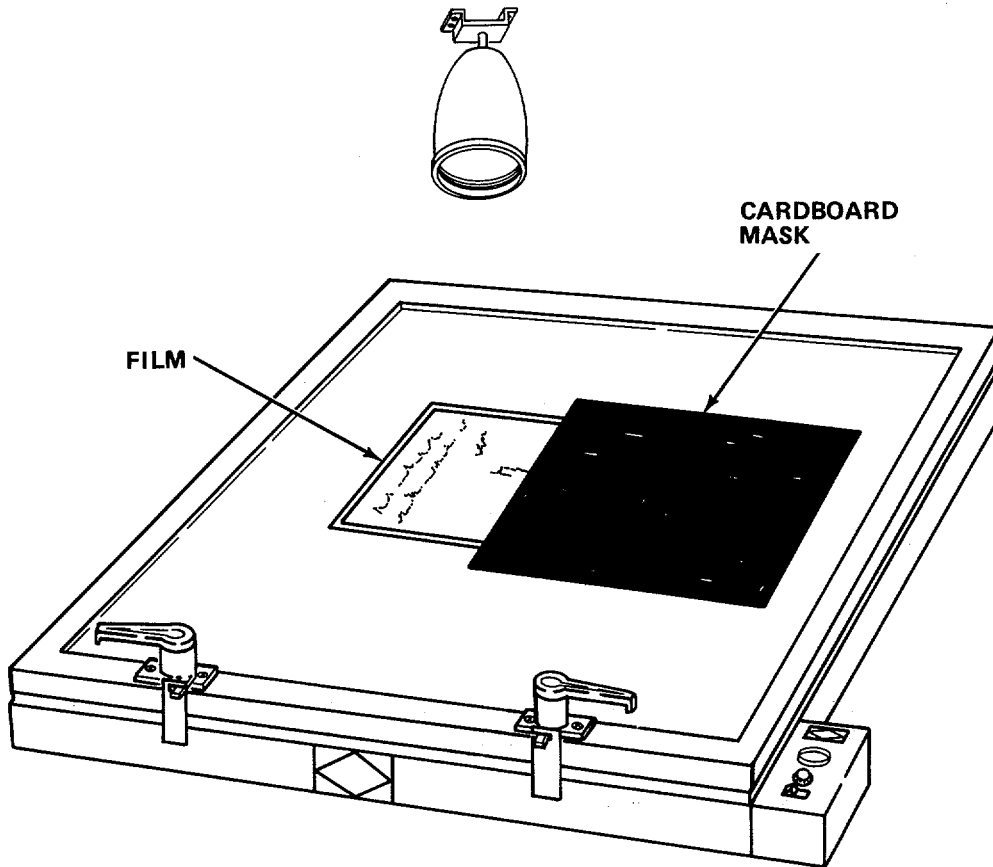
- (1) Unlock the left-and right-hand latches and lift the glass frame until the two lift arms take hold and open the frame completely.
- (2) Place a sheet of unexposed contact or duplicating film on the vacuum blanket, emulsion side up.



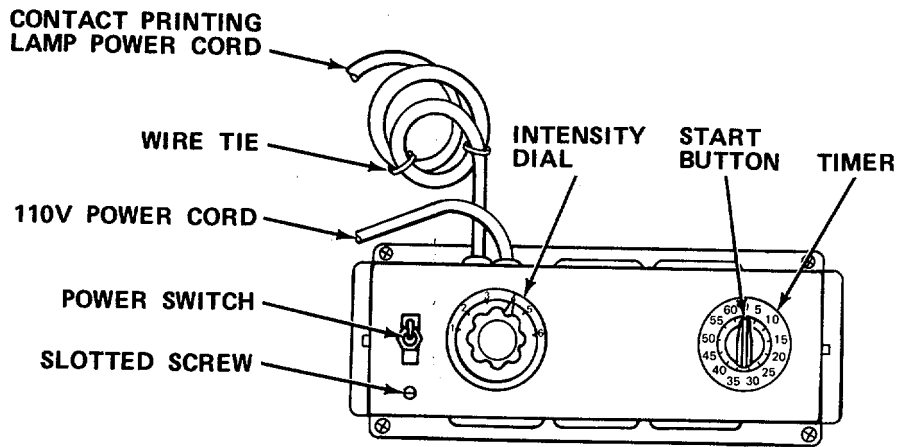
- (3) Cover the film with a halftone film negative or positive, emulsion side down. Be sure alinement of materials is correct.
- (4) Lower glass frame and lock the left-and right-hand latches into place.



- (5) Turn on vacuum pump and check that bleed valve is closed.
- (6) Cut out a piece of cardboard large enough to cover the film in the contact vacuum frame.



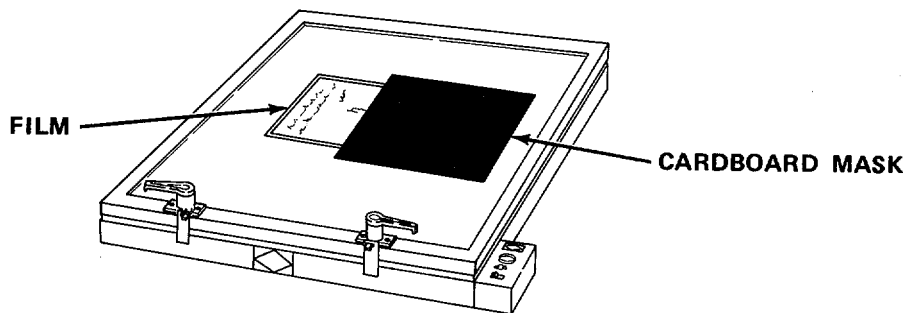
- (7) Cover 3/4 of the film with the cardboard.



- (8) Set intensity dial to 3.
- (9) Set time to 40 seconds.
- (10) Turn on power switch for timer/power supply control box.

NOTE

- When full vacuum is reached (approximately 25 lbs) on the vacuum gage, you are ready to make exposures.
 - Be ready to move the cardboard mask quickly as you watch the timer.
- (11) Press the start button to activate the timer.



- (12) At 30 seconds, quickly move the mask to uncover another 1/4 of the film (1/2 is now showing).

- (13) At 20 seconds, move the mask to uncover another 1/4 of the film (3/4 is now showing).
- (14) At 10 seconds, remove the mask altogether.
- (15) When the exposing lamp goes out, turn off vacuum pump rocker switch.
- (16) Turn off power switch for timer/power supply control box.
- (17) Open bleed valve to bleed vacuum off vacuum frame.
- (18) Unlock the left-and right-hand latches and lift the glass frame until the two lift arms take hold and open the frame completely.
- (19) Remove exposed contact or duplicating film and process.



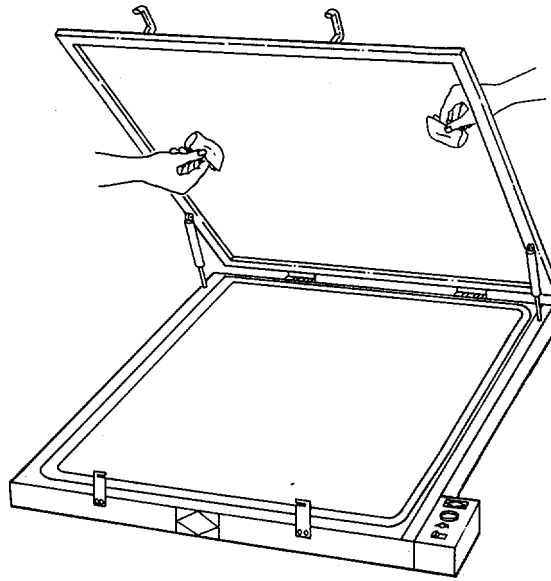
- (20) Compare the processed step-off film with the original negative or positive.

NOTE

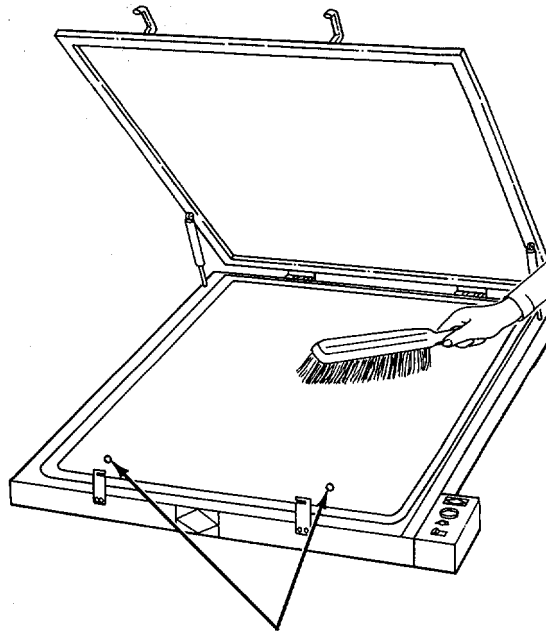
One of the steps will match the original film closer than any other step. This step may be exactly right, or you may have to do a second step-off test with shorter intervals of time, and/or different intensity settings to find the right exposure.

- (21) Repeat steps (1) through (20) until correct exposure controls are obtained.
- (22) Once you have found the right exposure by step-off, strip a contact control guide onto the edge of the test halftone, and make a final contact or duplicate at the new exposure time (steps (1) through (19)).

b. Making a contact positive/duplicate negative.



(1) Clean the contact vacuum frame glass on both sides.

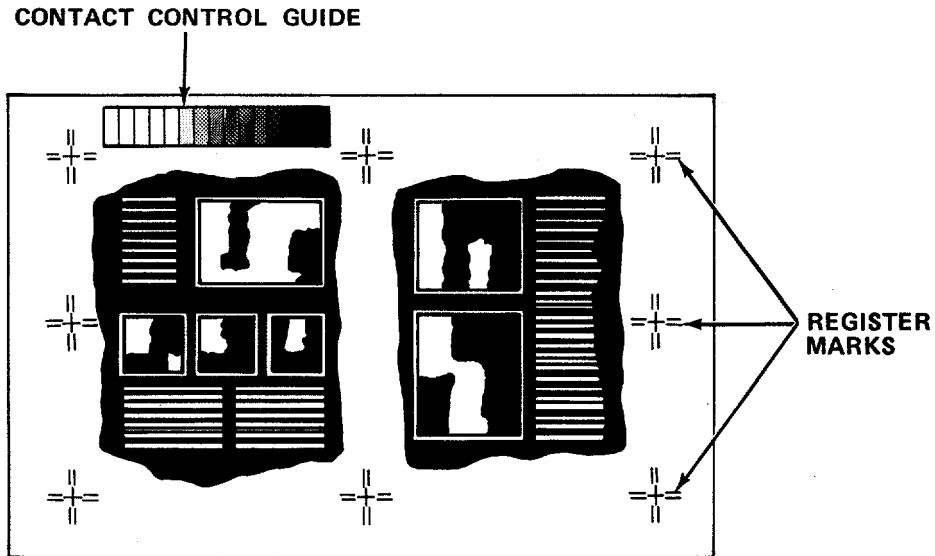


VACUUM EXHAUST HOLES

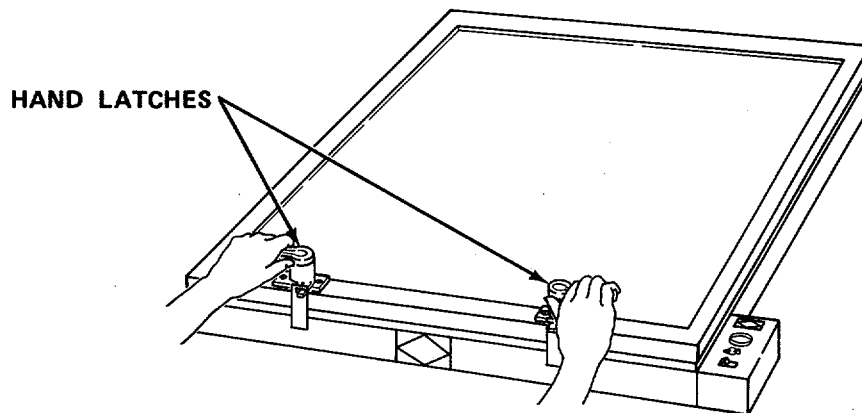
(2) Make sure that the vacuum blanket is clean and that the vacuum exhaust holes remain uncovered.

NOTE

- If additional flats are to be exposed on the same film being contacted, or if the film being contacted is to be used for multiple color printing, register marks should be inserted in the flats or some sort of register system should be used to register the job. Register marks are placed so they expose on the film being contacted outside the image area. They can be trimmed off after the job is printed.
- The contact control guide is designed to overcome the problem of incorrect exposure. The guide is stripped into the edge of the film flat in a non-printing area, usually the outer edge.



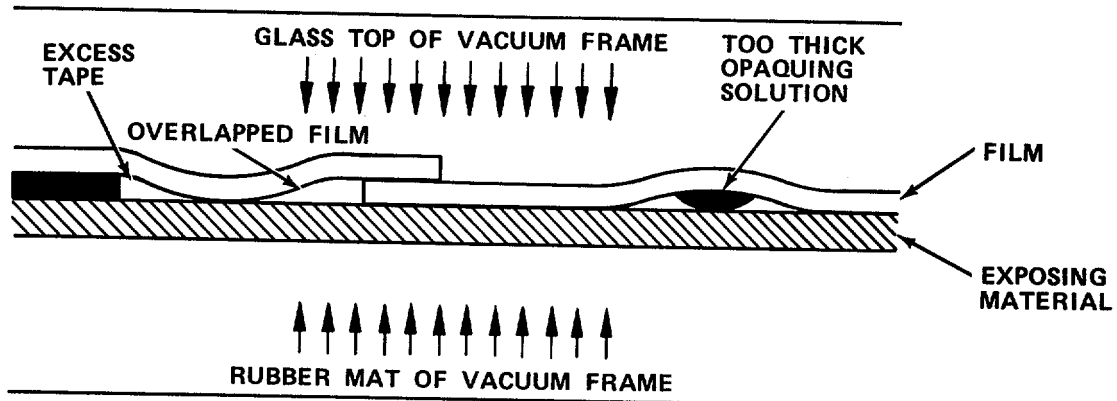
- (3) Strip a contact control guide into the edge of the film flat that you will be contacting.



- (4) Unlock the left-and right-hand latches and lift the glass frame until the two lift arms take hold and open the frame completely.

NOTE

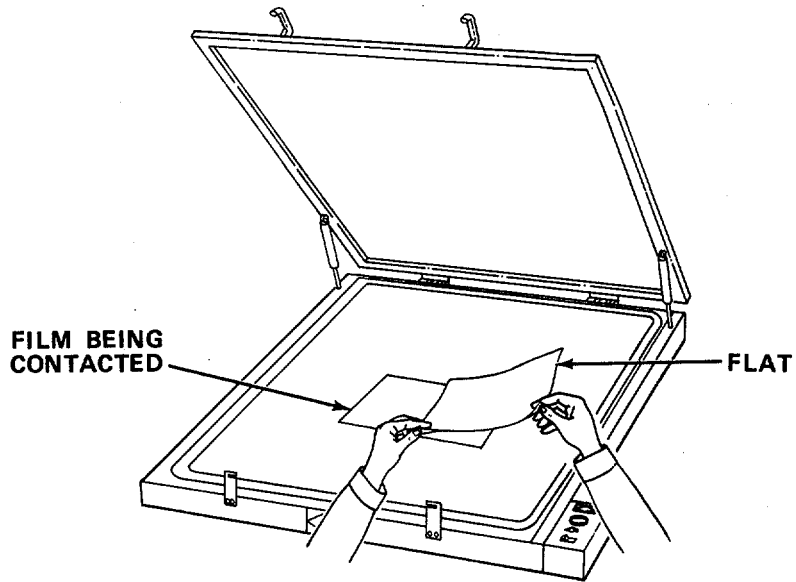
- Standard masking materials should always be used in making the flat. These materials will prevent the exposing light going through to the film being contacted. In the stripping procedure on the light table however, film can be read through the masking sheet. The film contained in the flat should be free of pinholes, dust, dirt, and tape adhesive residue.
- Since the film being contacted must pick up fine detail such as fine halftone dots, the film will also reproduce pinholes, opaquing, and dust specks on the image area. Pinholes should be covered with opaquing solutions prepared for this purpose. Film should be cleaned with film cleaner or an anti-static brush.



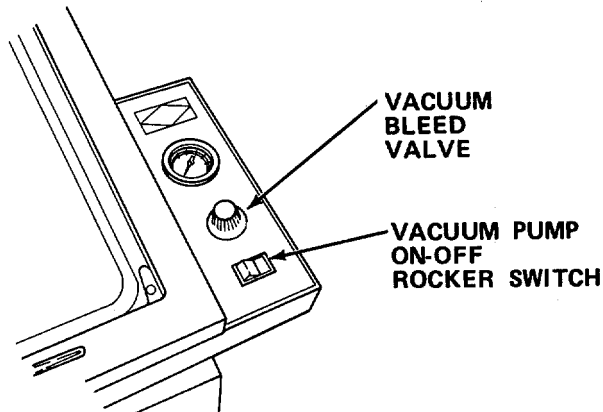
- Poor contact with film will result if excess tape is used, or if pieces of film are overlapped. Opaquing solutions for covering pin holes should be properly thinned. A solution that is too thick may prevent perfect contact.
 - Handle flats carefully to avoid kinks and creases that will result in poor contact points. Lift flats by opposite corners to help prevent kinking and scratching.
 - Avoid fingerprints on film.
 - Handle film only under lights recommended by the manufacturer.
- (5) Set up the area in a darkroom environment.
 - (6) Place a sheet of unexposed contact or duplicating film on the vacuum blanket, emulsion side up.

NOTE

For some job specifications, both emulsions will face the same direction.



- (7) Place the flat on top of the film being contacted. The emulsion of the flat should face the emulsion of the contact or duplicating film. Be sure materials are correctly aligned.
- (8) Lower glass frame and lock the left- and right-hand latches into place.

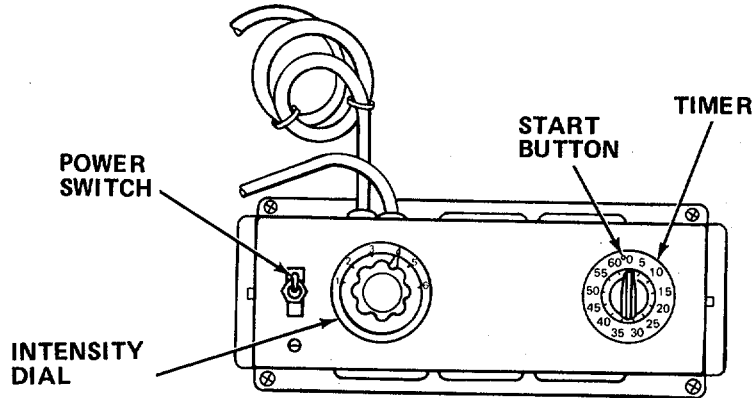


- (9) Turn on vacuum pump and check that bleed valve is closed.

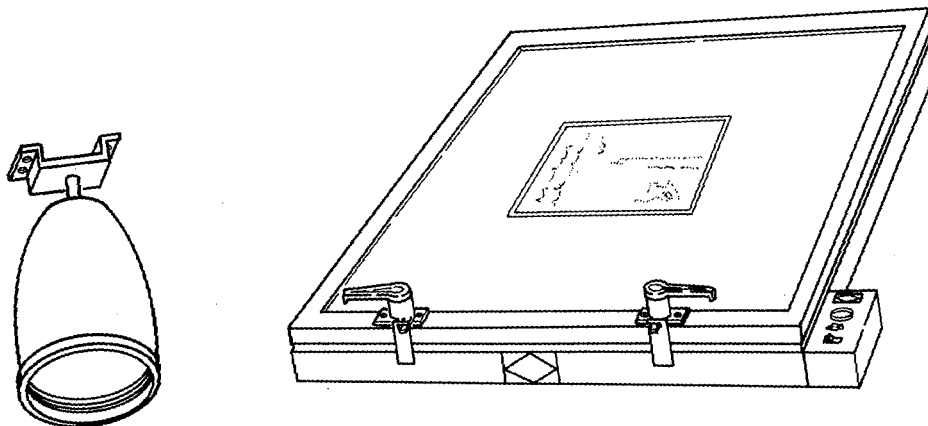
NOTE

Watch the effect of the vacuum on the film. If air pockets form, release the vacuum (by opening the bleed valve), and start again.

- (10) Wait for the vacuum frame to reach full vacuum, approximately 25 lbs.



- (11) Set intensity dial and timer to exposure settings determined by step-off exposure test (paragraph 6-6.2a).
- (12) Turn on power switch for timer/power supply control box.
- (13) Press the start button to activate the timer.



- (14) When the exposing lamp goes out, turn off vacuum pump rocker switch.
- (15) Turn off power switch for timer/power supply control box.

- (16) Open bleed valve to bleed vacuum off vacuum frame.
- (17) Unlock the left-and right-hand latches and lift the glass frame until the two lift arms take hold and open the frame completely.
- (18) Carefully remove and separate the two films. Store the original film in a safe place.
- (19) Process the newly exposed film.

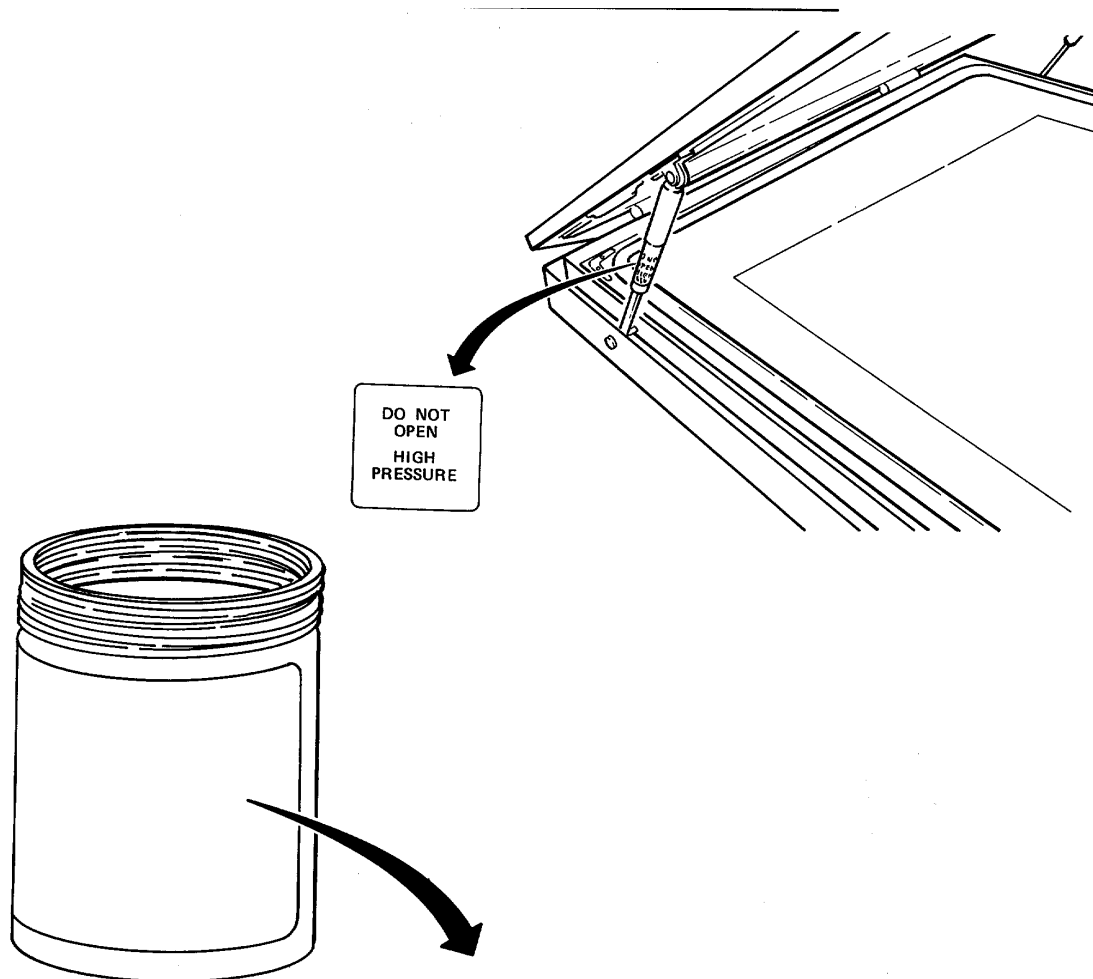


- (20) Check the results. Use a magnifier on highlight, middletone, and shadow dots in checking accuracy of the image. The contact control guide provides several visual targets for checking exposure accuracy.

6-6.3 Preparation for Movement.

- a. Unplug power cords for vacuum pump control box and timer/power supply control box.
- b. Be sure that glass frame is locked in place.
- c. Remove filter holder and wire retaining ring from contact printing lamp, and store in designated cabinet.

6-6.4 Operating Instructions on Decals and Instruction Plates.



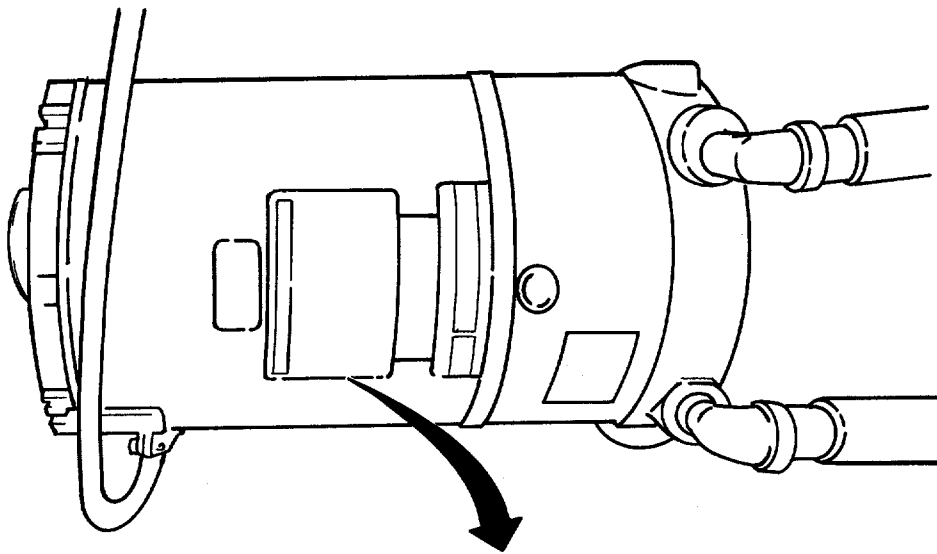
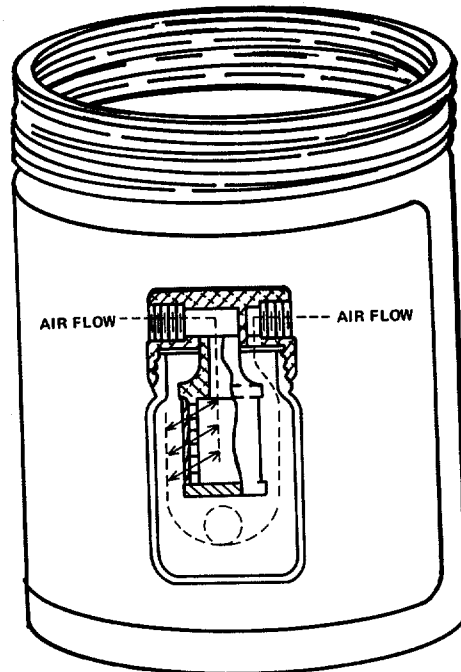
WHEN INSTALLED - AS INTAKE FILTER:
 INCOMING AIR MUST ENTER JAR FIRST.

AS EXHAUST MUFFLER:
ON LUBRICATED PUMP: AIR MUST PASS THRU FILTERING ELEMENT FIRST BEFORE ENTERING JAR FOR BEST SILENCING AND SEPARATION OF OIL VAPOR. EMPTY OIL AND/OR MOISTURE BEFORE THE LIQUID LEVEL REACHES FELT.

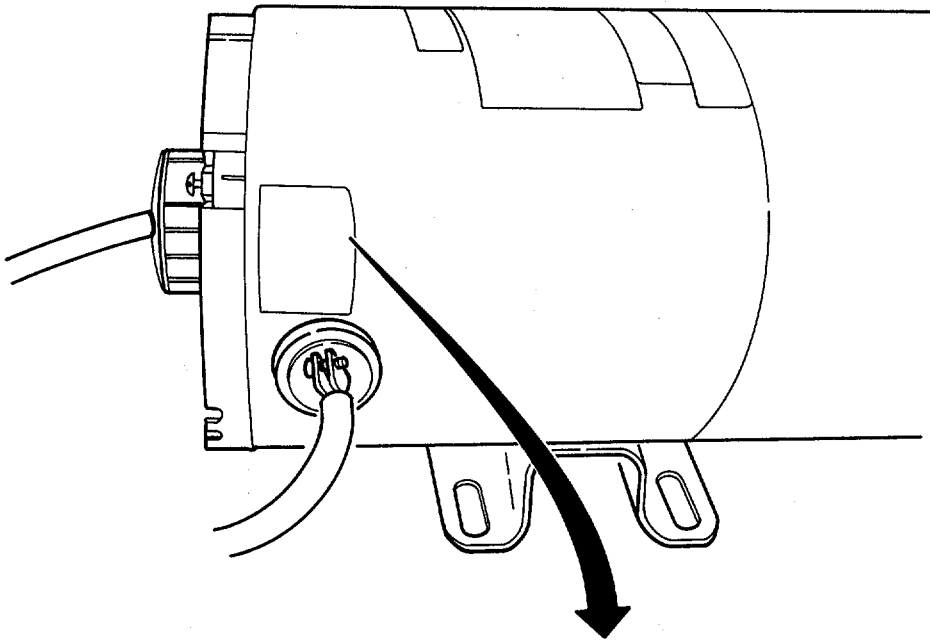
ON OIL - LESS PUMP: AIR MUST ENTER JAR FIRST FOR BEST COLLECTION OF GRAPHITE DUST FROM CARBON VANES.

CAUTION: GLASS JAR COULD EXPLODE IF SUBJECTED TO MORE THAN 5 P.S.I.G./35 bar (METAL JAR SAFE TO 30 P.S.I.G./2 bar)

IMPORTANT: CLEAN FELTS EVERY 100 HOURS. REPLACE FELTS TWICE A YEAR



CAUTION
NEVER LUBRICATE THIS OIL - LESS PUMP FLUSHING WHILE RUNNING PUMP, SLOWLY FEED 1 TO 2 OZ. OF LOCTITE SAFETY SOLVENT, DOW CHEMICAL SOLVENT OR EQUIV. SOLVENTS WITH A TOXICITY RATING OF 500PPM OR GREATER INTO INLET. DO NOT INHALE FUMES, FLUSH IN OPEN AREA AWAY FROM OPEN FLAME. DO NOT USE A PETROLEUM BASE SOLVENT



CAUTION

**NEVER LUBRICATE THIS OIL - LESS PUMP
FLUSHING WHILE RUNNING PUMP,
SLOWLY FEED 1 TO 2 OZ. OF LOCTITE
SAFETY SOLVENT, DOW CHEMICAL SOLVENT
OR EQUIV. SOLVENTS WITH A TOXICITY
RATING OF 500PPM OR GREATER INTO
INLET. DO NOT INHALE FUMES, FLUSH
IN OPEN AREA AWAY FROM OPEN FLAME.
DO NOT USE A PETROLEUM BASE SOLVENT**

6-7. OPERATION UNDER UNUSUAL CONDITIONS. This equipment is designed for operation only in a controlled environment.

Section III. OPERATOR'S MAINTENANCE INSTRUCTIONS

6-8. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

6-9. TROUBLESHOOTING PROCEDURES.

- a. The table lists the common malfunctions which you may find during the operation or maintenance of the contact vacuum frame, 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 6-2. TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

1. VACUUM PUMP DOES NOT TURN ON.

Step 1. Check that power cord is plugged into outlet.

- (a) If cord is plugged in, proceed to step 2.
- (b) Plug in power cord.

Step 2. Check to see if outlet circuit breaker is tripped.

- (a) If circuit breaker is on, refer to organizational maintenance.
- (b) Reset circuit breaker.

2. HALATION OCCURS; APPEARS AS DOT SPREADING; COPY ENLARGED AT EDGES; SHADOWS ON TYPE.

Step 1. Check for overexposure which may accent poorly stripped areas.

- (a) If exposure correct, proceed to step 2.
- (b) Adjust for proper exposure.

Step 2. Check for yellowed or defective sensitivity/contact control guide.

- (a) If guide is not defective, proceed to step 3.
- (b) Replace sensitivity/contact control guide.

Step 3. Check flat for proper stripping.

- (a) If flat properly prepared, proceed to step 4.
- (b) Have flat properly stripped.

Step 4. Check vacuum level used.

- (a) If vacuum correct, proceed to step 5.
- (b) Repeat procedure using proper vacuum.

Table 6-2. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. HALATION OCCURS; APPEARS AS DOT SPREADING; COPY ENLARGED AT EDGES; SHADOWS ON TYPE- Cont	Step 5. Check setting of intensity dial for contact printing lamp.	<ul style="list-style-type: none"> (a) If intensity dial setting correct, refer to operating procedures. (b) Readjust intensity setting.
3. BROKEN IMAGES.	Step 1. Check stripped flat for tape or opaquing solution covering portion of image that is broken.	<ul style="list-style-type: none"> (a) If stripped flat is correctly prepared, proceed to step 2. (b) Correctly prepare flat.
	Step 2. Check that glass frame is clean.	<ul style="list-style-type: none"> (a) If glass frame is clean, proceed to step 3. (b) Clean glass frame.
	Step 3. Check exposure with sensitivity/contact control guide.	<ul style="list-style-type: none"> (a) If exposure correct, problem may be due to flat being dirty. Clean flat. (b) Reset exposure controls.

6-10. MAINTENANCE PROCEDURES. There are no operator maintenance procedures assigned for this equipment.

Section IV. ORGANIZATIONAL MAINTENANCE

6-11. LUBRICATION INSTRUCTIONS . This equipment does not require lubrication

6-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT.

6-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

6-12.2 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.

6-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-3610-285-24P covering organizational maintenance for this equipment.

6-13. SERVICE UPON RECEIPT.

6-13.1 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.

6-14. 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 column. 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:

<u>Item</u>	<u>Quantity</u>
Combination Wrench Set	1
Nonflammable Flushing Solvent (Item 54, Appendix E)	ar
Vacuum Pump Filter	2

Table 6-3. 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

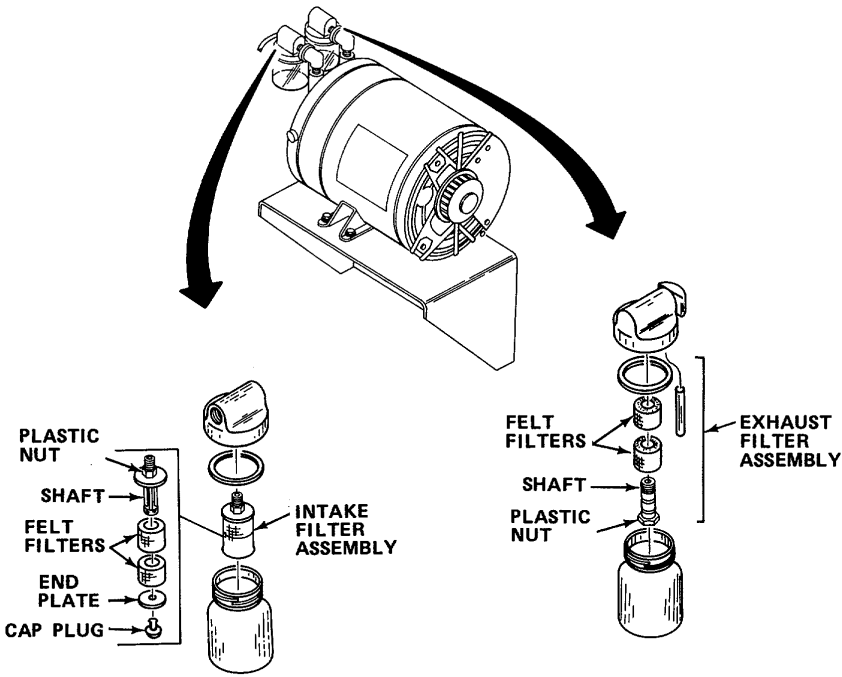
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
1	M	<p><u>CONTACT VACUUM FRAME SYSTEM</u></p> <p>Inspect and Service Vacuum Pump Filters.</p> <p style="text-align: center;">WARNING</p> <p>Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.</p> <p>1. Unplug power cord for vacuum control box.</p> 

Table 6-3. 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
1	M	<p>CONTACT VACUUM FRAME SYSTEM-Cont</p> <p><u>Inspect and Service Vacuum Pump Filters-Cont</u></p> <p>2. Remove intake and exhaust glass jars.</p> <p>3. Carefully remove intake filter assembly.</p> <p>4. Remove cap plug on bottom of filter assembly and remove two felt filters.</p> <p>5. Carefully remove exhaust filter assembly and two felt filters.</p> <p>6. Clean felt filters using nonflammable flushing solvent. Replace if necessary.</p> <p>7. Reinstall exhaust felt filters onto shaft and install shaft back onto vacuum pump. Use care not to overtighten plastic nut.</p> <p>8. Reinstall intake felt filters onto shaft, and then install endplate and cap plug.</p> <p>9. Reinstall filter assembly back onto vacuum pump. Use care not to overtighten plastic nut.</p> <p>10. Reinstall intake and exhaust glass jars.</p>

6-15. 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 is not corrected by a listed corrective action, notify your supervisor.
- c. If the vacuum pump 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 troubleshooting. Perform no-power procedures for dead receptacle (Table 1-4).

Table 6-4. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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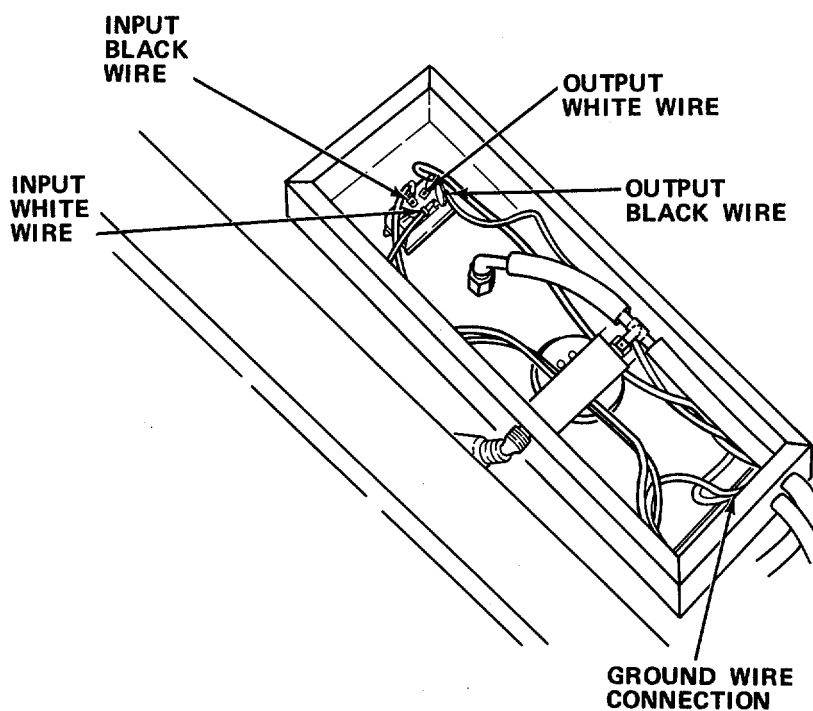
1. VACUUM PUMP DOES NOT TURN ON.

Step 1. Check continuity of power cord for vacuum control box as follows:

WARNING

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

- (a) Unplug power cord for vacuum control box.



- (b). Remove cover plate on underside of control box.
 (c). Check for zero ohm resistance between positive prong of power cord and input black wire of rocker switch.
 (d). Check for zero ohm resistance between negative prong of power cord and input white wire of rocker switch.

Table 6-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

1. VACUUM PUMP DOES NOT TURN ON-Cont

(e) Check for zero ohm resistance between ground prong of power cord and ground post in control box.

(1) If all checks correct, proceed to step 2.

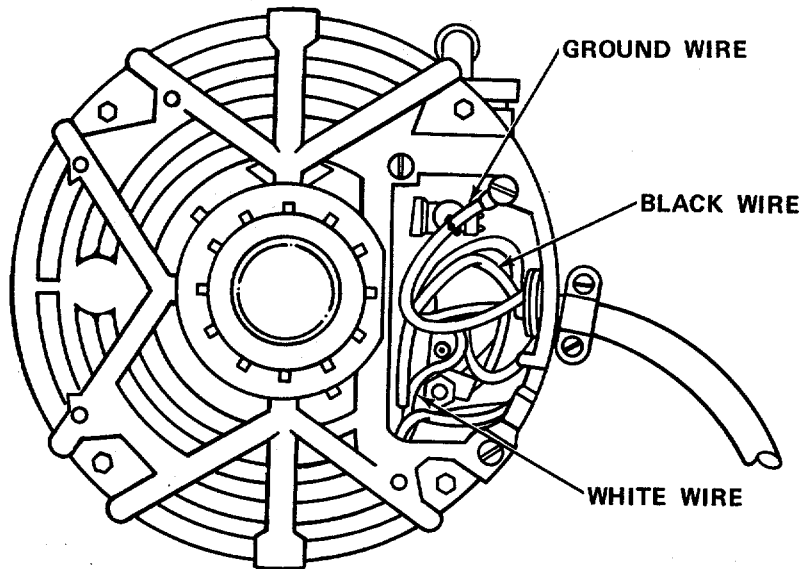
(2) If any check incorrect, replace power cord for vacuum control box (paragraph 6-16.8).

Step 2. Check continuity of vacuum pump rocker switch.

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

(b) If continuity not present, replace vacuum pump rocker switch (paragraph 6-16.4).

Step 3. Check continuity of power cord for vacuum pump as follows:



(a) Remove electrical cover plate on back side of vacuum pump.

(b) Check for zero ohm resistance between black wire on vacuum pump and black output wire of rocker switch.

Table 6-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

1. VACUUM PUMP DOES NOT TURN ON-Cont

switch. (c) Check for zero ohm resistance between white wire on vacuum pump and white output wire of rocker

(d) Check for zero ohm resistance between green wire on vacuum pump and ground post in control box.

(1) If all checks are correct, replace vacuum pump (paragraph 6-16.9).

(2) If any check incorrect, replace vacuum pump power cord (paragraph 6-16.8).

2. VACUUM PUMP DOES NOT BUILD UP CORRECT VACUUM.

Step 1. Check all vacuum hoses and connections for air leaks.

(a) If no air leaks are found in hoses or connections, proceed to step 2.

(b) Correct cause of air leak.

Step 2. Check for air leak around vacuum frame.

(a) If no leaks are found, proceed to step 3.

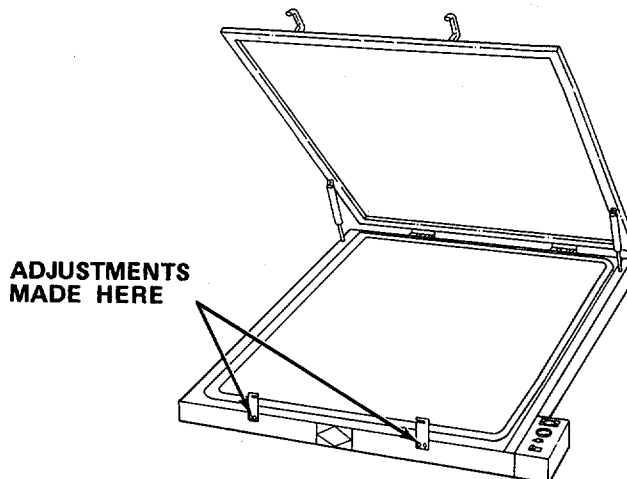


Table 6-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

2. VACUUM PUMP DOES NOT BUILD UP CORRECT VACUUM-Cont

(b) If leaks are found around vacuum frame, adjust left- and right- and latches to lock glass frame down tightly.

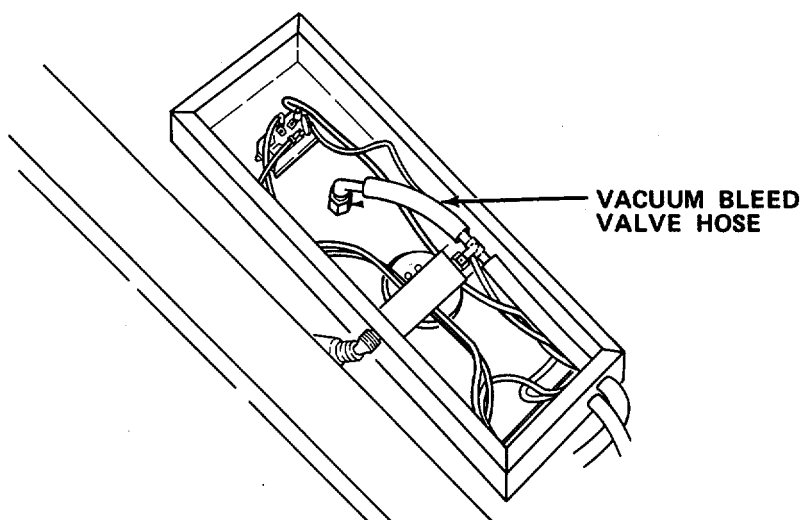
(c) If latches cannot be adjusted enough, replace vacuum blanket assembly (paragraph 6-16.1).

Step 3. Check for defective vacuum bleed valve as follows:

WARNING

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

(a) Unplug power cord for vacuum control box.



(b) Remove cover plate on underside of control box.

Table 6-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. VACUUM PUMP DOES NOT BUILD UP CORRECT VACUUM-Cont		
		(c) Disconnect vacuum hose for vacuum bleed valve and plug hose.
		(d) Plug in power cord for vacuum control box.
		(e) Turn on vacuum pump and observe vacuum pressure.
		(1) If pressure is still incorrect, proceed to step 4.
		(2) If correct pressure is now observed, replace vacuum bleed valve (paragraph 6-16.5).
		Step 4. Check for defective vacuum gage as follows:
		(a) Disconnect vacuum hose from vacuum pump.
		(b) Disconnect vacuum hose from center connection under vacuum frame.
		(c) Obtain a hose long enough to reach from vacuum pump to fitting under vacuum frame and connect hose to each connection.
		(d) Turn on vacuum pump and observe vacuum created in vacuum frame.
		(1) If correct vacuum is created in vacuum frame, replace vacuum gage (paragraph 6-16.6).
		(2) If incorrect vacuum is observed, flush vacuum pump (paragraph 6-16.10).
		(3) If problem remains, replace vacuum pump (paragraph 6-16. 9).

6-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the contact vacuum frame system. 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

PROCEDURES	PARAGRAPH
Replace Vacuum Blanket Assembly.....	6-16.1
Replace Glass Frame Glass	6-16.2
Replace Lift Arm	6-16.3
Replace Vacuum Pump Rocker Switch	6-16.4
Replace Vacuum Bleed Valve	6-16.5
Replace Vacuum Gage	6-16.6
Replace Power Cord for Vacuum Control Box	6-16.7
Replace Vacuum Pump Power Cord	6-16.8
Replace Vacuum Pump	6-16.9
Flush Vacuum Pump	6-16.10
Remove/Install Contact Vacuum Frame	6-16.11

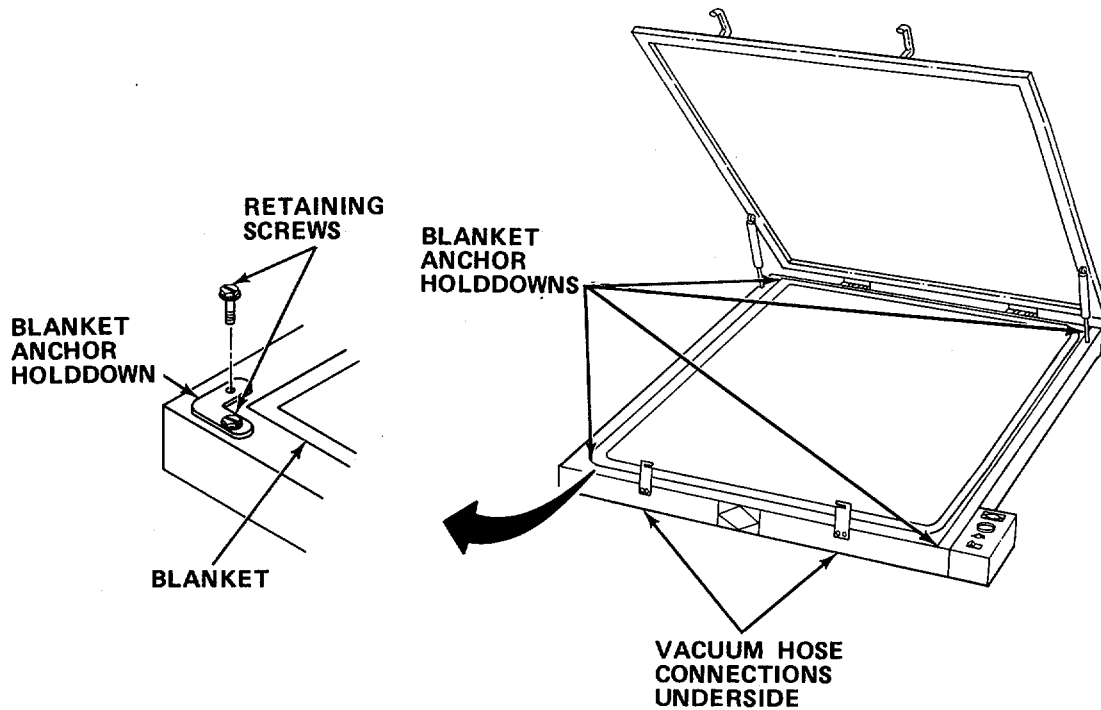
6-16.1 Replace Vacuum Blanket Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
Nutdriver Set

SUPPLIES: Vacuum Blanket Assembly



- a. Remove eight retaining screws and four blanket anchor holddowns.
- b. Carefully remove two vacuum hoses from the vacuum blanket assembly.
- c. Remove defective vacuum blanket assembly from vacuum frame base.
- d. Install new vacuum blanket assembly on vacuum frame base.
- e. Carefully reinstall two vacuum hoses to new vacuum blanket assembly.
- f. Reinstall four blanket anchor holddowns and retaining screws.

6-16.2 Replace Glass Frame Glass.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

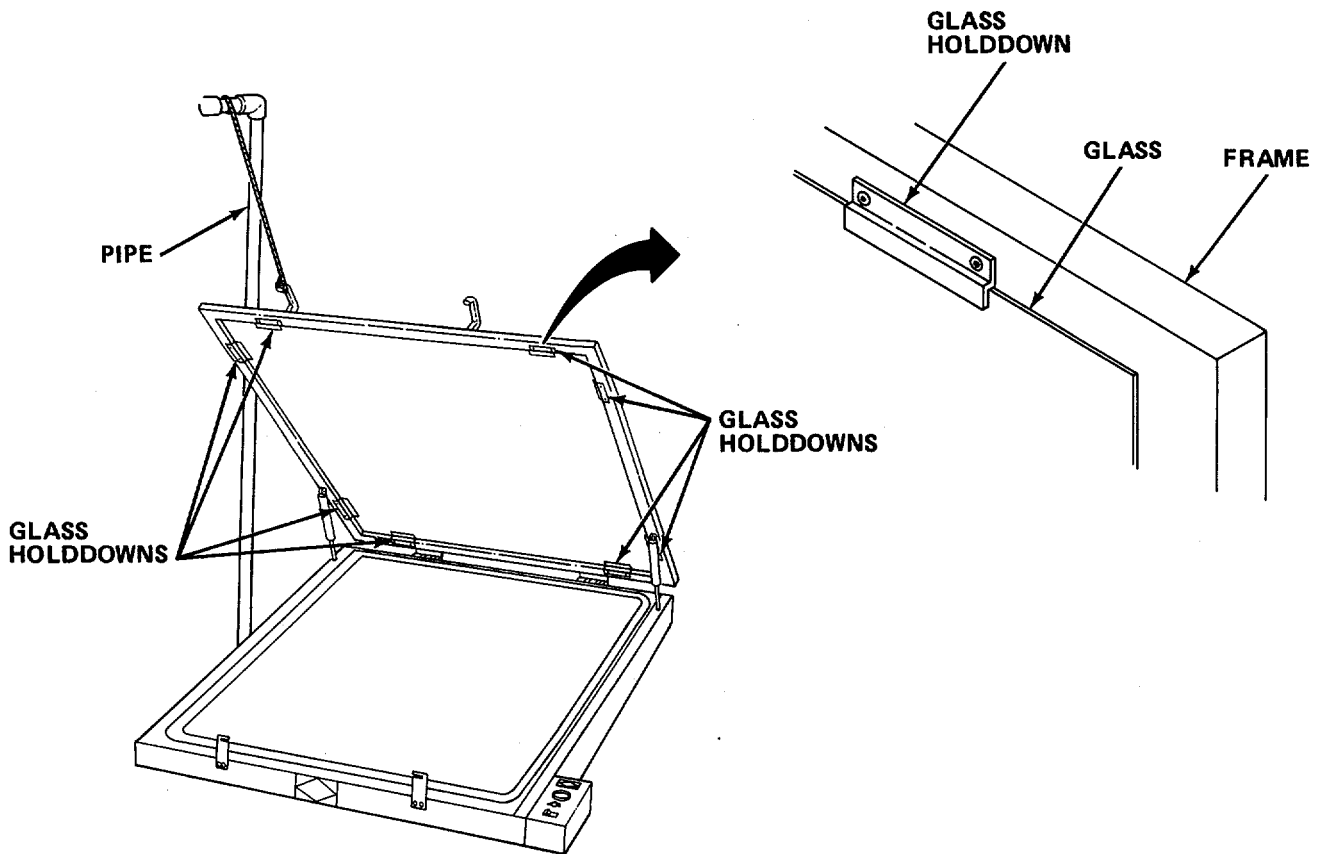
Tool Kit, Light Machine Repair
Hex Head Key Wrench Set

SUPPLIES: Glass
Cotton Twine, approximately 3 feet (Item 65, Appendix E)

PERSONNEL: Two persons are required to perform this procedure.

WARNING

- Serious injury may occur if inadequate number of personnel are used to remove/install glass. This glass weighs 25 lbs.
- To prevent serious injury, remove all pieces of broken glass possible, prior to raising glass frame to an upright position.



a. Unlock left- and right-hand latches and lift glass frame until the lift arms take hold and open the glass frame completely.

- b. Remove E clips from both lift arm bracket pins and remove pins.
- c. Allow lift arms to lie horizontally inside platemaker frame.
- d. Secure glass frame in an upright position by tying twine or rope from the left-hand latch to pipes from water tank.

WARNING

Additional pieces of broken glass may fall from frame as holddowns are removed or loosened. Exercise extreme caution to prevent personal injury.

- e. Carefully remove eight glass holddowns and remove defective glass.
- f. Clean glass frame and vacuum blanket to remove any broken glass.
- g. Carefully install new glass in frame and secure in place with glass holddowns.
- h. Slack the twine or rope from the water pipes to slightly lower glass frame enough to reinstall lift arms.
- i. Aline lift arms into lift arm brackets. Secure with lift arm bracket pins and E clips.
- j. Remove rope or twine, and lower glass frame. Lock left-hand and right-hand latches in place.

6-16.3 Replace Lift Arm.

MOS: 83FJ6, Reproduction Equipment Repairer

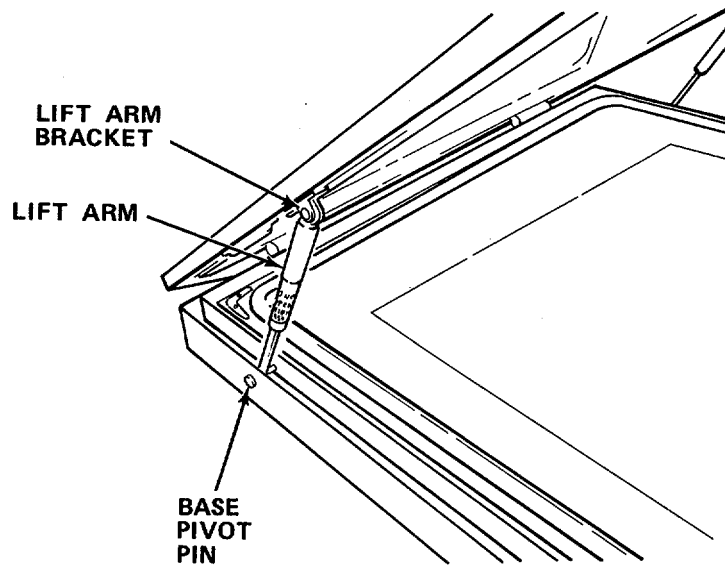
TOOLS:

Tool Kit, Light Machine Repair
Hex Head Key Wrench Set
Flat Tip Screwdriver
Needle Nose Pliers

SUPPLIES: Lift Arm

Cotton Twine, approximately 3 feet (Item 65, Appendix E)

- a. Tie up glass frame with rope to prevent it from falling when lift arm is removed.



- b. Carefully remove three E clips on pivot pin at base of lift arm.
- c. Using pliers, carefully move pivot pin toward outside of vacuum frame.
- d. Remove lift arm bracket from glass frame.
- e. Remove E clip from lift arm bracket pin and remove pin and defective lift arm.
- f. Install new lift arm, and lift arm bracket pin into lift arm bracket. Retain in place with E clip.

- g. Move pivot pin back through outside frame, through lift arm and out inside frame.
- h. Reinstall E clips on pivot pin.
- i. Remove rope used to hold up glass frame.

6-16.4 Replace Vacuum Pump Rocker Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

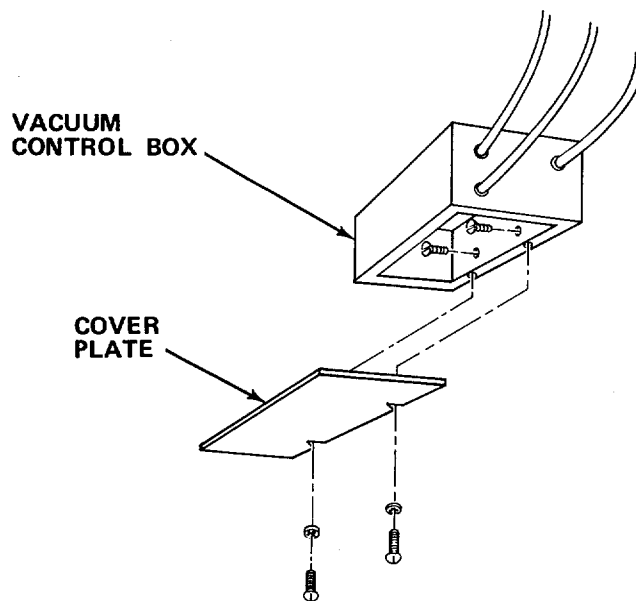
- Tool Kit, Light Machine Repair
- Flat Tip Screwdriver
- Slip Joint Pliers

SUPPLIES: Rocker Switch

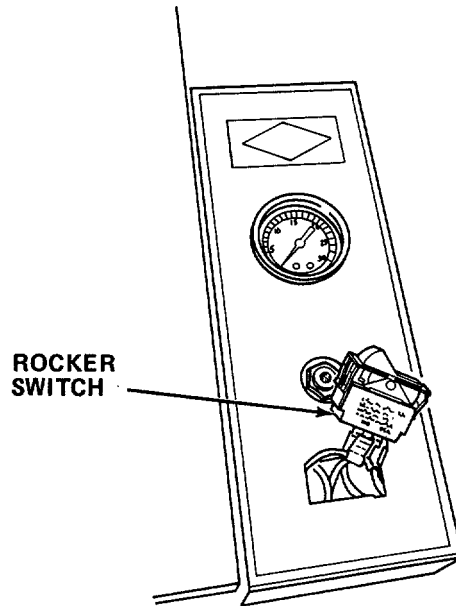
WARNING

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

- a. Unplug power cord for vacuum control box.



- b. Remove cover plate on underside of vacuum control box.



- c. Tag and disconnect four wires from vacuum pump rocker switch.
- d. Push in spring clip retainer around rocker switch and remove defective switch through the top of the control box.
- e. Install new switch through the top of the control box and snap into place.
- f. Reconnect four wires to new switch.
- g. Reinstall cover plate on underside of vacuum control box.
- h. Plug in power cord for vacuum control box.

6-16.5 Replace Vacuum Bleed Valve.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

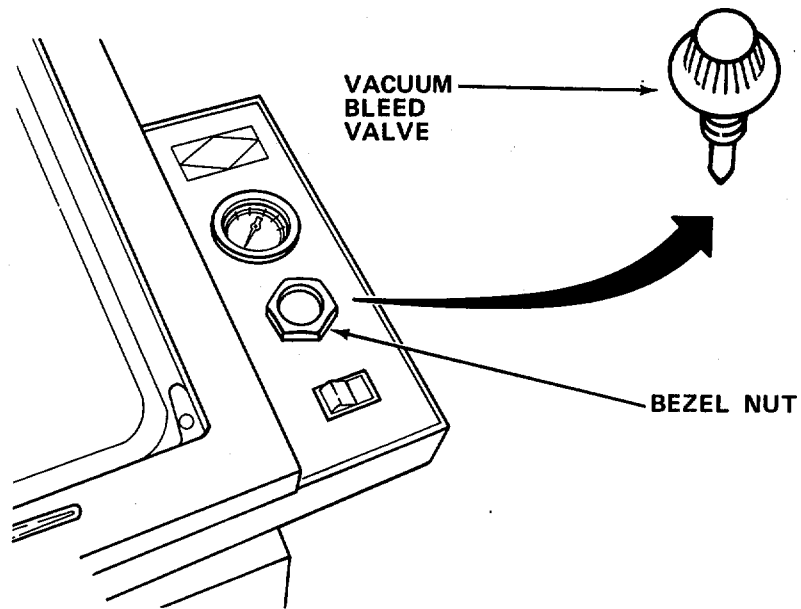
Tool Kit, Light Machine Repair
 Flat Tip Screwdriver
 Combination Wrench Set

SUPPLIES: Vacuum Bleed Valve

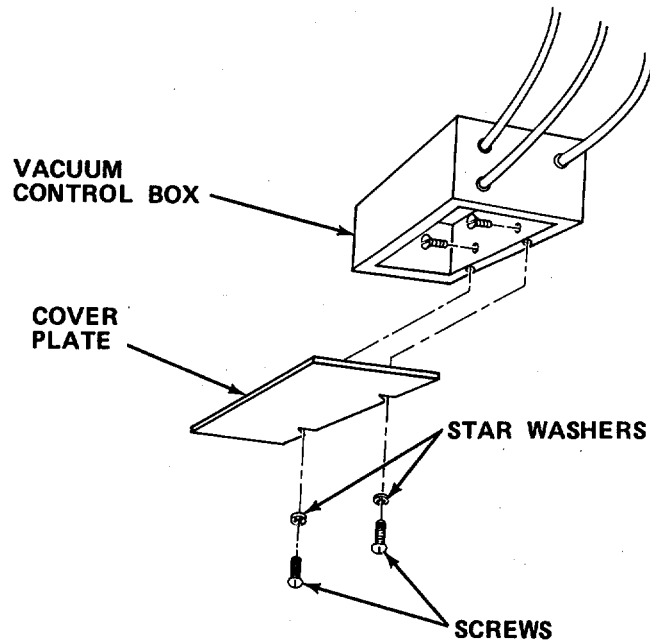
WARNING

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

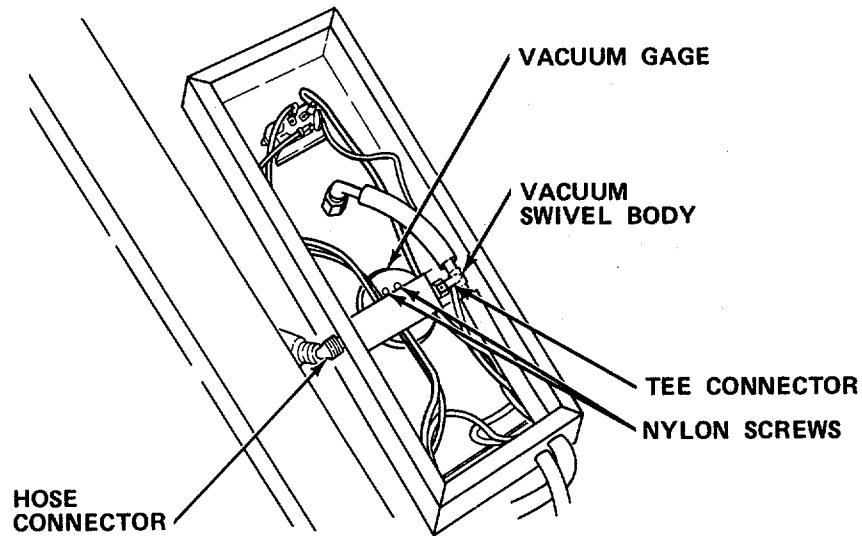
- a. Unplug power cord for vacuum control box.



- b. Remove vacuum bleed valve control knob by turning left until knob and needle valve are removed.



- c. Remove cover on underside of vacuum control box.



- d. Remove vacuum hose from elbow fitting on bottom of vacuum bleed valve.
- e. Remove bezel nut from top of control box and remove defective vacuum bleed valve housing.
- f. Remove elbow fitting from vacuum bleed valve.
- g. Reinstall elbow fitting to new vacuum bleed valve. Use care not to overtighten.
- h. Install new vacuum bleed valve housing and secure with bezel nut.
- i. Reinstall vacuum hose to elbow fitting.
- j. Reinstall cover on underside of vacuum control box.
- k. Loosen setscrew on vacuum bleed valve control knob and remove defective needle valve.
- l. Install new needle valve onto control knob and tighten setscrew.
- m. Reinstall vacuum bleed valve control knob by inserting into valve and turning right until valve is closed.
- n. Plug in power cord for vacuum control box.

6-16.6 Replace Vacuum Gage.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

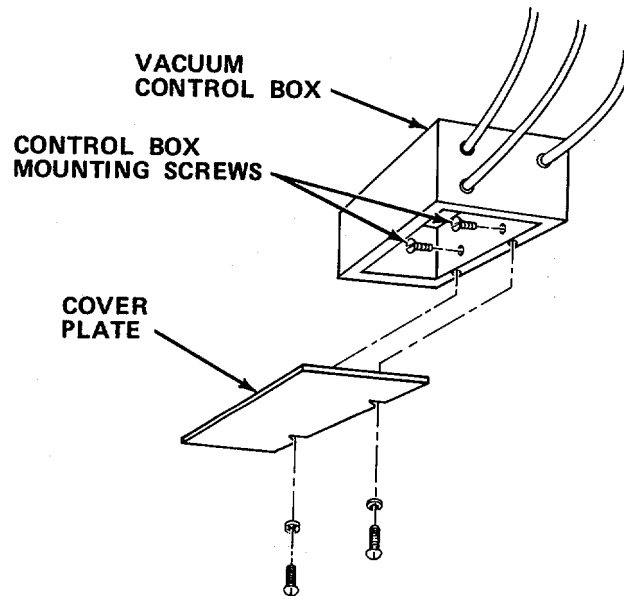
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Offset Flat Tip Screwdriver
Combination Wrench Set

SUPPLIES: Vacuum Gage

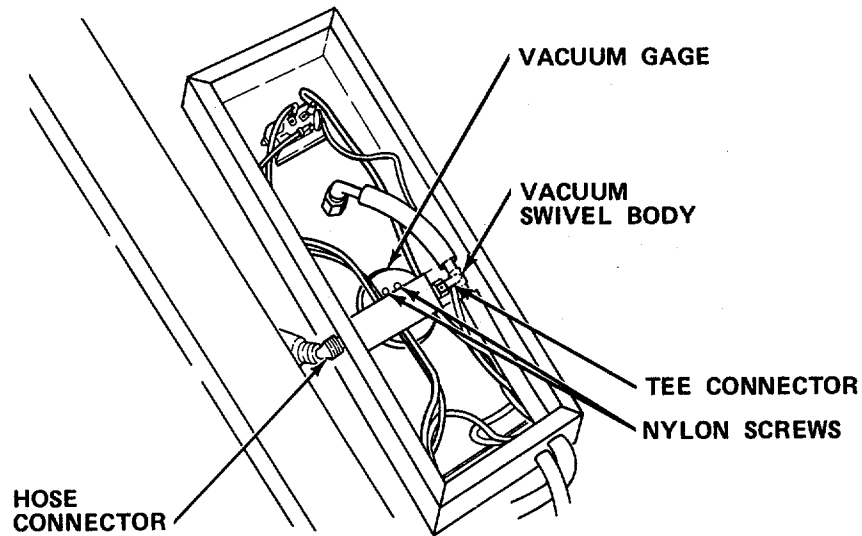
WARNING

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

- a. Unplug power cord for vacuum control box.



- b. Remove cover plate on underside of vacuum control box.
c. Remove vacuum frame vacuum hose from control box.
d. Remove two screws attaching control box to frame and set control box aside.



- e. Remove plastic hose connector from vacuum swivel body.
- f. Remove vacuum hoses from tee connector on vacuum swivel body.
- g. Remove tee connector on vacuum swivel body.
- h. Loosen two nylon screws on vacuum swivel body and remove vacuum swivel body.
- i. Remove nut and vacuum swivel shaft.
- j. Remove two mounting nuts from vacuum gage and remove defective vacuum gage through top of control box.
- k. Install new vacuum gage through top of control box, place mounting bracket around gage so that mounting studs fit through the holes. Then attach in place with mounting nuts. Be sure gage is properly centered on panel.
- l. Reinstall vacuum swivel shaft and nut on bottom of vacuum gage.
- m. Reinstall vacuum swivel body on vacuum swivel shaft and tighten two nylon screws.
- n. Reinstall tee connector on vacuum swivel body.
- o. Reinstall vacuum hoses on tee connector.
- p. Reinstall plastic hose connector on vacuum swivel body.
- q. Reconnect vacuum frame vacuum hose on control box.
- r. Reinstall vacuum control box on frame.
- s. Reinstall cover plate on underside of vacuum control box.
- t. Plug in power cord for vacuum control box.

6-16.7 Replace Power Cord for Vacuum Control Box.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

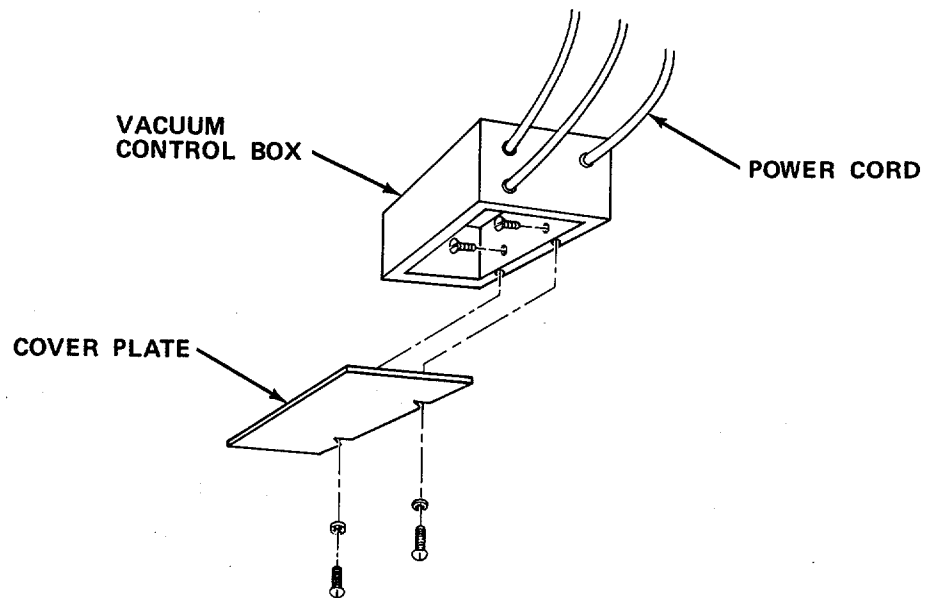
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Slip Joint Pliers

SUPPLIES: Power Cord (96 in. long)

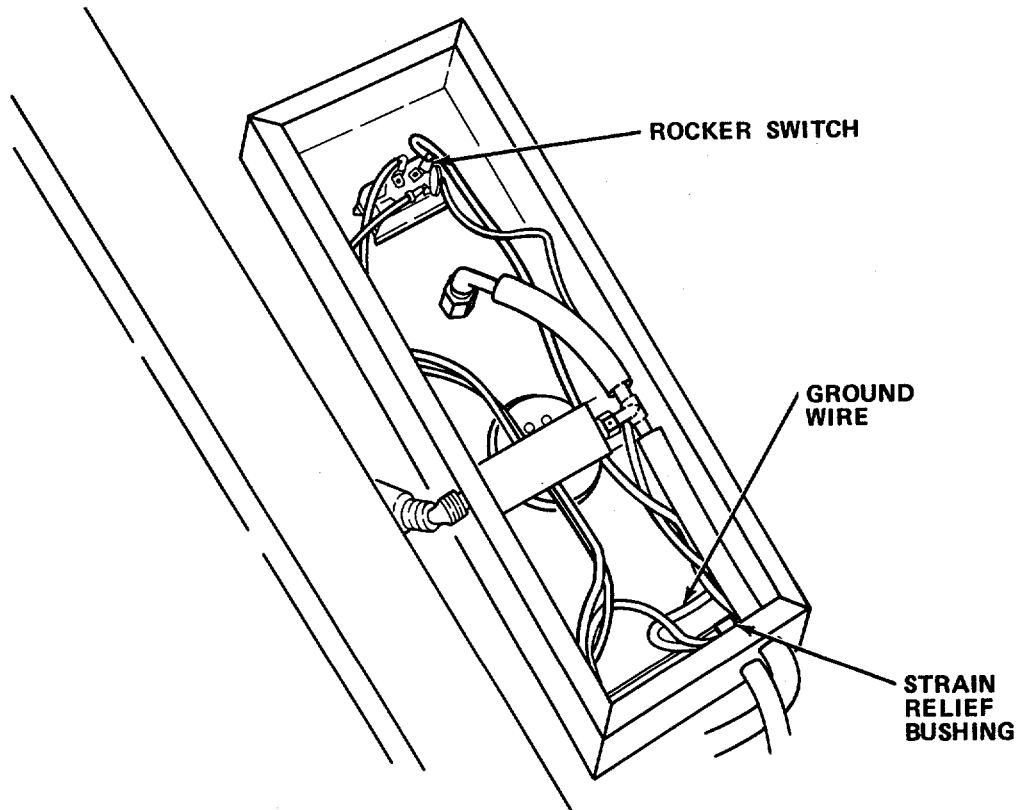
WARNING

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

- a. Unplug power cord for vacuum control box.



- b. Remove cover plate on underside of vacuum control box.



- c. Tag and disconnect vacuum control box power cord wires from rocker switch.
- d. Remove nut; then tag and disconnect ground wire from bolt on control box.
- e. Carefully remove strain relief bushing and power cord for vacuum control box.
- f. Remove strain relief bushing from defective power cord.
- g. Install strain relief bushing on new power cord.
- h. Reinstall power cord into control box and snap strain relief bushing into place.
- i. Reconnect power cord wires to rocker switch.
- j. Reconnect ground wire to bolt in control box, and secure with nut.
- k. Reinstall cover plate on underside of control box.
- l. Plug in power cord for vacuum control box.

6-16.8 Replace Vacuum Pump Power Cord.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

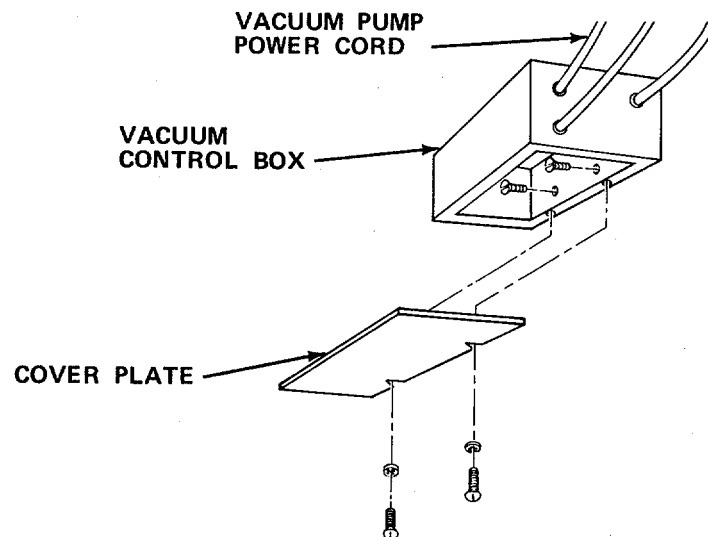
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Slip Joint Pliers
Combination Wrench Set

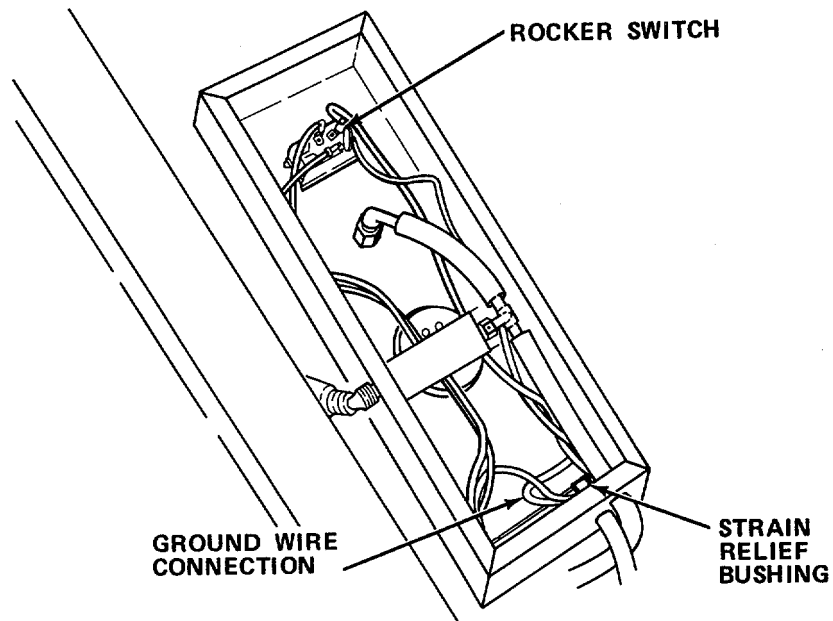
SUPPLIES: Power Cord (70 in. long)

WARNING

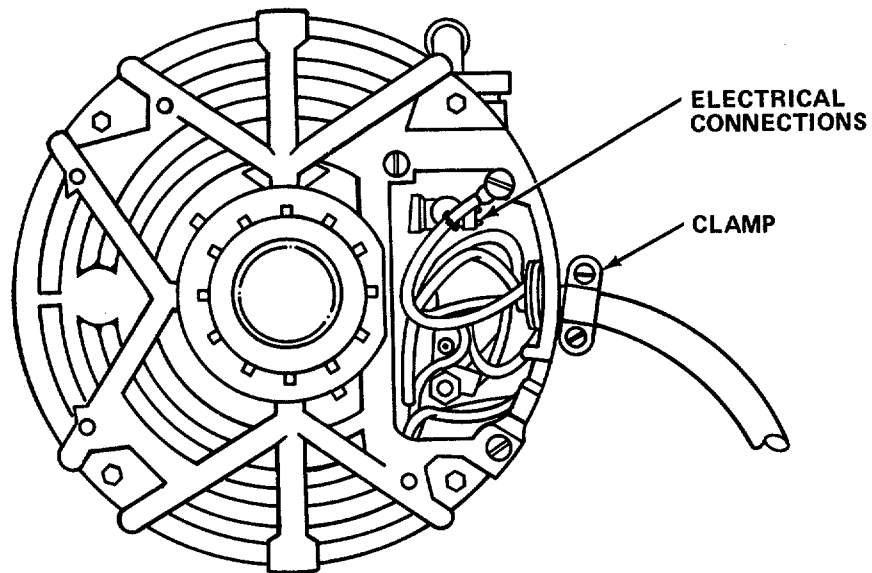
Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

- a. Unplug power cord for vacuum control box.





- c. Tag and disconnect wires for vacuum pump from rocker switch.
- d. Remove nut; then tag and disconnect ground wire from bolt on control box.
- e. Carefully remove strain relief bushing and power cord from control box.
- f. Remove strain relief bushing from defective power cord.



- g. Remove electrical cover plate on back side of vacuum pump.

- h. Tag and disconnect wires for vacuum pump.
- i. Loosen clamp and remove defective power cord.
- j. Install new power cord through clamp on side of vacuum pump and tighten down clamp.
- k. Reconnect wires to vacuum pump.
- l. Reinstall electrical cover plate on back side of vacuum pump.
- m. Reinstall strain relief bushing onto new power cord.
- n. Reinstall power cord into control box and snap strain relief bushing into place.
- o. Reconnect wires to rocker switch. Reconnect ground wire on bolt in control box, and secure with nut.
- p. Reinstall cover plate on underside of control box.
- q. Plug in power cord for vacuum control box.

6-16.9 Replace Vacuum Pump.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

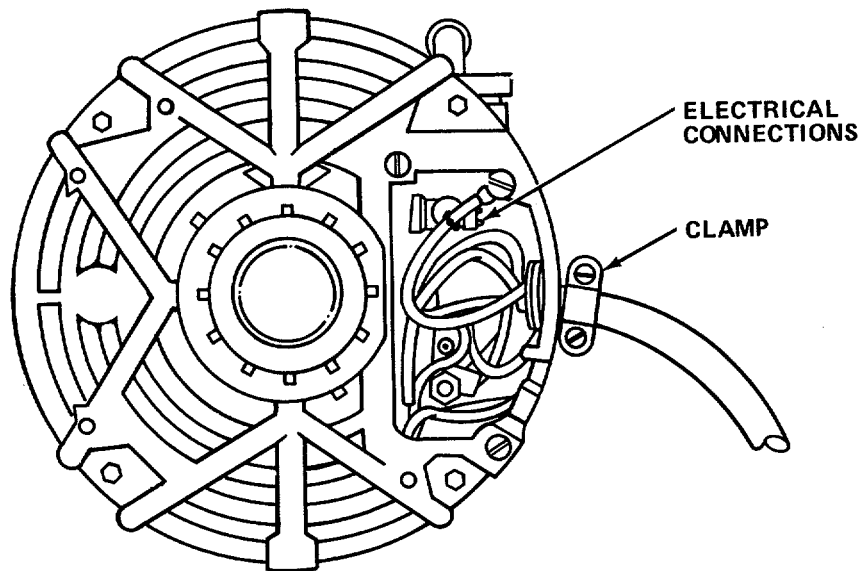
Tool Kit, Light Machine Repair
Flat Tip Screwdriver
Combination Wrench Set

SUPPLIES: Vacuum Pump

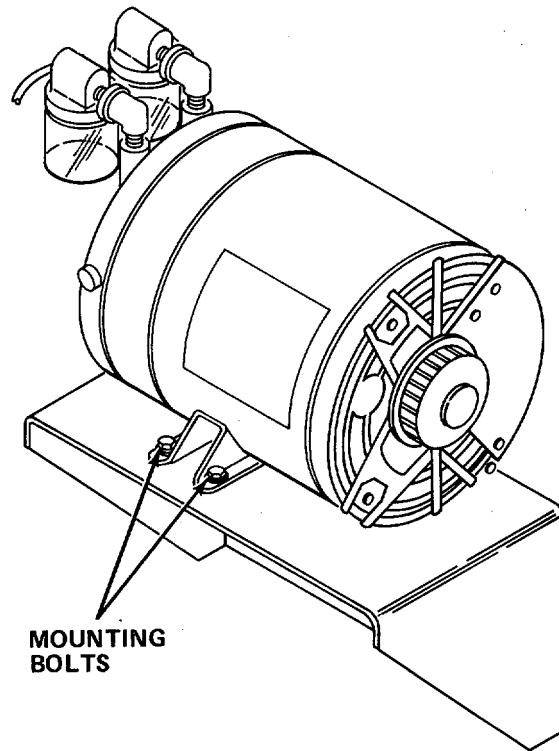
WARNING

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

- a. Unplug power cord for vacuum control box.



- b. Remove electrical cover plate on back side of vacuum pump.
- c. Tag and disconnect wires from vacuum pump.
- d. Loosen clamp and remove power cord.



- e. Remove four mounting bolts, nuts, and washers from vacuum pump and remove defective vacuum pump.
- f. Install new vacuum pump and mount in place using four mounting bolts, nuts and washers.
- g. Install power cord through clamp on side of vacuum pump and tighten clamp.
- h. Reconnect wires to vacuum pump.
- i. Reinstall electrical cover plate on back side of vacuum pump.
- j. Plug in power cord for vacuum control box.

6-16.10 Flush Vacuum Pump.

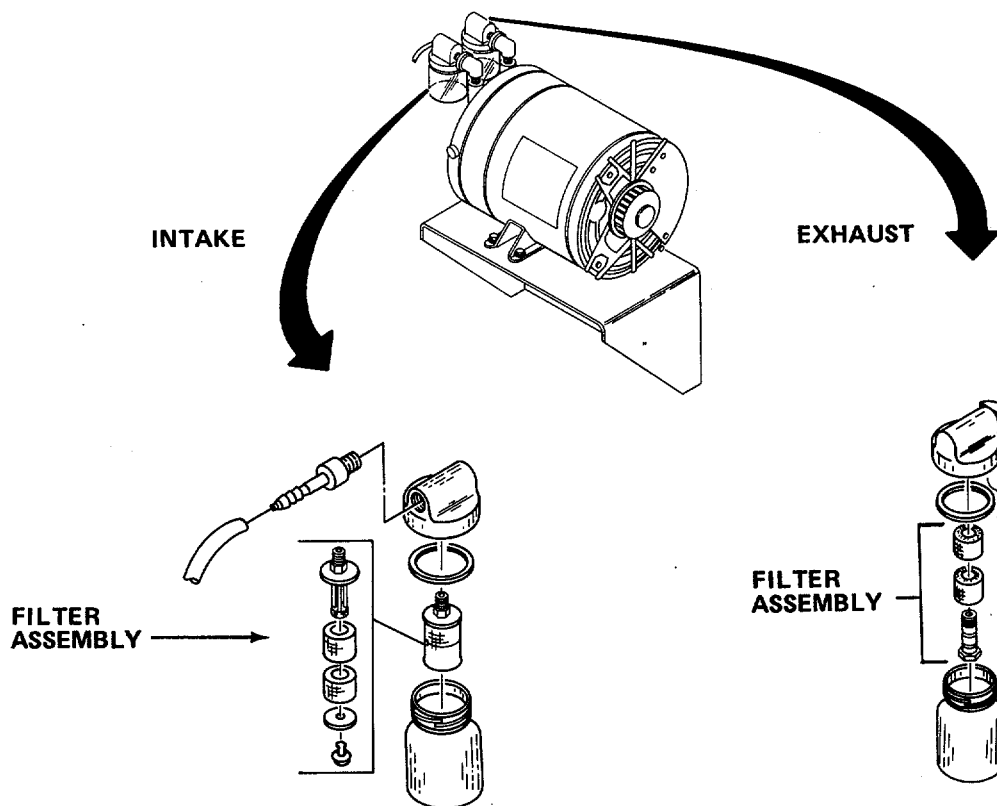
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: None required

SUPPLIES: Nonflammable Flushing Solvent (Item 54, Appendix E) Rags (Item 47, Appendix E) Vacuum Hose, 18 in. long

WARNING

- Always wear eye/face protective equipment when using solvent to prevent injury to eyes.
- Fumes and chemicals used in flushing vacuum pump may result in serious injury if adequate ventilation is not provided.
 - a. Turn off power switch for vacuum pump.



- b. Remove glass jars from around intake and exhaust.
- c. Carefully remove intake and exhaust filter assemblies.
- d. Replace glass jars around intake and exhaust.
- e. Remove vacuum hose from intake fitting. Install short length of vacuum hose on fitting.
- f. Turn on vacuum pump switch, and suction 1 to 2 ounces of solvent into inlet through short length of vacuum hose. Repeat as necessary.
- g. Turn off power switch for vacuum pump.
- h. Remove short length of vacuum hose from intake fitting and reinstall end of hose to vacuum control box.
- i. Remove jars and carefully reinstall intake and exhaust filter assemblies.
- j. Reinstall glass jars around intake and exhaust.

6-16.11 Remove/Install Contact Vacuum Frame.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
 Combination Wrench Set
 Flat Tip Screwdriver
 Offset Flat Tip Screwdriver

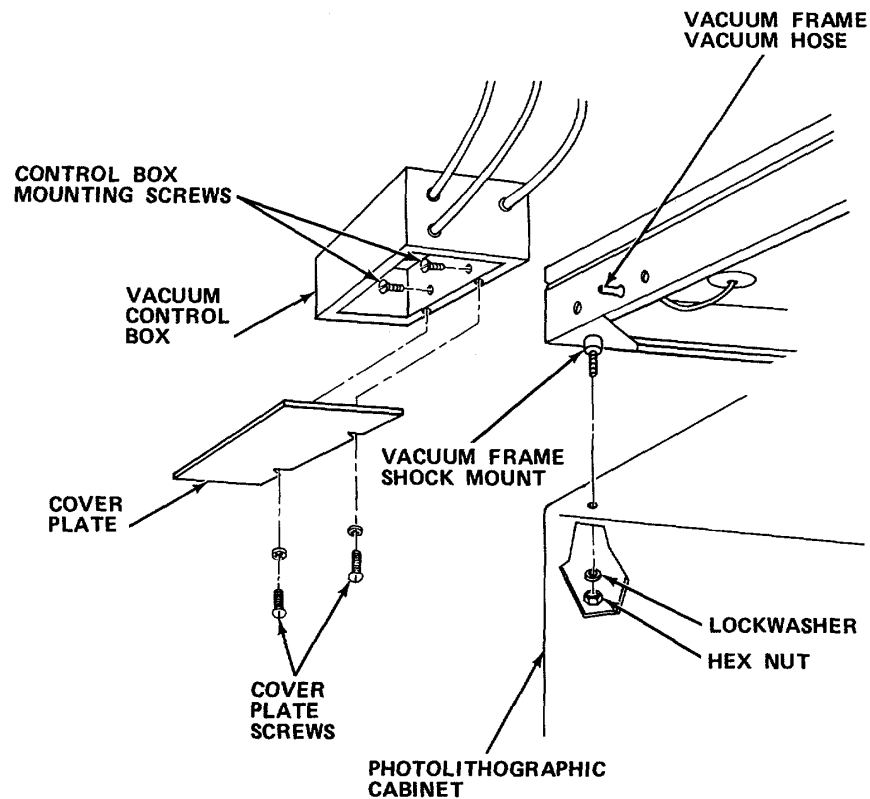
SUPPLIES: Contact Vacuum Frame

PERSONNEL: Two persons are required to perform this procedure.

WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before beginning to remove the contact vacuum frame.

- a. Unplug power cord for vacuum control box.

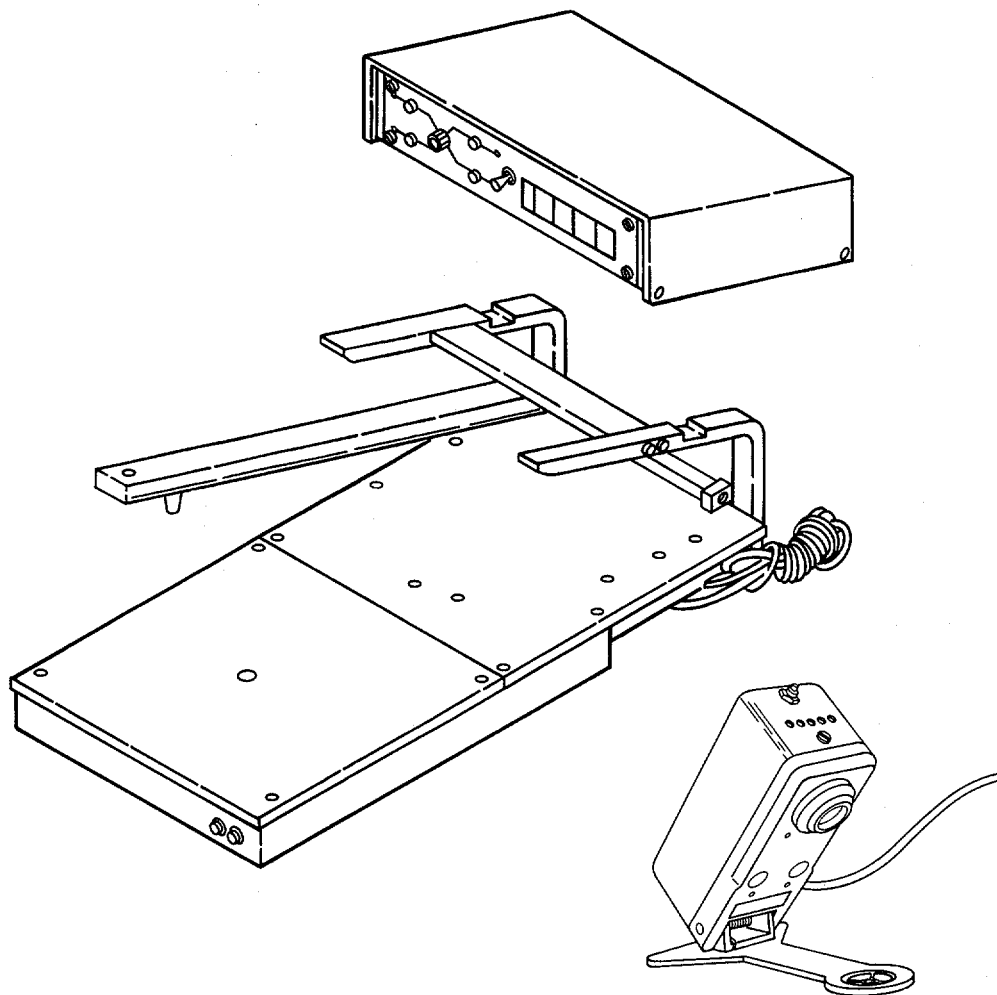


- b. Remove cover plate on underside of vacuum control box.
- c. Remove two screws securing vacuum control box to vacuum frame.
- d. Remove vacuum frame vacuum hose from control box. Set control box aside.
- e. Remove top drawers from 10-drawer photolithographic cabinet.
- f. Remove hex nuts and lockwashers securing vacuum frame shock mounts to each corner of photolithographic cabinet.
- g. Lift defective contact vacuum frame from photolithographic cabinet, and remove from van.
- h. Install new contact vacuum frame.'
- i. Reinstall hex nuts and lockwashers to secure vacuum frame to photolithographic cabinet.
- j. Reattach vacuum frame vacuum hose to control box, and secure control box to frame with two screws.
- k. Reinstall cover plate on underside of vacuum control box.
- l. Reinstall drawers in photolithographic cabinet.
- m. Plug in power cord.

6-17. 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 7

DIGITAL DENSITOMETER

Section I. INTRODUCTION

7-1. GENERAL INFORMATION.

7-1.1 Scope.

- a. Model Number and Equipment Name. Model RD/TD-144 Digital Densitometer.
- b. Purpose of Equipment. To measure color and black and white densities.

7-1.2 Glossary.

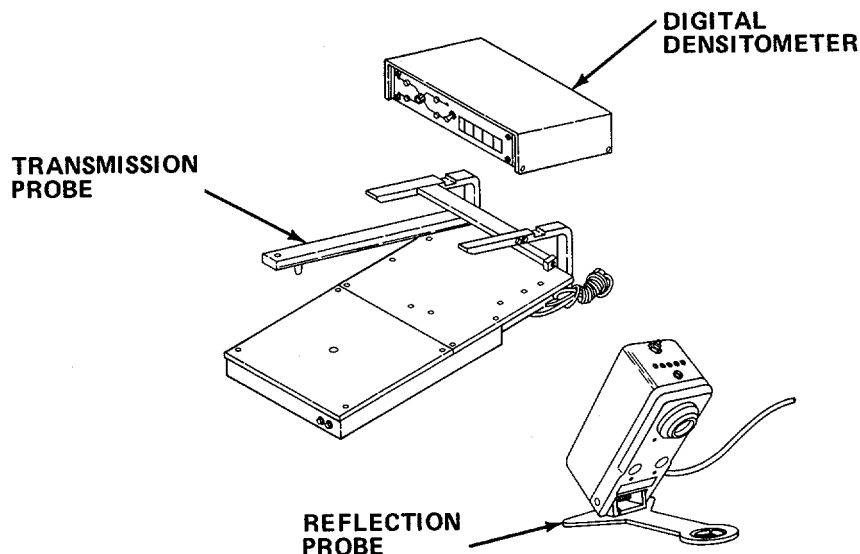
Cathode	The negative electrode of a tube or diode.
Dynode	An electrode that amplifies current by means of secondary electron emission in an electron tube.
Photomultiplier Tube	A light sensitive, amplifying phototube with one or more dynodes between its photocathode and the output electrode.

7-2. EQUIPMENT DESCRIPTION.

7-2.1 Equipment Characteristics, Capabilities, and Features.

- a. Independent filter calibration controls.
- b. Quick-disconnect probe cable connector.
- c. 115 V ac or 220 V ac operation.
- d. Solid-state circuitry.
- e. Digital readout.
- f. Readout hold.
- g. Self-contained.

7-2.2 Location and Description of Major Components.



- a. DIGITAL DENSITOMETER. Determines density and provides a digital readout.
- b. REFLECTION PROBE. Collects diffused light from sample surface and inputs it to densitometer.
- c. TRANSMISSION PROBE. Collects diffused light that passes through a sample and inputs it to densitometer.

7-2.3 Equipment Data.

Power Requirements	85-135 V or 170-270 V, 50/60 Hz, single-phase, 30 watts
Density Range	0.000 to 4.000 and over
Readout	4 digit, 7/8 in. (22 mm) high numerals
Digital Readout Accuracy Range	±0.015
Measurement Time	1/50 second maximum
Sampling Rate	5 measurements per second minimum
Weight	
Densitometer	13.5 lbs (6.12 Kg)
Reflection Probe	1.5 lbs (.68 Kg)
Transmission Probe	16 lbs (7.26 Kg)

Standard Filters	Gold Wratten #106 Red Wratten #25 Green Wratten #58 Blue Wratten #47
Lamp Life	20,000+ hours
Dimensions	
Densitometer	
Width	15.25 in. (38.73 cm)
Height	4.00 in. (10.16 cm)
Depth	12.00 in. (30.48 cm)
Transmission Probe	
Width	15.25 in. (38.73 cm)
Height	19.50 in. (49.53 cm)
Depth	11.00 in. (27.94 cm)
Reflection Probe	
Width	2.25 in. (5.71 cm)
Height	2.625 in. (6.66 cm)
Depth	5.25 in. (13.33 cm)

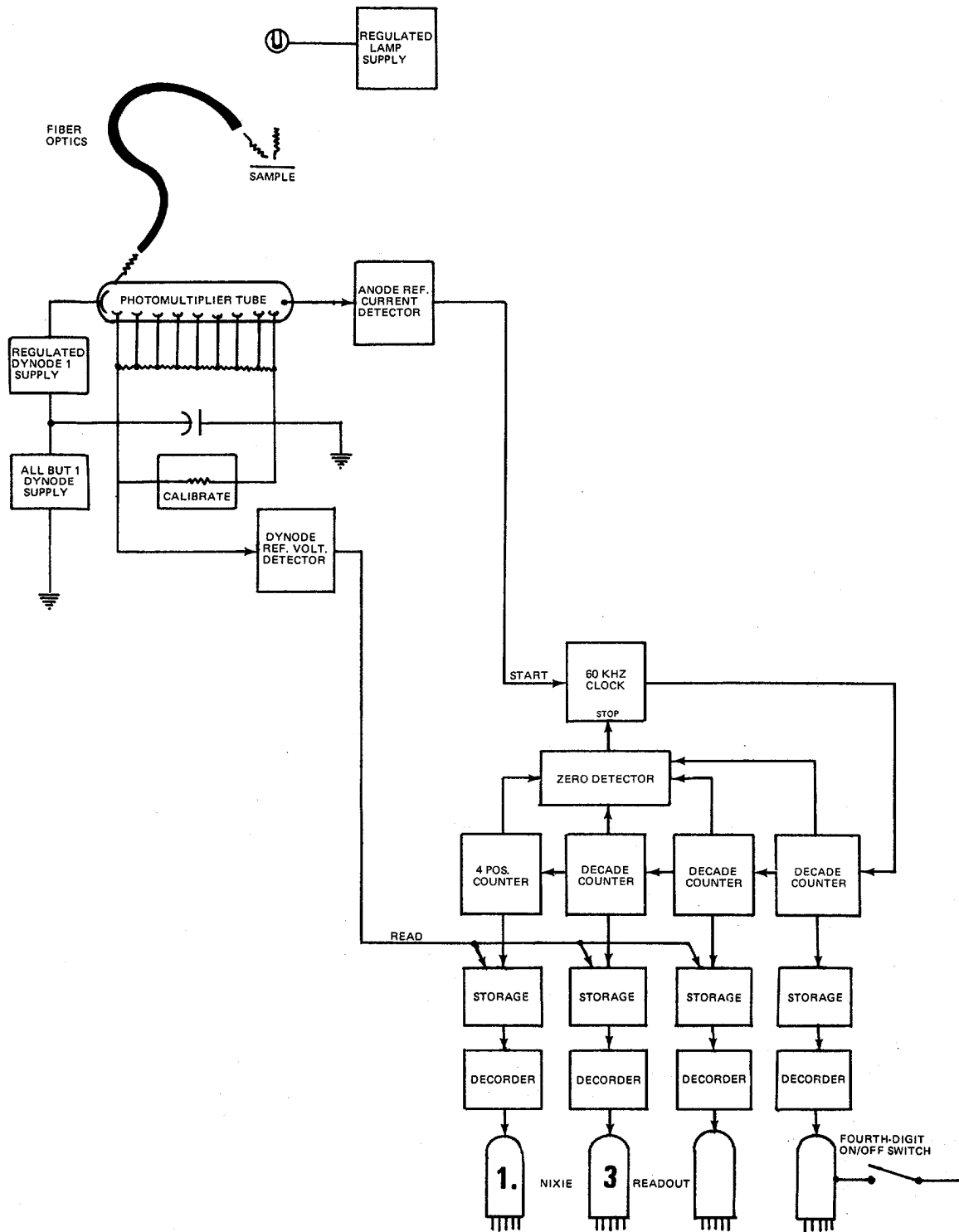
7-3. TECHNICAL PRINCIPLES OF OPERATION.

7-3.1 General. The digital densitometer is a self-contained light measuring instrument. It consists of the densitometer, transmission probe, and reflection probe.

a. Reflection Probe. The reflection probe directs light from a lamp through a lens and mirror optical system and strikes the unknown sample. Diffused light from the surface of the sample is collected by a group of fiber optic bundles. The bundles direct the light to the densitometer, where it is translated into a density measurement and displayed as a digital readout.

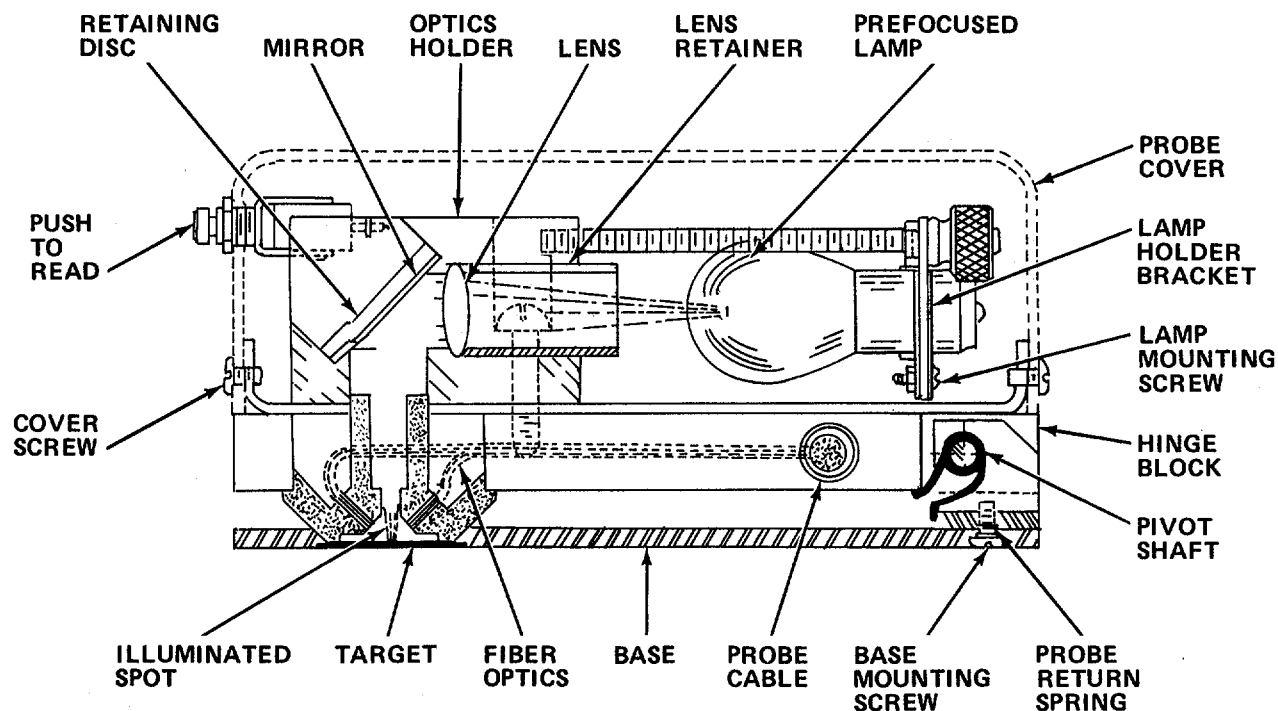
b. Transmission Probe. Within the transmission probe, light from a lamp is filtered by an infrared rejection filter, then directed through a condensing lens and mirror system and on through an aperture assembly. The light strikes the unknown sample and all diffused light passing through the sample is collected by a diffuser and group of fiber optic bundles, where it is directed to the densitometer and passes through a filter. From there, it is translated into a density measurement, which is displayed in the digital readout.

7.3.2 Detailed Theory of Operation.

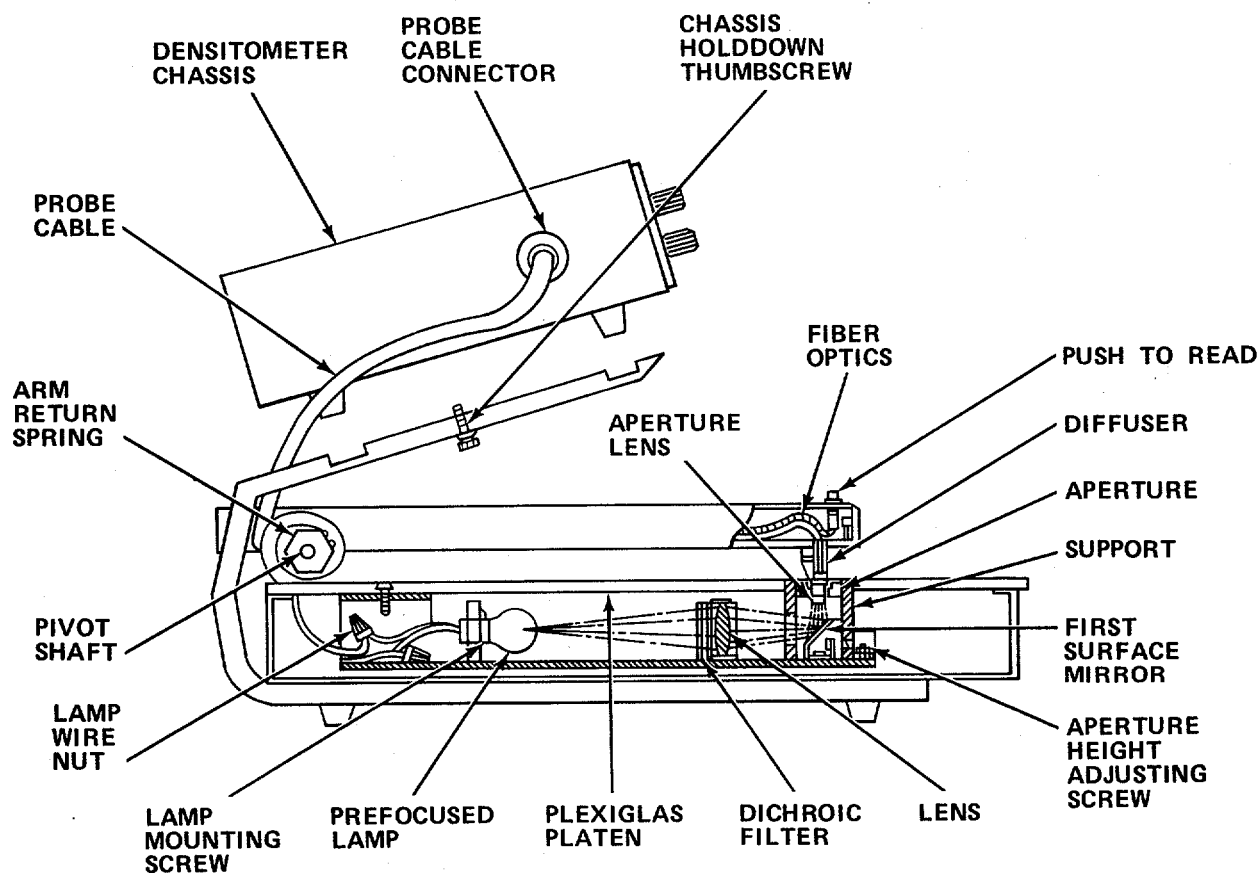


a. The densitometer employs a technique whereby density of an unknown sample is converted to a time period. The time period is precisely proportional to the density of the sample. Measurement of the time period results in a digital readout which is calibrated in terms of density. The entire measurement cycle occurs within 1/60 of a second (60 Hz power operation).

b. A regulated power supply provides low voltage power for the filament lamp located within the reflection probe housing. It also supplies low voltage power for the filament lamp located within the transmission probe housing when the transmission probe is in use.



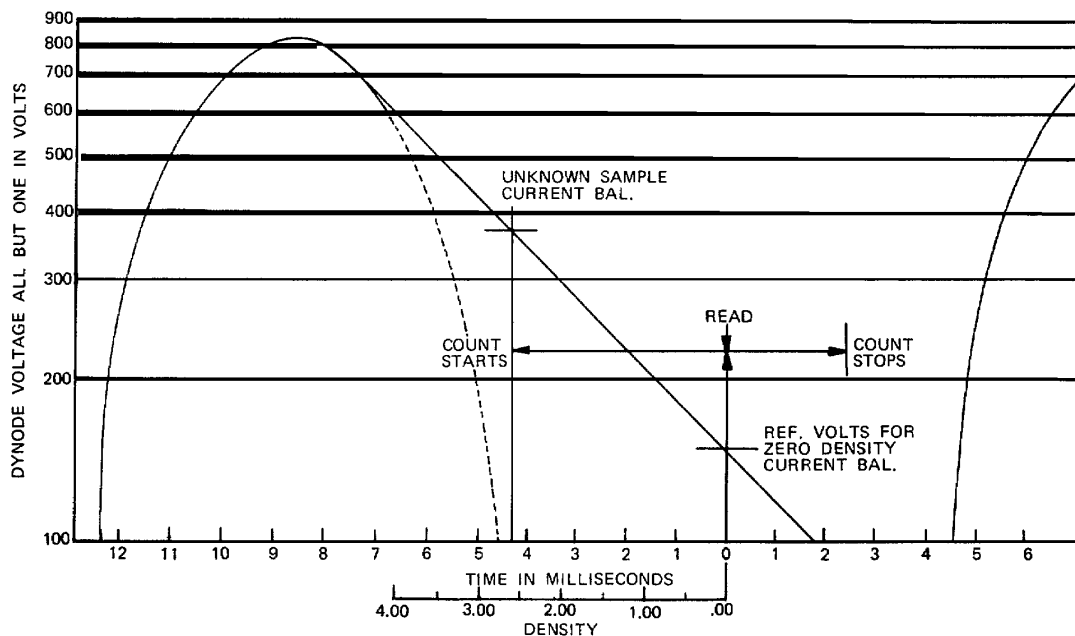
c. Within the probe housing, light from the prefocused lamp is directed by a lens and mirror and caused to strike the unknown sample. The light strikes the sample at a 90° angle relative to the surface. Diffused light that is reflected back from the surface of the sample is collected by a group of fiber optic bundles. The bundles are spaced evenly between 0° and 360° at a 45° angle relative to the surface. Light collected by the fiber optic bundles is directed back to the densitometer. The light then passes through a filter system, and is directed on the photosensitive cathode of the photomultiplier tube.



d. Within the transmission probe, light from the lamp is filtered by an infrared rejection filter, then directed through the lens and mirror system. It then goes through an aperture assembly and strikes the unknown sample at a 90° angle relative to the plane of the surface. All diffused light passing through the sample is collected by a diffuser and a group of fiber optic bundles and directed back to the densitometer, where it passes through a filter and is directed upon the photosensitive cathode of the photomultiplier tube.

e. Power from the internal power supply is periodically applied to the photomultiplier tube dynode network. Each cycle of power results in the measurement of the unknown sample density.

f. When the read pushbutton is pressed, it causes the measured density to be displayed as a digital readout. During a portion of each cycle of the power source, the photomultiplier tube dynode network charges to a voltage greater than that required for measurement of the maximum density within the range of the densitometer. During the remaining portion of the power source cycle, the photomultiplier tube dynode network voltage decreases with time, producing the change in dynode voltage required for a linear density measurement.



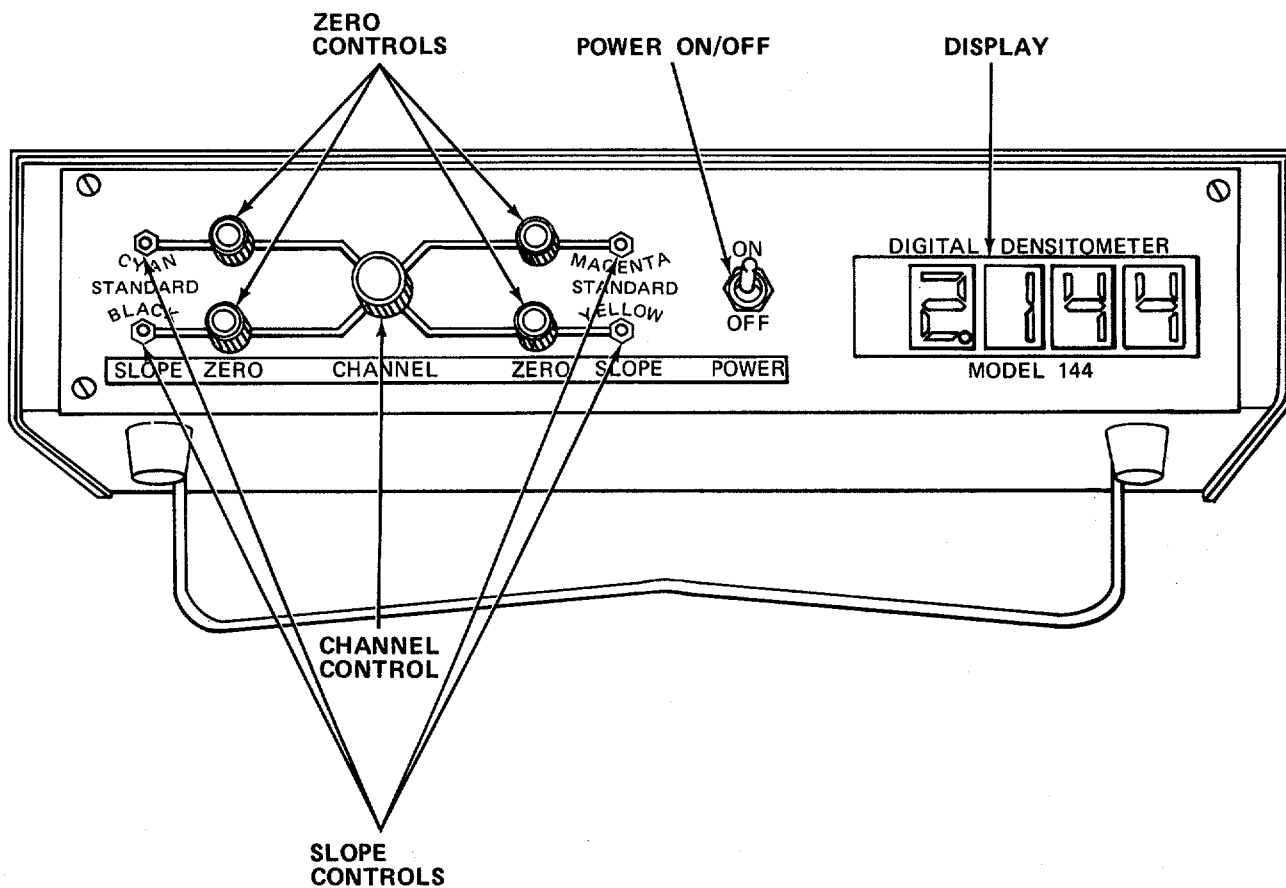
g. Current from the photomultiplier tube is monitored, and a START pulse is generated when the output current equals a predetermined reference value. When the dynode voltage has decreased to the standard reference value, approximately 150 volts, a READ pulse is generated. The time between these two pulses (START and READ) increases directly proportional to increasing density values. The START pulse starts the operation of a 60,000 Hz oscillator, which supplies clock pulses to the integrated circuit counters, which begin counting upward from zero. Occurrence of the READ pulse transfers the accumulated clock pulse count into the storage registers, where it is used to produce the corresponding reading in the digital readouts.

h. The counter continues counting until it has accumulated 400 counts, which is electrically equivalent to zero counts. At this time, the counter is stopped until the next measurement cycle. Releasing the probe read pushbutton allows the last measured value to remain displayed in the digital readout. If the READ pulse occurs before the START pulse, a minus (-) sign will appear at the left side of the display. This is to prevent the possibility of setting a zero control incorrectly.

Section II. OPERATING INSTRUCTIONS

7-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.

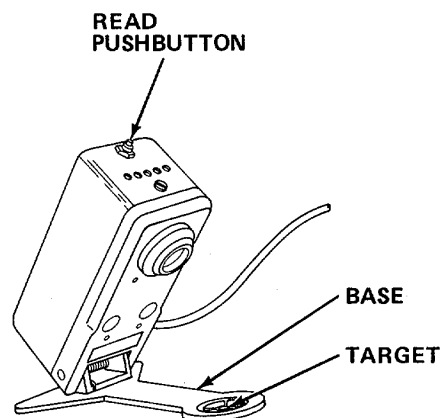
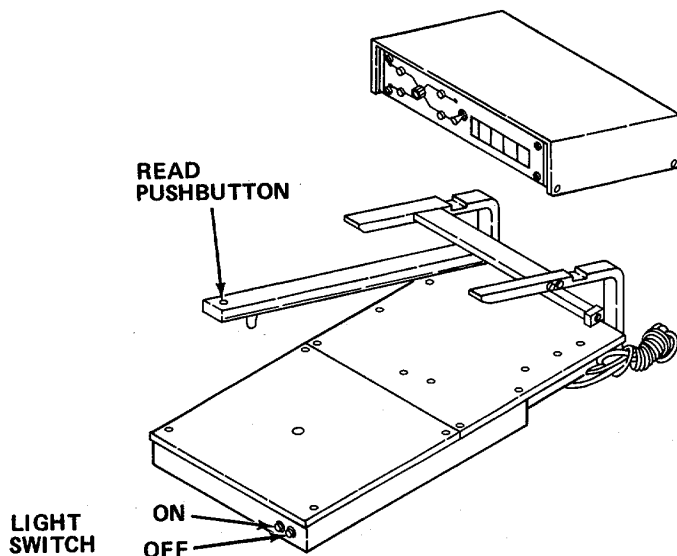
CONTROL OR INDICATOR	FUNCTION
----------------------	----------



POWER ON/OFF Switch	Applies power to all circuits in the densitometer, transmission probe, and reflection probe.
CHANNEL Control Switch	Selects filter to be used in the optical system.
ZERO Controls (Four)	Standardize low density readings.
SLOPE Controls (Four)	Adjust calibration of densitometer.
Display	Displays density of sample.

CONTROL OR INDICATOR

FUNCTION



PROBE Read Pushbutton

Enables densitometer to display a reading.

Light Switch

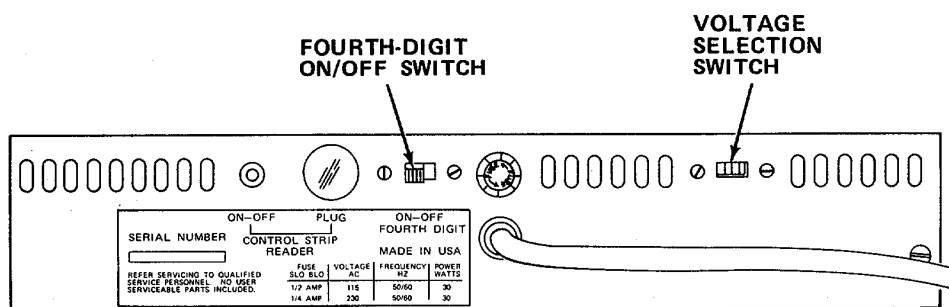
Turns ON or OFF the internal fluorescent lamps which illuminate the transmission probe light table.

Probe Base

Stabilizes probe.

Target

Provides aiming point for readings.



FOURTH-DIGIT ON/OFF Switch

Turns on or off fourth-digit in readout.

Voltage Selection Switch

Selects 115 V ac or 220 V ac operation.

7-5. OPERATOR'S 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.

7-5.1 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 column. 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:

<u>Item</u>	<u>Quantitv</u>
Cheesecloth (Item 14, Appendix E)	ar
Detergent (Item 16, Appendix E)	ar
Lens Brush	1

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.

Table 7-1. OPERATOR'S PREVENTIVE MAINTENANCE CHECKS AND SERVICES

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:
1	B	<p><u>DENSITOMETER.</u></p> <p><u>Inspect.</u></p> <ol style="list-style-type: none"> 1. Unplug power cord. 2. Inspect power cord for cuts, cracks, or broken plug. 3. Inspect chassis cover for dents, scratches, or damaged condition. 4. Inspect for missing or broken knobs or switches. 	<p>Power cord has cuts, cracks, or broken plug.</p> <p>Missing or broken knobs or switches.</p>
2	B	<p><u>Service.</u></p> <p>Clean densitometer using cheesecloth dampened with mild detergent and warm water.</p>	
3	B	<p><u>REFLECTION PROBE.</u></p> <p><u>Inspect.</u></p> <ol style="list-style-type: none"> 1. Inspect bottom of reflection probe base for damage or accumulation of dirt. 2. Inspect target area of probe base for lint or dust. 3. Unplug probe from densitometer. 	<p>Bottom of reflection probe base is damaged.</p>

Table 7-1. OPERATOR'S PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

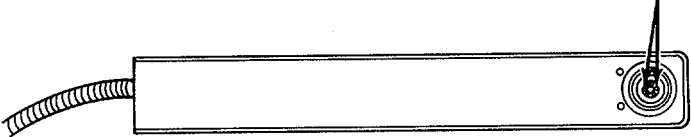
AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
3	B	<p><u>REFLECTION PROBE - Cont</u></p> <p>Inspect - Cont</p> <p>4. Inspect probe cable for cuts, cracks, bent or broken pins.</p> <div style="text-align: center;"> </div>	<p>Probe cable has cuts, cracks, bent or broken pins.</p>
4	B	<p style="text-align: center;"><u>CAUTION</u></p> <p>Do not use solvents on probe tip. Serious damage to fiber optic system may occur.</p> <p>Service.</p> <ol style="list-style-type: none"> 1. With cheesecloth or lens brush, clean fiber optic sensors. 2. Clean bottom of probe base with slightly damp cheesecloth. 3. Clean lint and dust from target area. 	

Table 7-1. OPERATOR'S 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:
5	B	<p><u>TRANSMISSION PROBE.</u></p> <p><u>Inspect.</u></p> <ol style="list-style-type: none"> 1. Unplug probe from power outlet and densitometer. 2. Inspect probe tip located on end of moving arm for damage and accumulation of dirt. 3. Inspect power cord for cuts, cracks, or broken plug. 4. Inspect probe cable for cuts, cracks, bent or broken pins. 5. Inspect glass surface for scratches or cracks. 	<p>Probe tip is damaged.</p> <p>Power cable has cuts, cracks, or broken plug.</p> <p>Probe cord has cuts, cracks, bent or broken pins.</p> <p>Glass surface has cracks.</p>
6	B	<p><u>Service.</u></p> <div style="text-align: right; margin-bottom: 10px;"> <p>FIBER OPTIC SENSORS</p>  </div> <ol style="list-style-type: none"> 1. With cheesecloth or lens brush, clean fiber optic sensors. 2. Clean bottom of probe base with slightly damp cheesecloth. 3. Clean table surface with slightly damp cheesecloth. 	

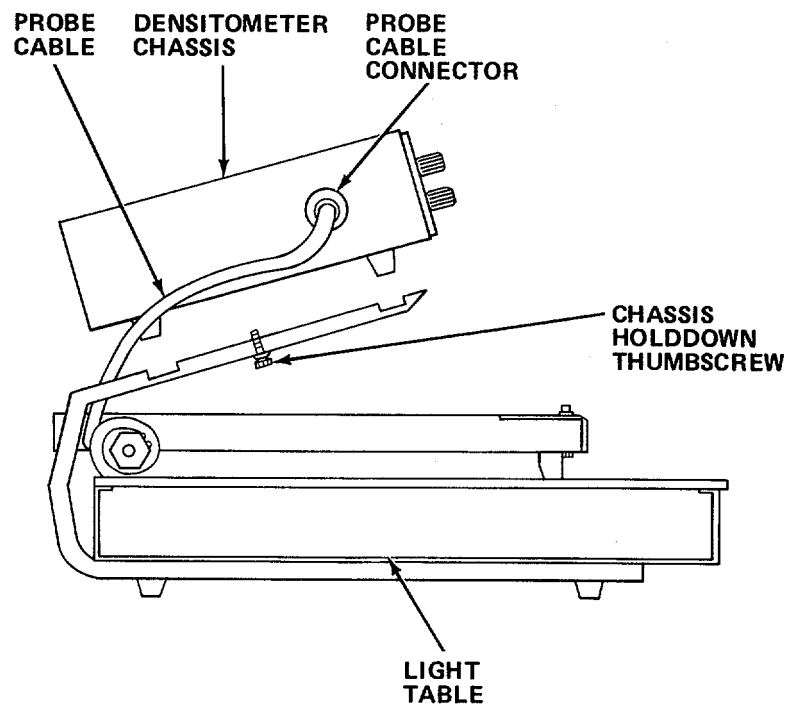
7-6. OPERATION UNDER USUAL CONDITIONS.

7-6.1 Assembly and Preparation for Use.

CAUTION

Be sure correct voltage is selected prior to applying power or serious damage to equipment may occur.

- a. Be sure voltage selection switch on rear panel is set to correct position for power available.



- b. Plug in light table and densitometer power cord.
- c. Plug in reflection/transmission probe cable.

NOTE

For the highest possible accuracy, the densitometer should be turned on and allowed to reach normal operating temperature (one half hour or more) before use.

- d. Set POWER switch on densitometer and light table to ON position.
- e. Be sure digital display, light table lamps, transmission probe lamp, and reflection probe lamp light.

7-6.2 Initial Adjustments, Daily Checks, and Self Test. Initial (daily) preparation check.

NOTE

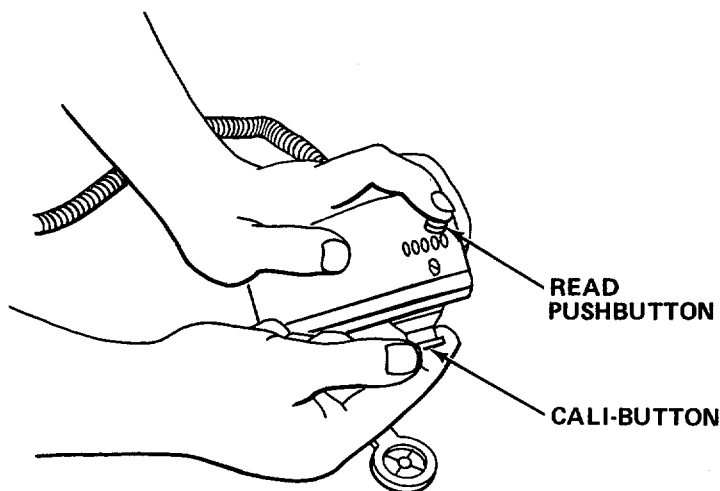
For the highest possible accuracy, the densitometer should be turned ON and allowed to reach normal operating temperatures (one-half hour or more) before performing this adjustment.

- a. Turn on densitometer.

NOTE

If densitometer is to be used with the transmission probe, proceed to step d.

- b. Connect reflection probe to densitometer.
- c. Adjust densitometer for use with reflection probe.



- (1) Place fourth-digit ON/OFF switch to ON position.
- (2) Place white cali-button in probe tip.

NOTE

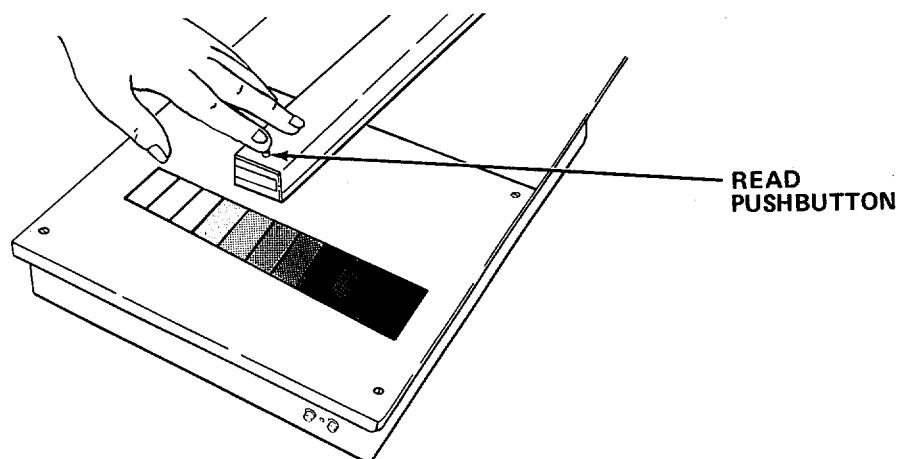
Base and target are not used with this procedure.

- (3) Press read pushbutton and read display.

NOTE

If a minus sign appears before 0.000, turn zero control knob until minus sign disappears.

- (4) Adjust ZERO control knob of channel selected until a reading of 0.000 is obtained.
 - (5) Repeat step c for each channel position.
 - (6) Place CHANNEL control switch in the cyan-colored position.
 - (7) Place cyan-colored cali-button in probe tip.
 - (8) Press read pushbutton.
 - (9) If necessary, adjust SLOPE control with special screwdriver provided, so that display shows reading recorded on cali-button case top.
 - (10) Repeat step 6 thru 9 for each of the three remaining colors. Change cali-button as required.
- d. Adjust densitometer for use with the transmission probe.



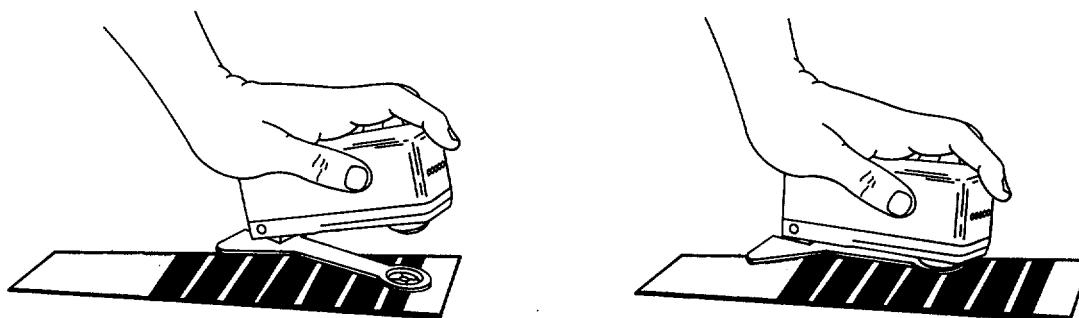
- (1) Connect transmission probe to densitometer.
- (2) Connect light table to ac outlet.
- (3) Using desired aperture, center low density step of cali-strip over the light spot.
- (4) Lower reading arm and depress the read pushbutton.

- (5) Adjust the ZERO control knob to obtain this density in all filter positions.
- (6) Using desired aperture, center high density step of cali-strip over light spot.
- (7) Lower reading arm and depress the read pushbutton.
- (8) Adjust the SLOPE control to obtain this density in all filter positions.

7-6.3 Operating Procedures.

NOTE

When switching probes, the calibration procedure for the probe selected must be performed prior to operation.



a. Reflection Probe.

- (1) Place probe on area of unknown density of sample or copy.
- (2) Center desired area.
- (3) Press upper portion of probe downward.
- (4) Press and hold read pushbutton until a reading is obtained on the digital readout. If desired, move probe or sample around, while holding the read pushbutton to obtain maximum and minimum values.

NOTE

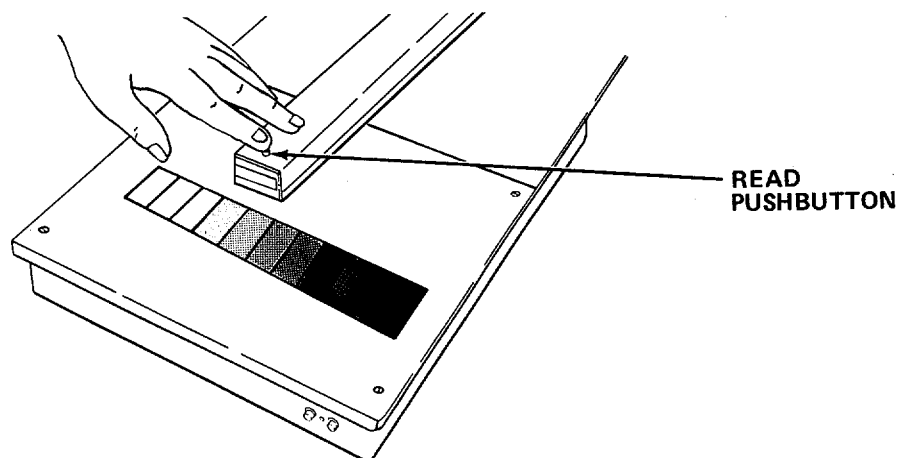
The digital readout will automatically hold and display the last measured value when the read pushbutton is released.

- (5) Release read pushbutton when desired reading is obtained.

b. Transmission Probe.

NOTE

When switching probes, the calibration procedure for the probe selected must be performed prior to operation.



- (1) Locate the desired area of negative over the lighted aperture.
- (2) Center desired area.
- (3) Press upper portion of probe downward.
- (4) Press and hold read pushbutton until a reading is obtained on the digital readout. If desired, move probe or sample around, while holding the read pushbutton to obtain maximum and minimum values.

NOTE

The digital readout will automatically hold and display the last measured value when the read pushbutton is released.

- (5) Release read pushbutton when desired reading is obtained.

7-6.4 Preparation for Movement.

- a. Turn densitometer and probe OFF.
- b. Unplug densitometer power cord.
- c. Unplug transmission probe power cord.

- d. Unplug reflection probe/transmission probe.
- e. Place reflection probe in designated storage cabinet.

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

Section III. OPERATOR MAINTENANCE

7-8. LUBRICATION INSTRUCTIONS . This equipment does not require lubrication.

7-9. TROUBLESHOOTING PROCEDURES.

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

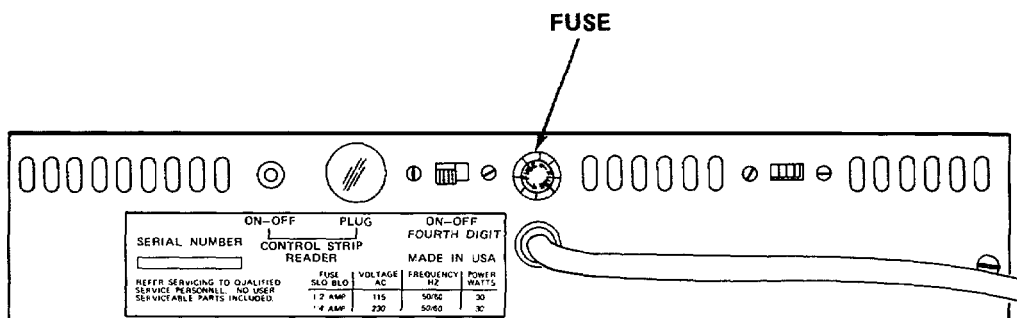
b. This manual cannot list all malfunctions that may occur, nor all test or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

Table 7-2. TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

1. DENSITOMETER WILL NOT ENERGIZE.

- Step 1. Check that power cord is plugged in.
 - (a) If power cord is plugged in, proceed to step 2.
 - (b) Connect power cord.
- Step 2. Check position of power panel circuit breaker.
 - (a) If circuit breaker is on, refer to step 3.
 - (b) Reset circuit breaker.



WARNING

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

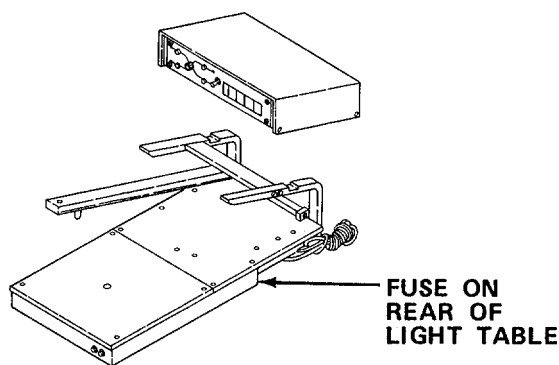
- Step 3. Check for blown fuse.
 - (a) If fuse is not blown, notify your supervisor.
 - (b) Change fuse.

Table 7-2. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

2. TRANSMISSION PROBE LIGHT TABLE WILL NOT LIGHT.

- Step 1. Check that power cord is plugged in.
 - (a) If power cord is plugged in, proceed to step 2.
 - (b) Connect power cord.
- Step 2. Check position of power panel circuit breaker.
 - (a) If circuit breaker is on, refer to step 3.
 - (b) Reset circuit breaker.



WARNING

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

- Step 3. Check for blown fuse.
 - (a) If fuse is not blown, notify supervisor.
 - (b) Change fuse.

7-10. MAINTENANCE PROCEDURES. There are no operator maintenance procedures assigned for this equipment.

7-11. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

7-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT.

7-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

7-12.2 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.

7-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-3610-285-24P covering organizational maintenance for this equipment.

7-13. SERVICE UPON RECEIPT.**7-13.1 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.

Section IV. ORGANIZATIONAL MAINTENANCE

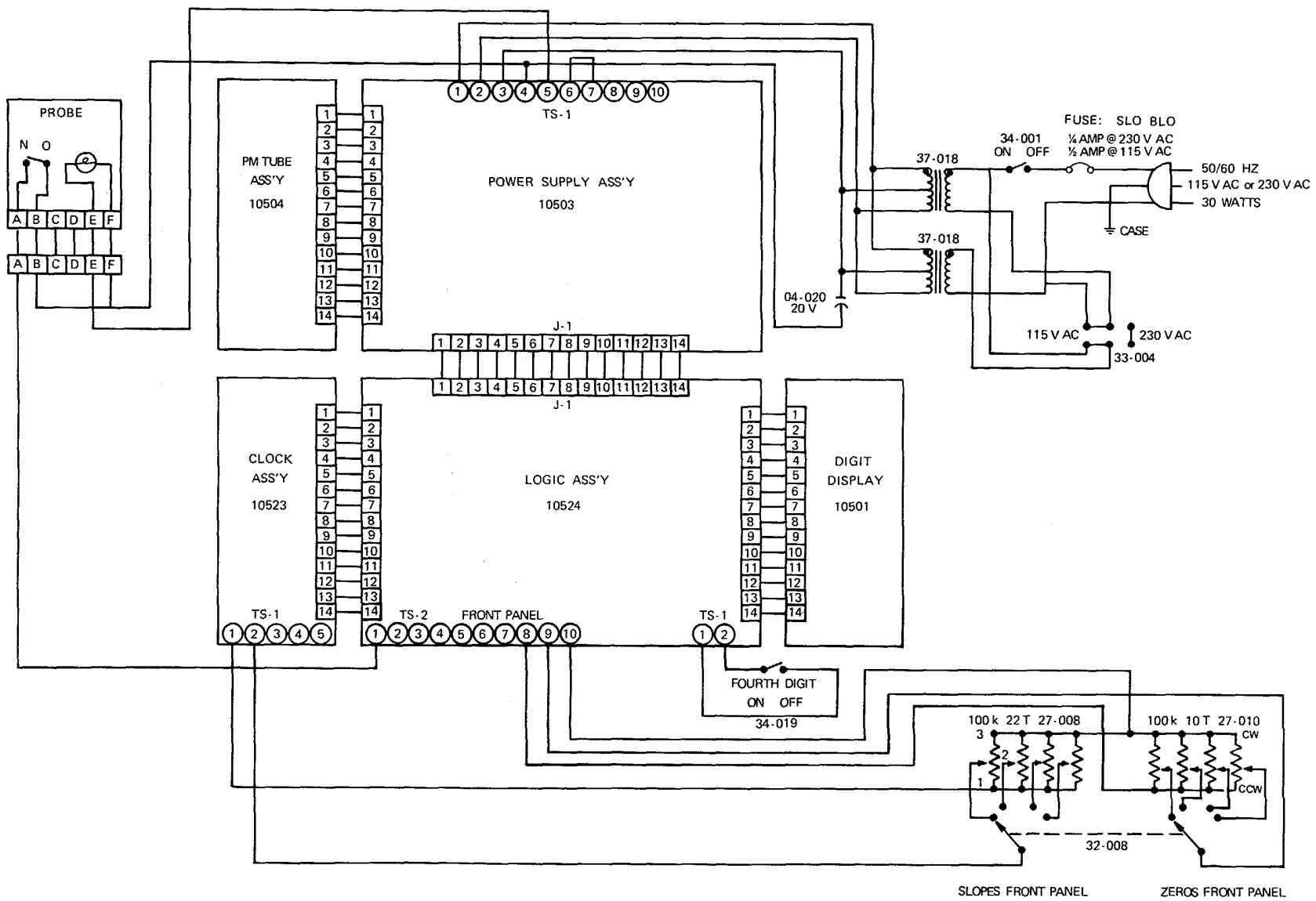
7-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES . There are no organizational PMCS procedures assigned for this equipment.

7-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES.

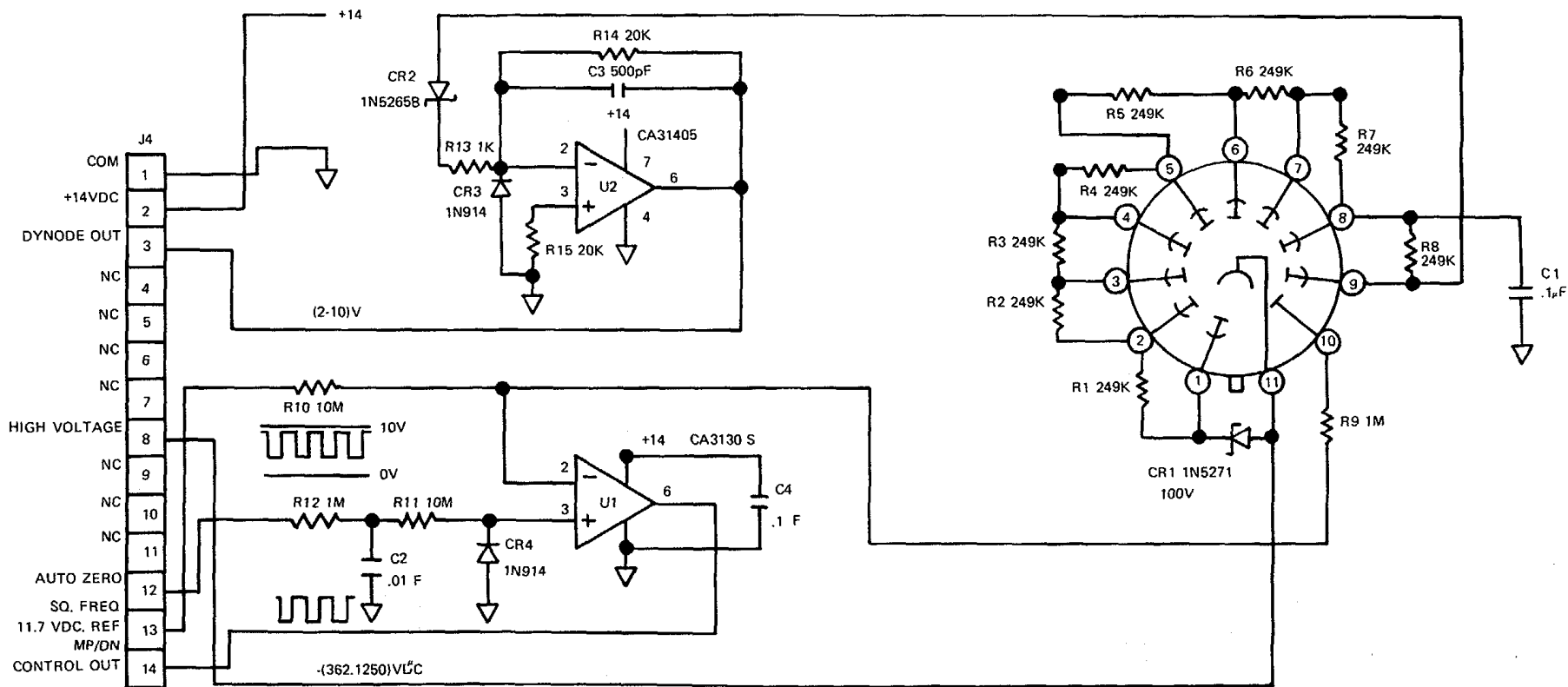
a. Organizational troubleshooting procedures cover the most common malfunctions that may be repaired at the organizational level. Repair or adjustment requiring specialized equipment is not authorized unless such equipment is available. Troubleshooting procedures used by the operator should be conducted 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 is not corrected by a listed corrective action, notify your supervisor.

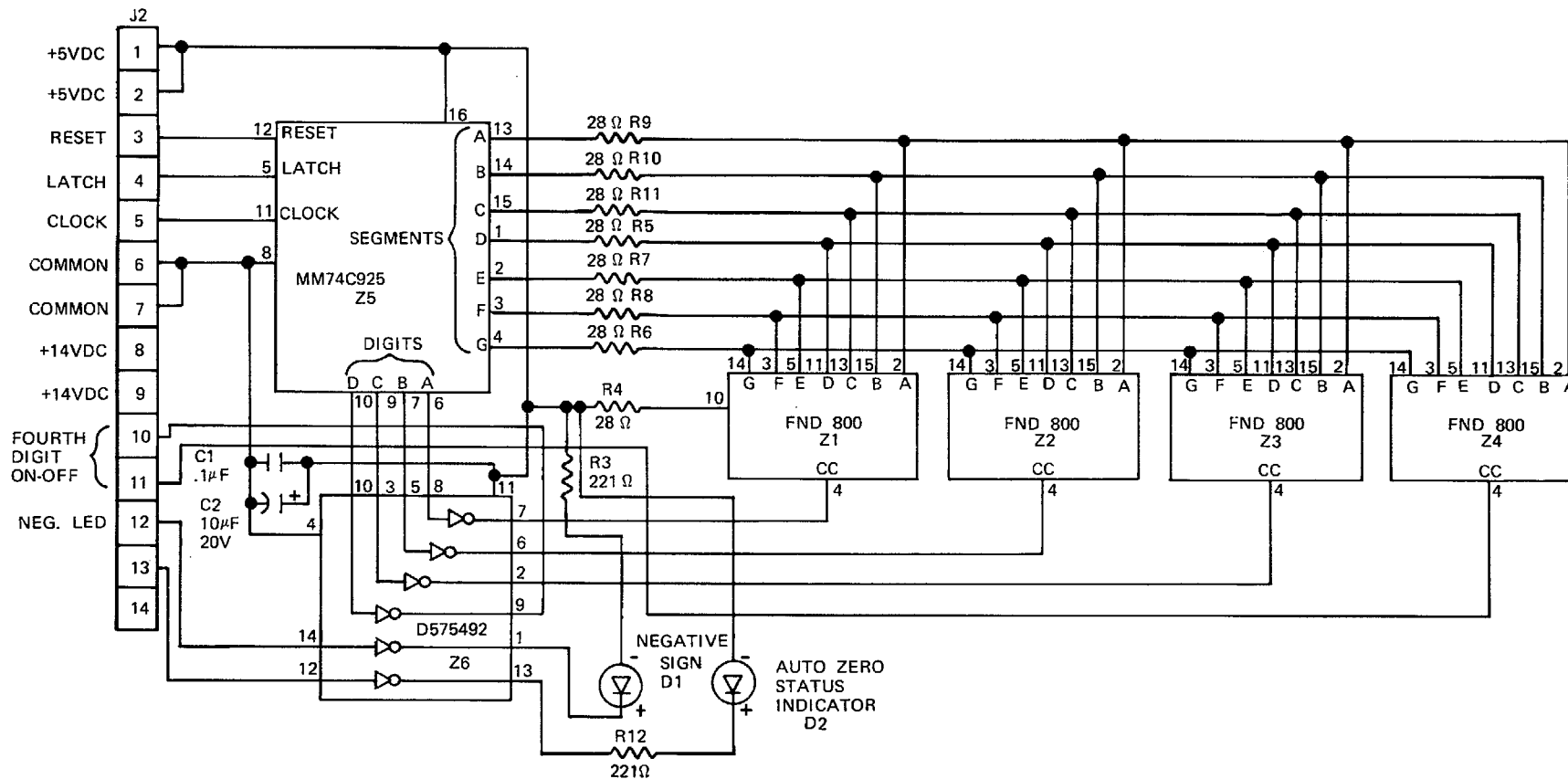
c. For unidentified malfunctions, use the following schematics for further fault analysis.



DIGITAL DENSITOMETER FINAL ASSEMBLY INTERWIRING



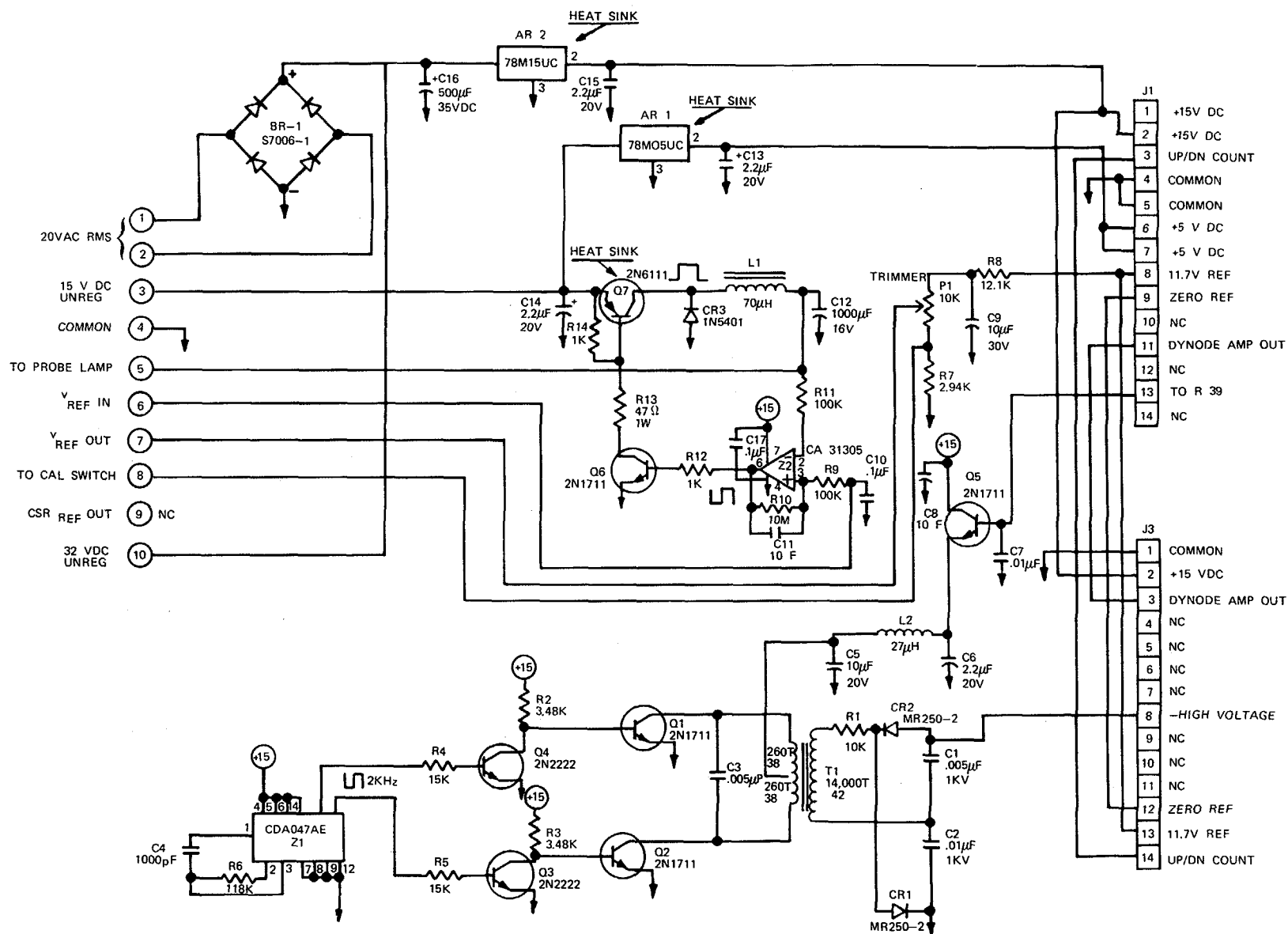
PHOTOMULTIPLIER TUBE PRINTED CIRCUIT BOARD



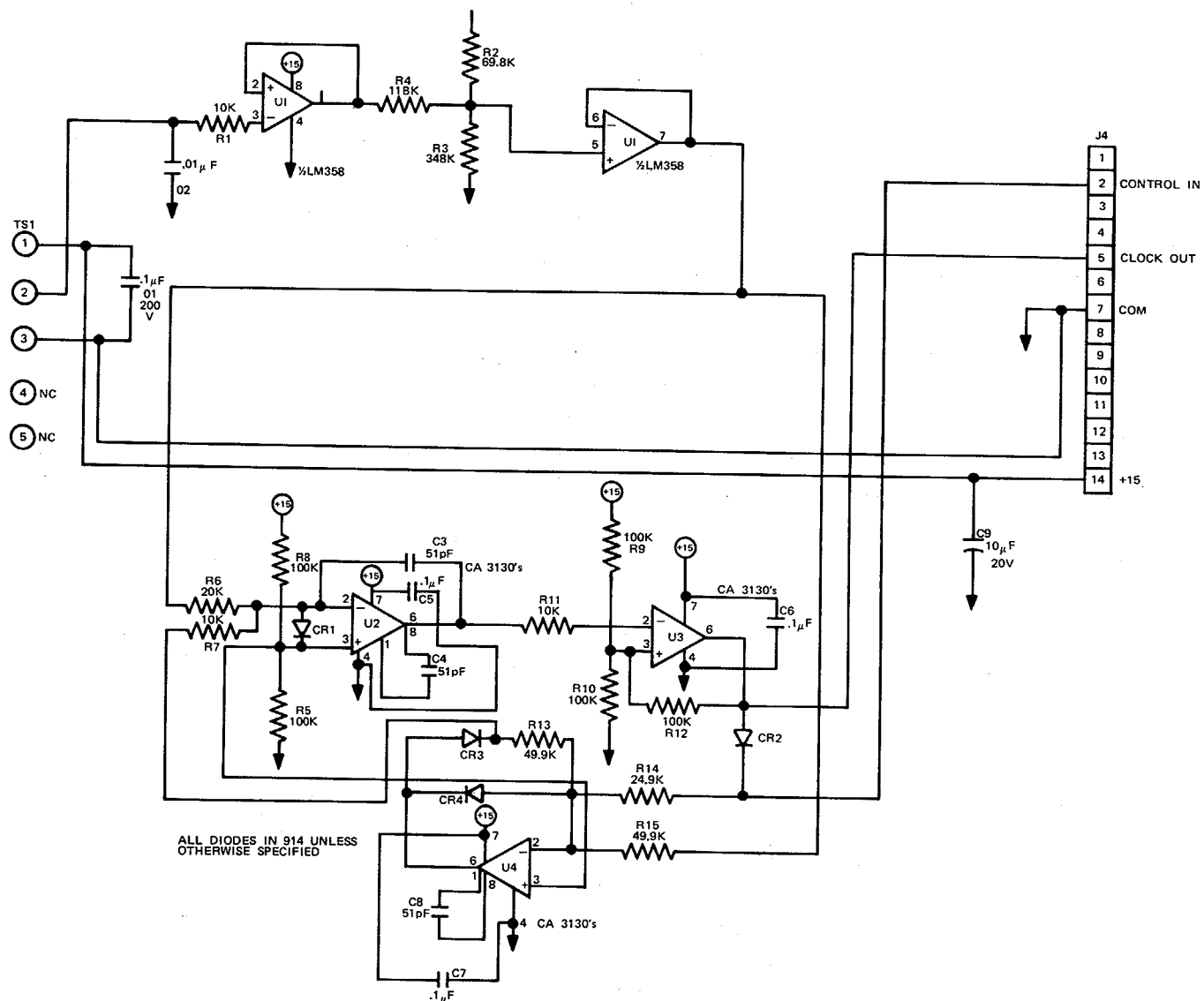
NOTES:

1. ALL RESISTORS RN55D, 1% METAL FILM, ¼ WATT
2. ALL DIODES IN914
3. AUTO ZERO STATUS INDICATOR D2 NOT USED ON D-1.

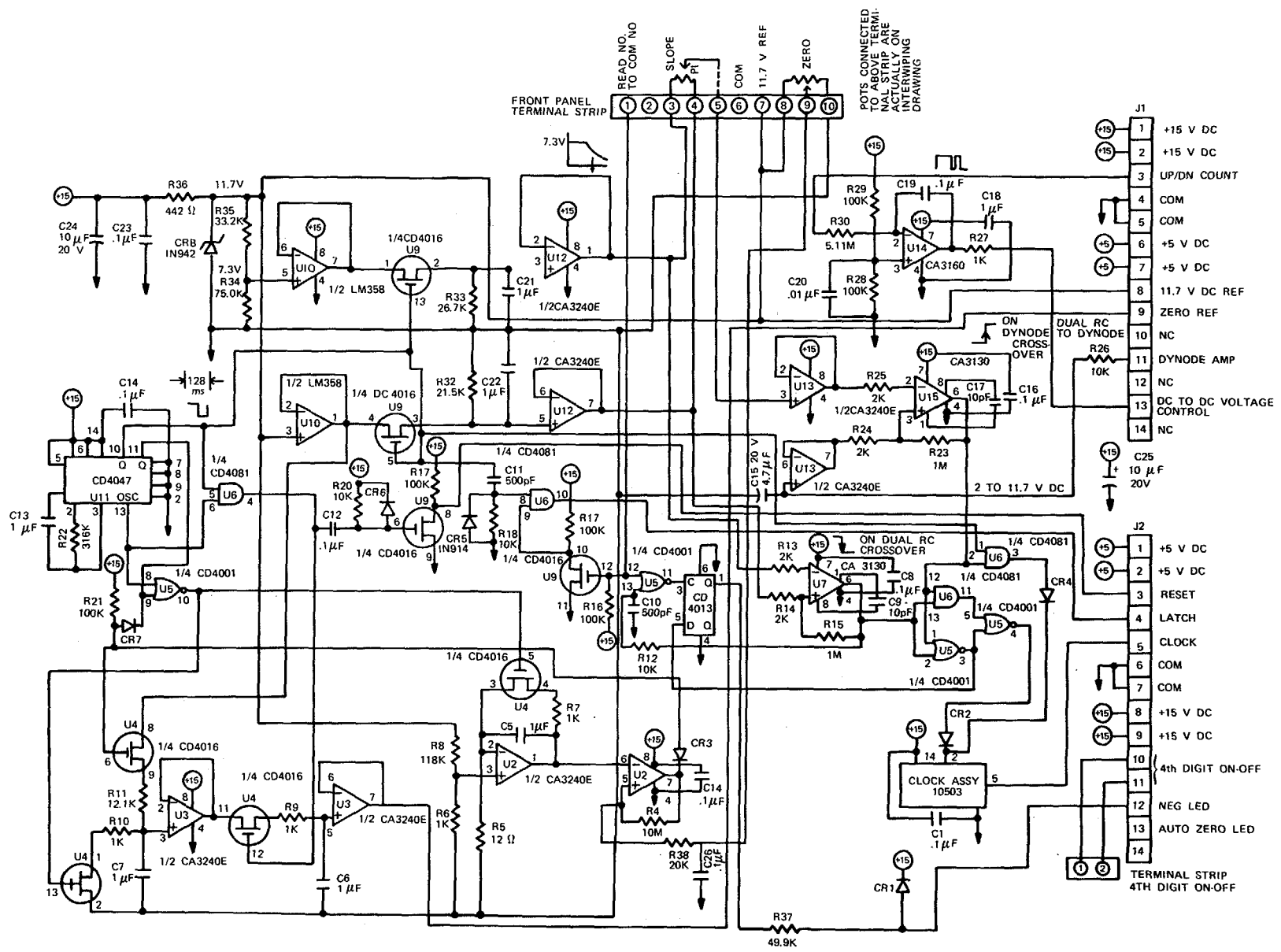
DISPLAY PRINTED CIRCUIT BOARD



POWER SUPPLY PRINTED CIRCUIT BOARD



CLOCK PRINTED CIRCUIT BOARD



LOGIC PRINTED CIRCUIT BOARD

Table 7-3. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. DENSITOMETER WILL NOT ENERGIZE.		
Step 1. Check for power at outlet.		
(a) If power present, proceed to step 2.		
(b) Restore power to outlet.		
Step 2. Check for defective power cord.		
(a) If power cord is not defective, proceed to step 3.		
(b) Replace power cord (paragraph 7-16.11).		
Step 3. Check for defective power switch.		
(a) If power switch is not defective, proceed to step 4.		
(b) If power switch defective, replace switch (paragraph 7-16.5).		
Step 4. Check for defective fuse holder.		
(a) If fuse holder is not defective, proceed to step 5.		
(b) If fuse holder defective, replace fuse holder (paragraph 7- 16.6).		
Step 5. Check for defective power select switch.		
(a) If power select switch is not defective, proceed to step 6.		
(b) If power select switch defective, replace power select switch (paragraph 7-16.9).		
Step 6. Check for defective power transformer.		
(a) If power transformer is not defective, proceed to step 7.		
(b) If power transformer defective, replace transformer (paragraph 7-16.8).		
Step 7. Check for defective power capacitor.		
(a) If power capacitor is not defective, notify supervisor.		

Table 7-3. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. DENSITOMETER WILL NOT ENERGIZE - Cont		(b) If power capacitor defective, replace capacitor (paragraph 7- 16.13).
2. REFLECTION PROBE LAMP WILL NOT LIGHT.		
	Step 1. Check for defective lamp.	
		(a) If lamp not defective, proceed to step 2.
		(b) If lamp defective, replace lamp (paragraph 7-16.2).
	Step 2. Check for broken wires or connection in probe.	
		(a) If wires and connections are intact, proceed to step 3.
		(b) Replace/repair any loose or broken wires.
	Step 3. Check for defective probe connector.	
		(a) If probe connector not defective, notify supervisor.
		(b) If probe connector defective, replace connector (paragraph 7- 16.14).
3. NO RESPONSE TO PROBE READ PUSHBUTTON.		
	Step 1. Check for defective read pushbutton.	
		(a) If pushbutton not defective, proceed to step 2.
		(b) If pushbutton defective, replace pushbutton (paragraph 7-16.4).
	Step 2. Check for defective probe connector.	
		(a) If connector not defective, notify supervisor.
		(b) If connector defective, replace connector (paragraph 7-16.14).

Table 7-3. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
4. ERRATIC OPERATION OF DIGITAL DISPLAY.		
Step 1. Check for defective controls.		
(a) If controls not defective, proceed to step 2.		
(b) If controls defective, replace controls (paragraph 7-16.7 or 7- 16.10).		
Step 2. Check for defective filter.		
(a) If filter not defective, notify supervisor.		
(b) If filter defective, replace filter (paragraph 7-16.3).		
5. TRANSMISSION PROBE LAMP WILL NOT ENERGIZE.		
Step 1. Check for power at outlet.		
(a) If power present, proceed to step 2.		
(b) Restore power to outlet.		
Step 2. Check for defective power cord.		
(a) If power cord not defective, proceed to step 3.		
(b) If power cord defective, replace power cord (paragraph 7- 16.11).		
Step 3. Check for defective fuse.		
(a) If fuse not defective, proceed to step 4.		
(b) If fuse defective, replace fuse.		
Step 4. Check for defective ON/OFF switch.		
(a) If ON/OFF switch not defective, proceed to step 5.		
(b) If ON/OFF switch defective, replace power switch (paragraph 7- 16.15).		

Table 7-3. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
5. TRANSMISSION PROBE LAMP WILL NOT ENERGIZE - Cont	Step 5. Check for defective lamp.	<ul style="list-style-type: none"> (a) If lamp not defective, notify supervisor. (b) If lamp defective, replace lamp (paragraph 7-16.1). (c) Aline transmission probe optical system (paragraph 7-16.17).
6. DIGITAL DISPLAY DOES NOT CHANGE WHEN CHANNEL CONTROL SWITCH IS ROTATED.	Loosen channel control switch knob.	Tighten knob.
7. NO DIGITAL DISPLAY OF FOURTH DIGIT WITH FOURTH-DIGIT ON/OFF SWITCH IN ON POSITION.	Defective fourth-digit ON/OFF switch.	Replace fourth-digit ON/OFF switch (paragraph 7-16.12).
8. DIFFICULT TO ZERO ADJUST REFLECTION PROBE WITH WHITE CALL-BUTTON INSTALLED.	Reflection probe optical system out of alinement.	Aline reflection probe optical system (paragraph 7-16.18).
9. TRANSMISSION PROBE LIGHT TABLE WILL NOT ENERGIZE.	Step 1. Check for power at outlet.	<ul style="list-style-type: none"> (a) If power present, proceed to step 2. (b) If power not present, restore power to outlet.
	Step 2. Check for defective power cord.	(a) If power cord not defective, proceed to step 3.

Table 7-3. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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9. TRANSMISSION PROBE LIGHT TABLE WILL NOT ENERGIZE - Cont

(b) If power cord defective, replace power cord (paragraph 7-16.11).

Step 3. Check for defective fuse.

(a) If fuse not defective, proceed to step 4.

(b) If fuse defective, replace fuse.

Step 4. Check for defective ON/OFF switch.

(a) If ON/OFF switch not defective, proceed to step 5.

(b) If ON/OFF switch defective, replace ON/OFF switch (paragraph 7-16.15).

Step 5. Check for defective fluorescent lamps.

(a) If lamps not defective, notify supervisor.

(b) If lamps defective, replace lamps (paragraph 7-16.16).

7-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the digital densitometer. 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

PROCEDURES	PARAGRAPH
Replace Transmission Probe Lamp	7-16.1
Replace Reflection Probe Lamp	7-16.2
Replace Filter	7-16.3
Replace Read Pushbutton.....	7-16.4
Replace Densitometer Power ON/OFF Switch	7-16.5
Replace Fuse Holder	7-16.6
Replace Zero Control	7-16.7
Replace Transformer	7-16.8
Replace Voltage Selection Switch	7-16.9
Replace Slope Control	7-16.10
Replace Power Cord	7-16.11
Replace Fourth-Digit ON/OFF Switch.....	7-16.12
Replace Capacitor.....	7-16.13
Replace Probe Connector	7-16.14
Replace Transmission Probe Light Table ON/OFF Switch	7-16.15
Replace Transmission Probe Table Fluorescent Lamps	7-16.16
Aline Transmission Probe Optical System	7-16.17
Aline Reflection Probe Optical System	7-16.18
Remove/Install Transmission Probe on Folding Table	7-16.19

7-16.1 Replace Transmission Probe Lamp.

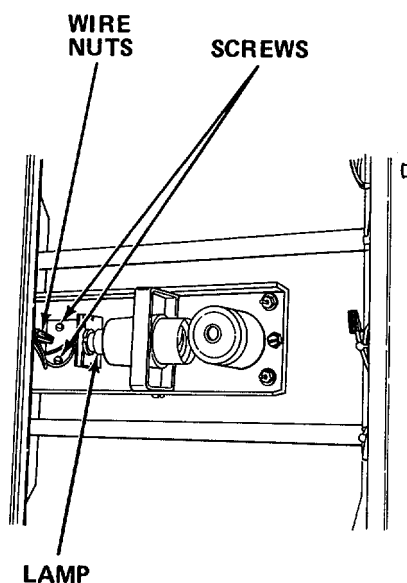
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
Flat Tip ScrewdriverSUPPLIES: Lamp
Wire Nuts**WARNING**

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

- a. Unplug power cord.



- b. Remove plastic table platen.
- c. Remove screws holding lamp in place.
- d. Carefully remove lamp and bracket until two wire nuts on lamp are accessible.
- e. Remove wire nuts.
- f. Remove lamp.
- g. Connect new lamp, being careful to observe wire colors.

- h. Install wire nuts.
- i. Push wires back into hole in lamp mounting block.
- j. Secure lamp with screws after checking alinement (paragraph 7-16.17).
- k. Reinstall plastic table platen.
- l. Plug in power cord.

7-16.2 Replace Reflection Probe Lamp.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

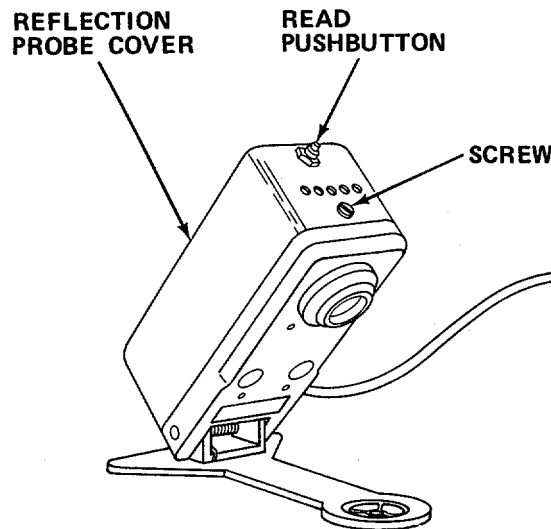
Tool Kit, Light Machine Repair
Flat Tip Screwdriver

SUPPLIES: Lamp
Wire Nuts

WARNING

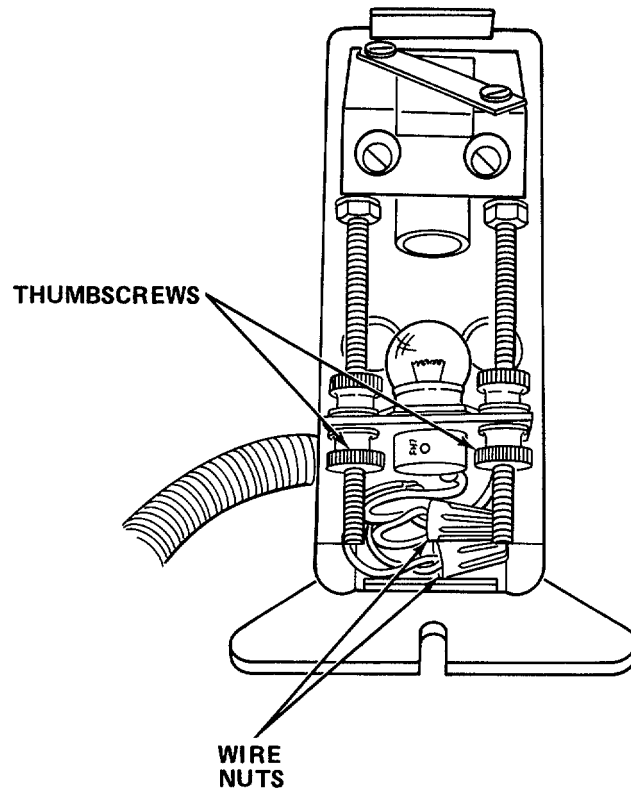
Death or serious injury may occur from electrical shock unless power cord is unplugged before repairing equipment.

- a. Unplug reflection probe cable.



- b. Remove two screws holding probe housing cover in place.
- c. Remove cover carefully to prevent damage to wires attached to read pushbutton.

- d. Remove wire nuts, and note wire color connections; then disconnect lamp wires.



- e. Remove thumbscrews and lockwashers.
 f. Remove probe lamp.
 g. Install new probe lamp and secure with thumbscrews.
 h. Mate wires by color code and carefully twist wires together and secure with wire nuts.
 i. Reinstall probe housing cover and secure with screws.
 j. Check lamp alignment (paragraph 7-16.18).
 k. Plug in reflection probe cable.

7-16.3 Replace Filter.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

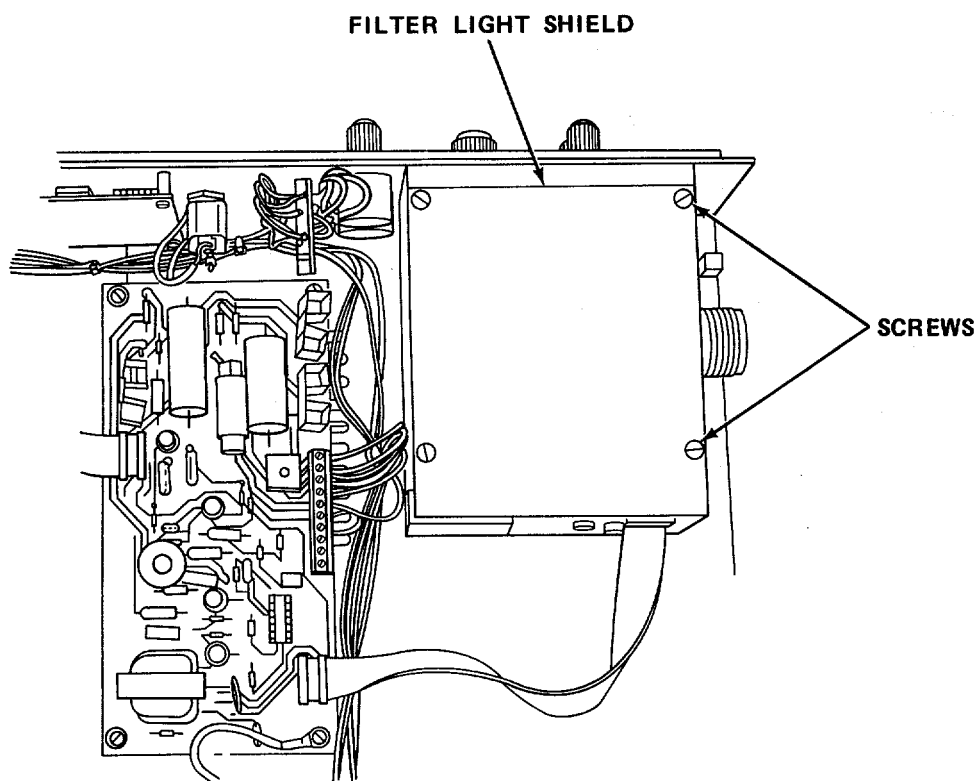
Tool Kit, Light Machine Repair
Flat Tip Screwdriver

SUPPLIES: Filter

WARNING

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

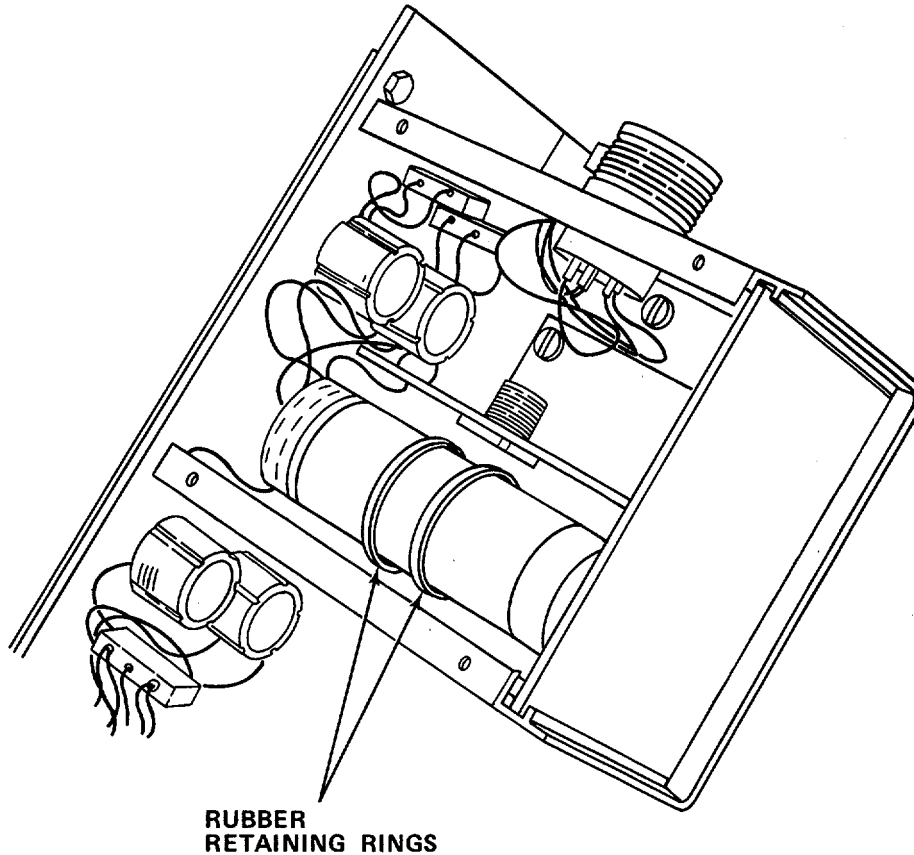
- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.



- d. Remove four screws holding filter light shield in place; remove light shield.

CAUTION

Exercise care that filter is not scratched, and that fingerprints are not left on filter during replacement. A damaged or dirty filter may provide incorrect readings.



- e. Remove defective filter by moving rubber retaining rings away from filter.
- f. Install new filter and secure with retaining rings.
- g. Reinstall light shield and secure with four screws.
- h. Reinstall chassis cover and secure with screws.
- i. Plug in reflection/transmission probe cable.
- j. Plug in power cord.

7-16.4 Replace Read Pushbutton.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

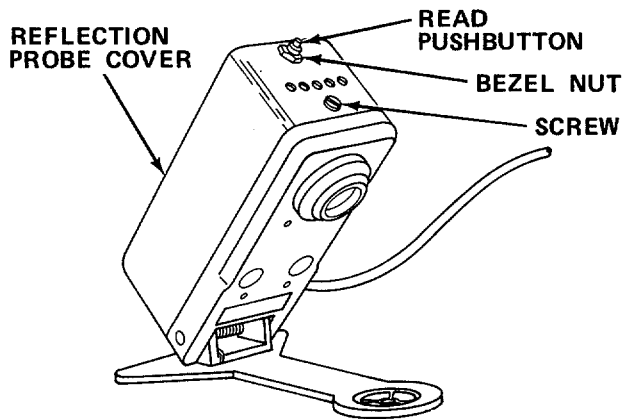
Tool Kit, Electronic Repair
 Flat Tip Screwdriver
 Offset Flat Tip Screwdriver
 Soldering Iron

SUPPLIES: Read Pushbutton
 Solder

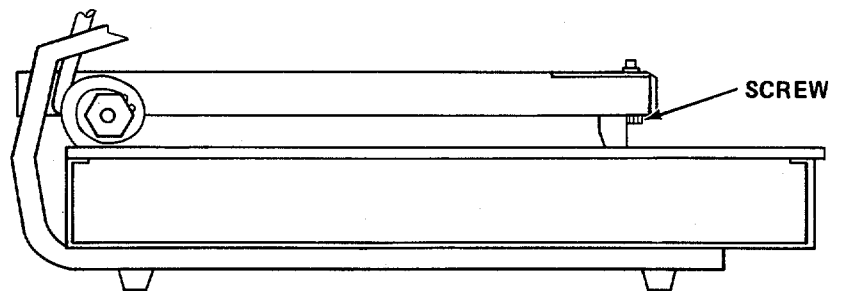
WARNING

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

- a. Unplug transmission probe table power cord if replacing transmission probe read pushbutton.



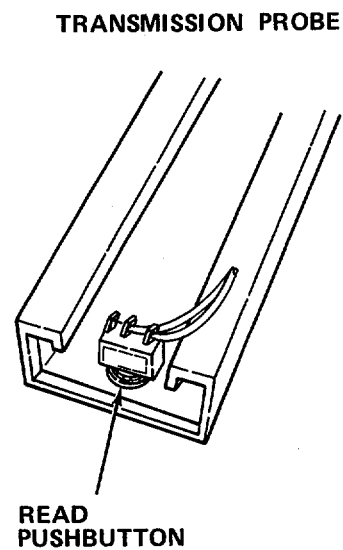
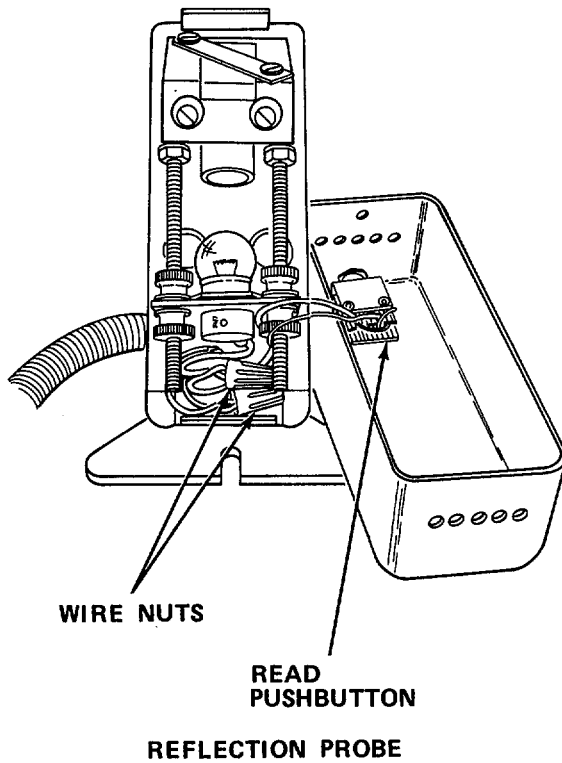
REFLECTION PROBE



TRANSMISSION PROBE

- b. Unplug reflection/transmission probe cable.
- c. Remove cover screws and bezel nut, and remove cover.

- d. Tag and desolder wires from read pushbutton.



- e. Replace defective read pushbutton.
 f. Solder wires to new read pushbutton.
 g. Install new pushbutton and secure with bezel nut.
 h. Reinstall probe cover to housing with screws.
 i. Plug in reflection/transmission probe cable.
 j. Plug in power cord.

7-16.5 Replace Densitometer Power ON/OFF Switch.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

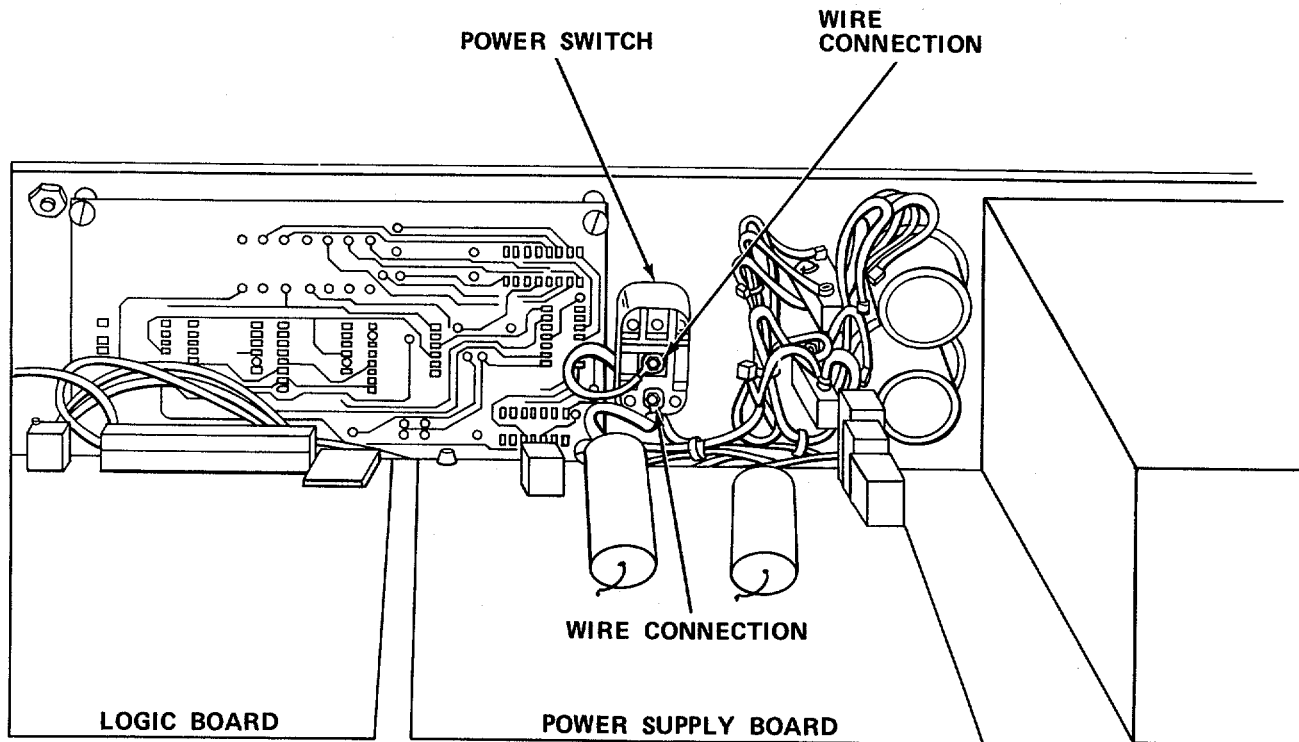
Tool Kit, Electronic Repair
 Flat Tip Screwdriver
 Soldering Iron

SUPPLIES: POWER ON/OFF Switch
 Solder

WARNING

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

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.



- d. Tag and desolder wires from POWER switch.
- e. Remove nut securing switch to front panel.
- f. Replace defective switch.
- g. Solder wires to switch.
- h. Reinstall chassis cover and secure with screws.
- i. Plug in reflection/transmission probe cable.
- j. Plug in power cord.

7-16.6 Replace Fuse Holder.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

Tool Kit, Electronic Repair

Flat Tip Screwdriver

Needle Nose Pliers

Soldering Iron

SUPPLIES: Fuse Holder

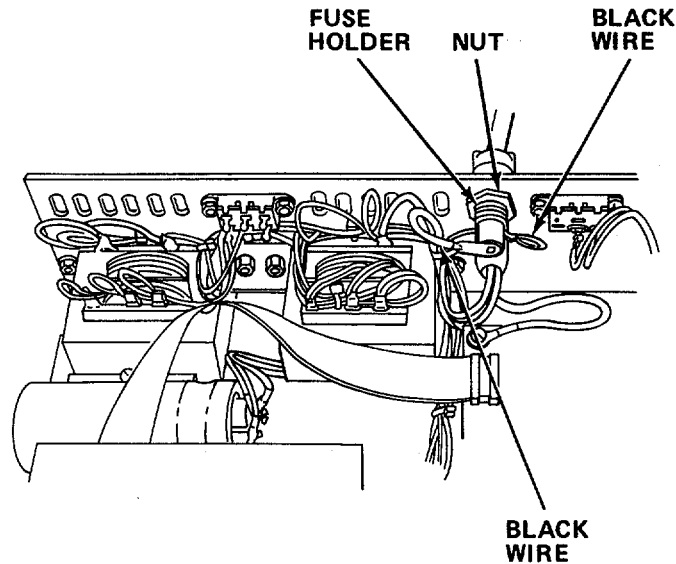
Solder

WARNING

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

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.

- d. Remove fuse.



- e. Tag and desolder wires from fuse holder.
- f. Remove nut securing fuse holder to chassis.
- g. Remove defective fuse holder.
- h. Solder wires to new fuse holder, and secure to chassis with nut.
- i. Reinstall fuse.
- j. Reinstall chassis cover and secure with screws.
- k. Plug in reflection/transmission probe cable.
- l. Plug in power cord.

7-16.7 Replace Zero Control.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

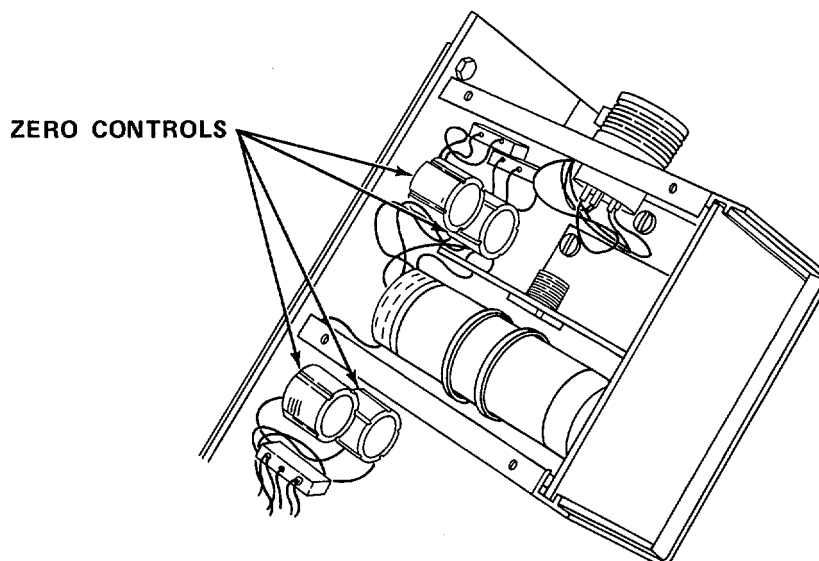
- Tool Kit, Electronic Repair
- Flat Tip Screwdriver
- Needle Nose Pliers
- Hex Head Key Wrench Set
- Soldering Iron

SUPPLIES: Zero Control
Solder

WARNING

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

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.
- d. If ZERO control is under light shield, remove four screws securing filter light shield to chassis; remove light shield.



- e. Remove knob.
- f. Tag and desolder wires from ZERO control.
- g. Remove nut securing ZERO control to chassis.
- h. Remove defective ZERO control.
- i. Solder wires to new ZERO control.
- j. Reinstall knob.
- k. Reinstall light shield (if removed) and secure with screws.
- l. Reinstall chassis cover and secure with screws.
- m. Plug in reflection/transmission probe cable.
- n. Plug in power cord.

7-16.8 Replace Transformer.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

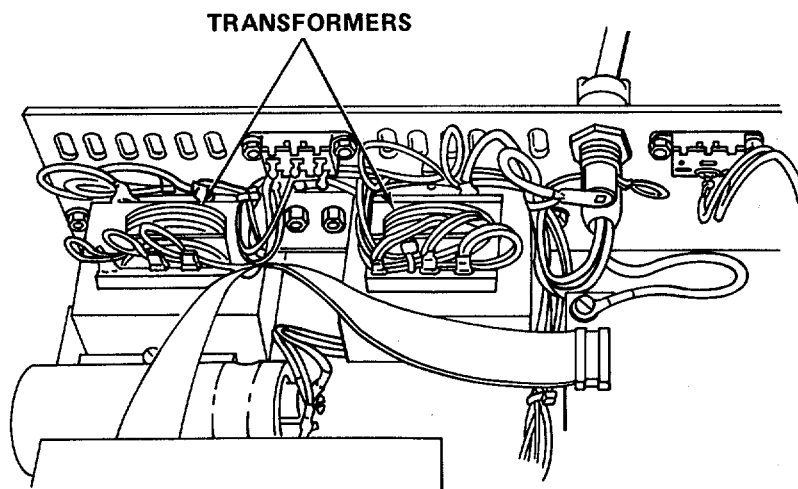
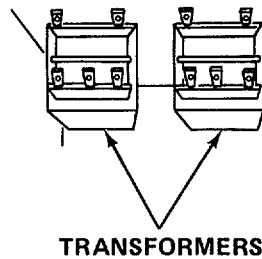
Tool Kit, Electronic Repair
 Flat Tip Screwdriver
 Needle Nose Pliers
 Soldering Iron

SUPPLIES: Transformer
 Solder

WARNING

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

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.



- d. Tag and desolder wires from defective transformer.
- e. Remove screws, nuts, and washers securing transformer to chassis.
- f. Remove defective transformer.
- g. Solder wires to new transformer and secure to chassis with screws, washers and nuts.
- h. Reinstall chassis cover and secure with screws.
- i. Plug in reflection/transmission probe cable.
- j. Plug in power cord.

7-16.9 Replace Voltage Selection Switch.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

Tool Kit, Electronic Repair
 Flat Tip Screwdriver
 Needle Nose Pliers
 Soldering Iron

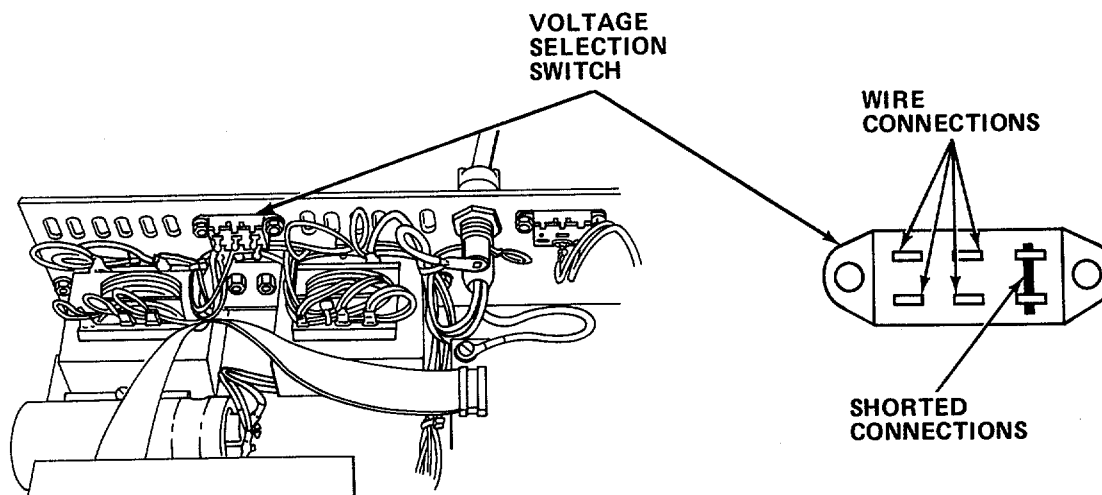
SUPPLIES: Voltage Selection Switch
 Solder

WARNING

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

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.
- d. Tag and desolder wires from voltage selection switch.

- e. Remove screws, nuts, and washers securing voltage selection switch to chassis.



- f. Remove defective voltage selection switch.
- g. Solder wires to new voltage selection switch. Secure to chassis with screws, washers and nuts.
- h. Reinstall chassis cover and secure with screws.
- i. Plug in reflection/transmission probe cable.
- j. Be sure voltage selection switch is in correct position for voltage source.
- k. Plug in power cord.

7-16.10 Replace Slope Control.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

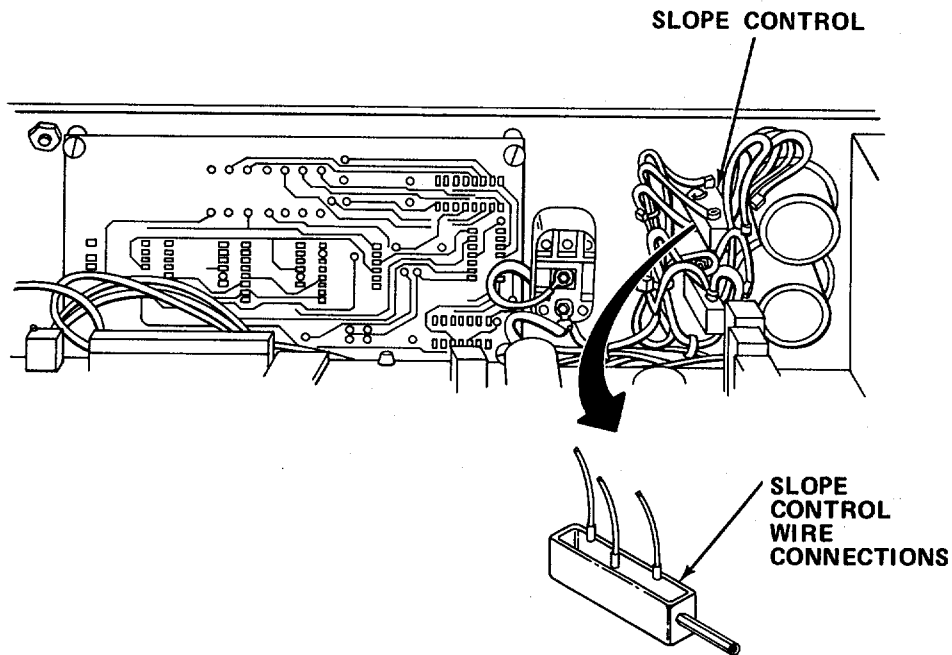
- Tool Kit, Electronic Repair
- Flat Tip Screwdriver
- Needle Nose Pliers
- Soldering Iron

- SUPPLIES: SLOPE Control
Solder

WARNING

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

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.
- d. If SLOPE control is under filter light shield, remove four screws securing filter light shield; remove light shield.
- e. Tag and desolder wires from SLOPE control.
- f. Remove nut securing SLOPE control to chassis.



- g. Remove defective SLOPE control.
- h. Solder wires to new SLOPE control. Install nut securing SLOPE control to chassis.
- i. Reinstall light shield (if removed) and secure with screws.
- j. Reinstall chassis cover and secure with screws.
- k. Plug in reflection/transmission probe cable.
- l. Plug in power cord.

7-16.11 Replace Power Cord.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

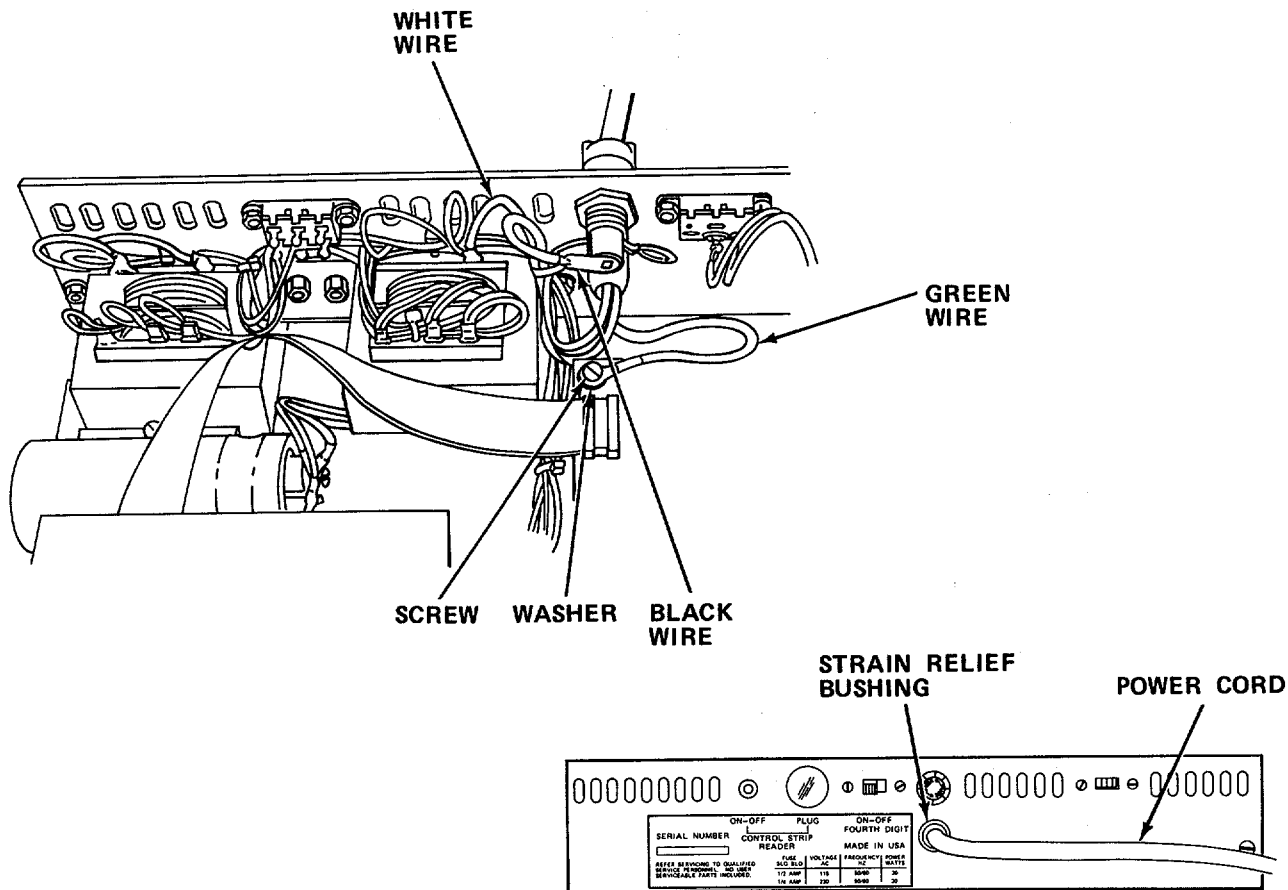
Tool Kit, Electronic Repair
 Flat Tip Screwdriver
 Soldering Iron

SUPPLIES: Power Cord
 Solder

WARNING

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

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.



- d. Note terminal that white wire is attached to and desolder power cord white and black wires.
- e. Remove screw and washer securing green wire to chassis.
- f. Remove and retain strain relief bushing.
- g. Remove defective power cord.
- h. Install new power cord.
- i. Install green wire to chassis with screw and washer.
- j. Solder white wire as noted and black wire to fuse holder.
- k. Reinstall chassis cover and secure with screws.
- l. Plug in reflection/transmission probe cable.
- m. Plug in power cord.

7-16.12 Replace FOURTH-DIGIT ON/OFF Switch.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

Tool Kit, Electronic Repair
 Flat Tip Screwdriver
 Needle Nose Pliers
 Soldering Iron

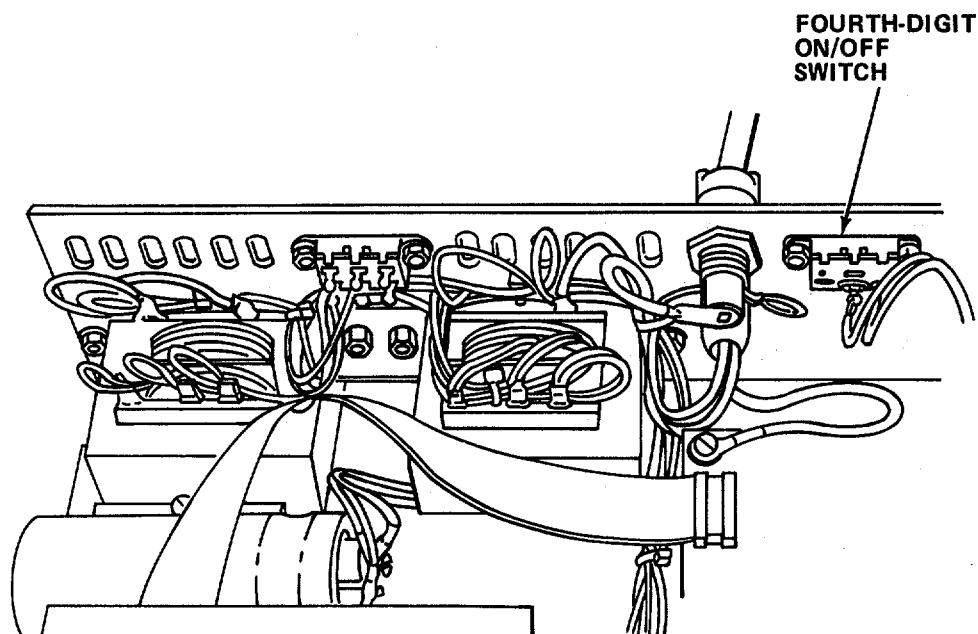
SUPPLIES: FOURTH-DIGIT ON/OFF Switch
 Solder

WARNING

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

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.

- d. Tag and desolder wires from switch.



- e. Remove defective FOURTH-DIGIT ON/OFF switch.
- f. Install new switch, and solder wires to switch.
- g. Reinstall chassis cover and secure with screws.
- h. Plug in reflection/transmission probe cable.
- i. Plug in power cord.

7-16.13 Replace Capacitor.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

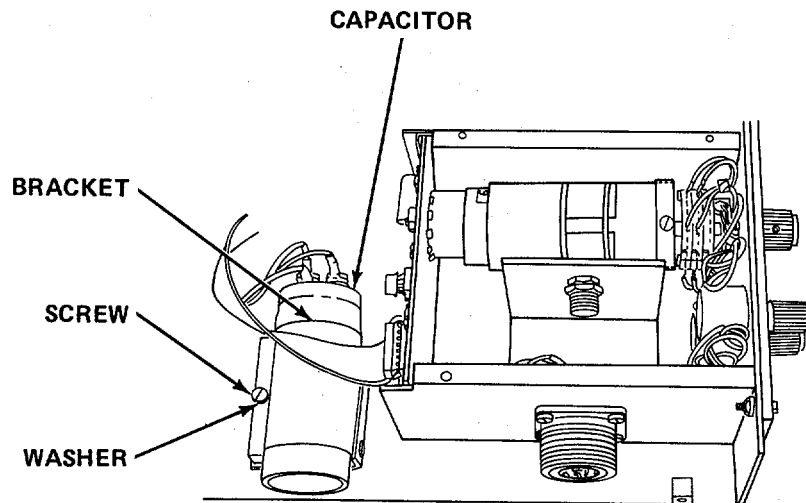
Tool Kit, Electronic Repair
Flat Tip Screwdriver

SUPPLIES: Capacitor

WARNING

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

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.
- d. Tag and disconnect wires from capacitor.
- e. Loosen screw on holding bracket, and remove defective capacitor.



- f. Install new capacitor.
- g. Tighten screw on holding bracket.
- h. Reconnect wires to capacitor.
- i. Reinstall chassis cover and secure with screws.
- j. Plug in reflection/transmission probe cable.
- k. Plug in power cord.

7-16.14 Replace Connector.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

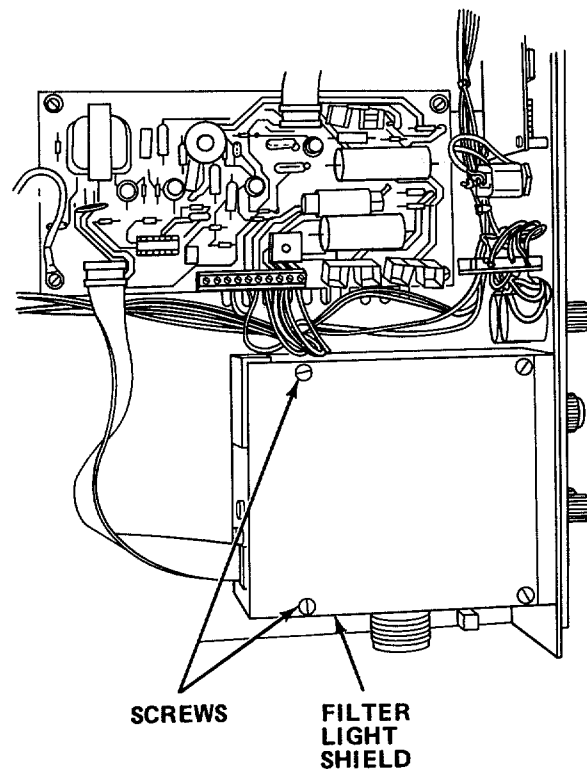
Tool Kit, Electronic Repair
Flat Tip Screwdriver
Nut Driver Set
Soldering Iron

SUPPLIES: Connector
Solder

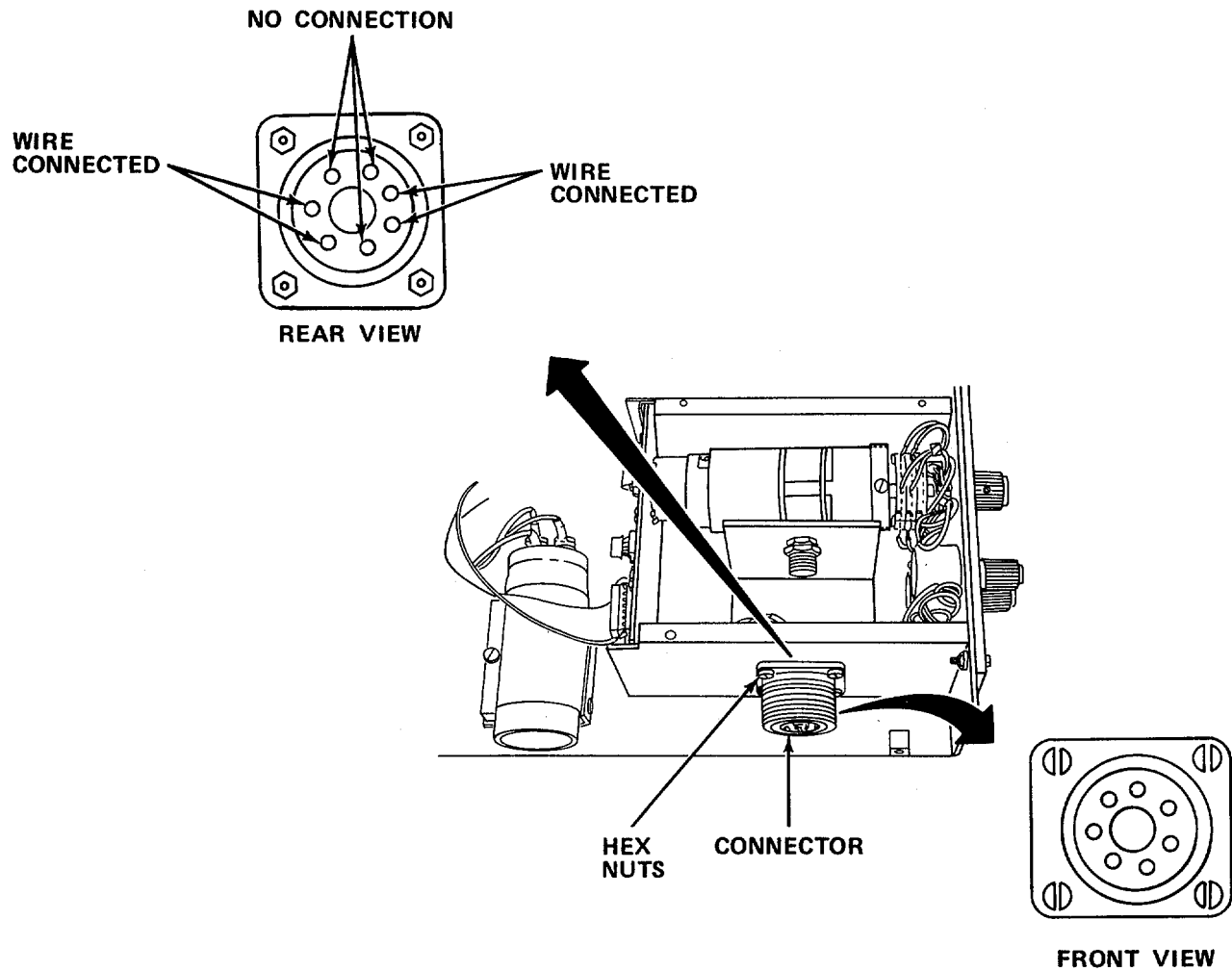
WARNING

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

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.
- d. Remove filter light shield mount screws and remove shield.



e. Tag and desolder wires from connector. Remove defective connector.



- f. Install new connector.
- g. Solder wires to the connector.
- h. Reinstall filter light shield.
- i. Reinstall chassis cover and secure with screws.
- j. Plug in reflection/transmission probe cable.
- k. Plug in power cord.

7-16.15 Replace Transmission Probe Light Table ON/OFF Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair

Flat Tip Screwdriver

SUPPLIES: ON/OFF Switch

WARNING

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

- a. Unplug power cord.
- b. Remove plastic table platen.
- c. Remove screw holding ON/OFF switch and position switch for removal of wires.
- d. Tag and disconnect wires from switch.
- e. Connect wires to new switch, and remove tags.
- f. Install new switch with screw.
- g. Install plastic table platen.
- h. Plug in power cord.

7-16.16 Replace Transmission Probe Table Fluorescent Lamp(s).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair

Flat Tip Screwdriver

Wire Cutters, Diagonals

SUPPLIES: Lamp(s)

Plastic Wire Ties

WARNING

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

- a. Unplug power cord and probe.
- b. Remove plastic table platen.
- c. Remove plastic wire ties securing lamps to lamp holders.
- d. Remove lamp(s).
- e. Install new lamp(s).
- f. Install new plastic wire ties.
- g. Install plastic table platen.
- h. Plug in power cord and probe.

7-16.17. Aline Transmission Probe Optical System.

MOS: 83FJ6, Reproduction Equipment Repairer

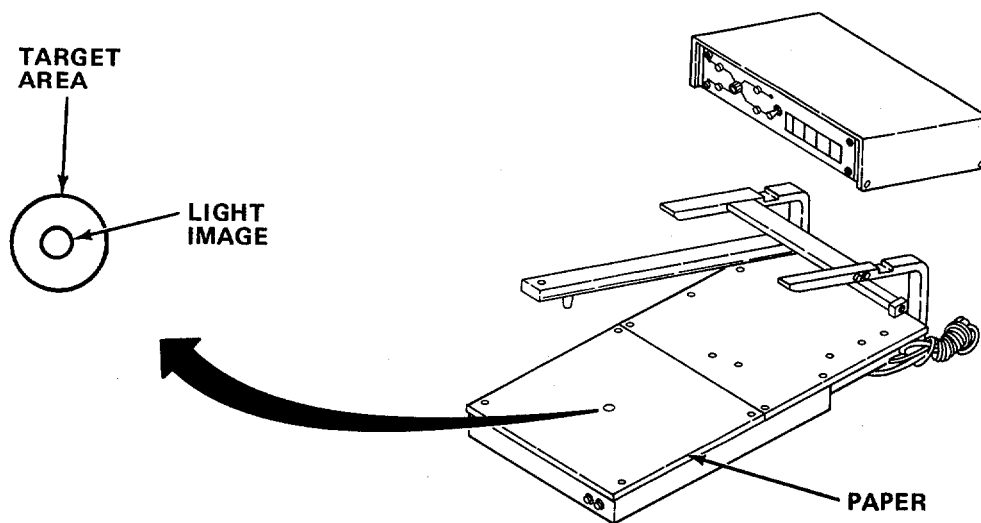
TOOLS:

Tool Kit, Light Machine Repair

Flat Tip Screwdriver

Nut Driver Set

- a. Install smallest aperture assembly.
- b. Move densitometer power switch to ON position.
- c. Place a piece of translucent white paper over target area.



- d. If a focused image of filament appears, no alinement is necessary.

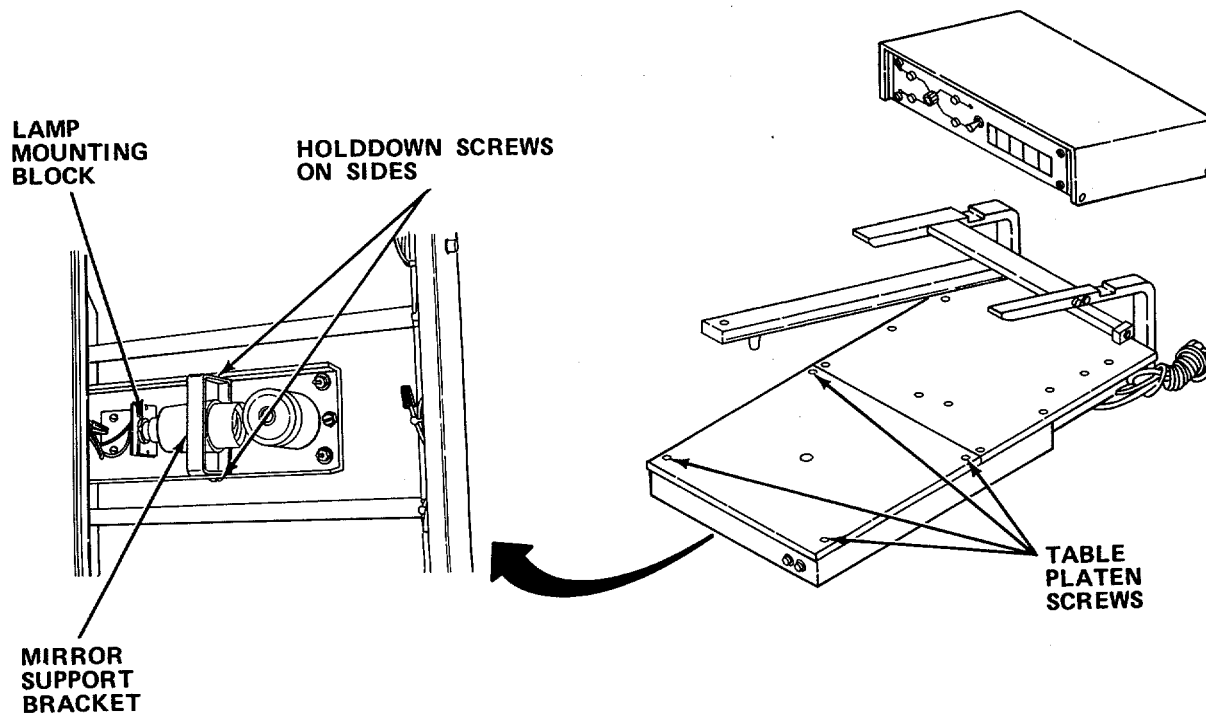
WARNING

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

NOTE

Aperture assembly should remain in place on the clear aperture support tube.

- e. Remove table platen.



NOTE

The optical system is alined by tilting the lamp mounting block and/or rotating the mirror support bracket.

- f. If mirror support must be turned, temporarily insert a screw into the pressed-in nut to prevent unintentional turning; then turn mirror support to desired position.
- g. If bracket support must be turned, turn bracket to desired position.
- h. Secure light table platen with screws.
- i. Recheck lamp alinement.

7-16.18 Aline Reflection Probe Optical System.

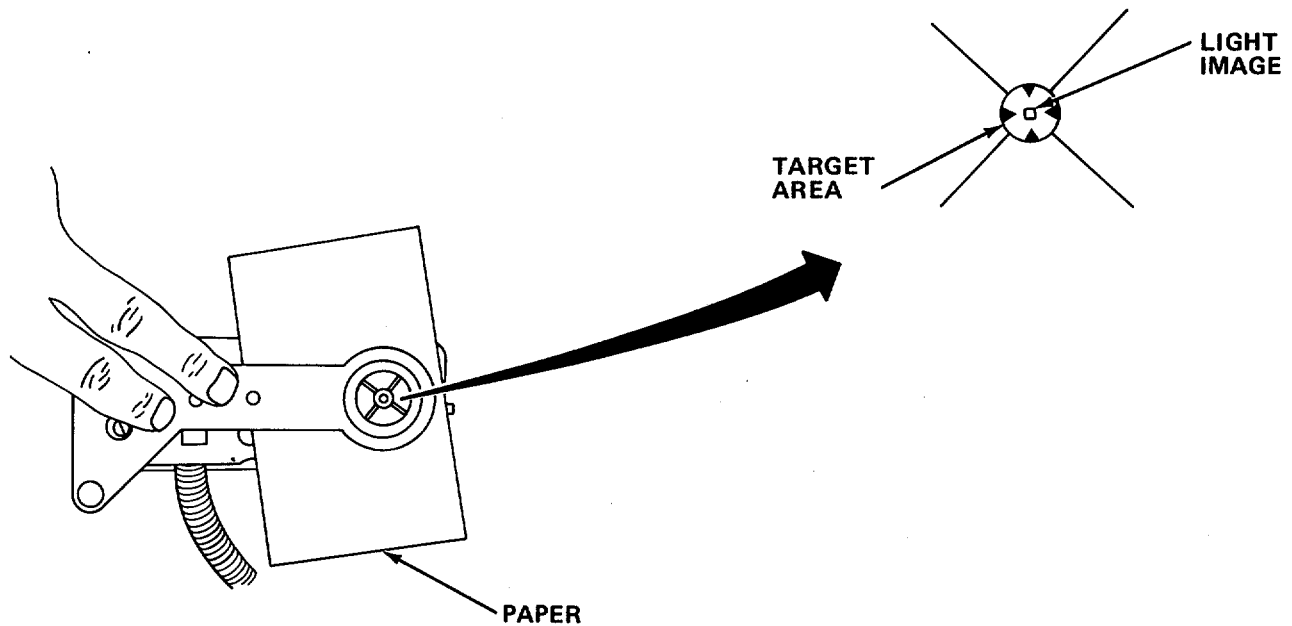
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair

Flat Tip Screwdriver

- a. Apply pressure against reflection probe body and probe base, causing body and base to mate in the normal measurement position.
- b. Check to see that base bottoms-out against probe tip.
- c. If necessary, loosen two base screws and realine.
- d. Place a piece of translucent white paper over target area.
- e. Check to see that a focused rectangular image appears approximately in the center of target area.



- f. If necessary, remove probe housing cover and adjust physical position of lamp.

7-16.19 Remove/Install Transmission Probe on Folding Table .

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair

Flat Tip Screwdriver

Cross Tip Screwdriver

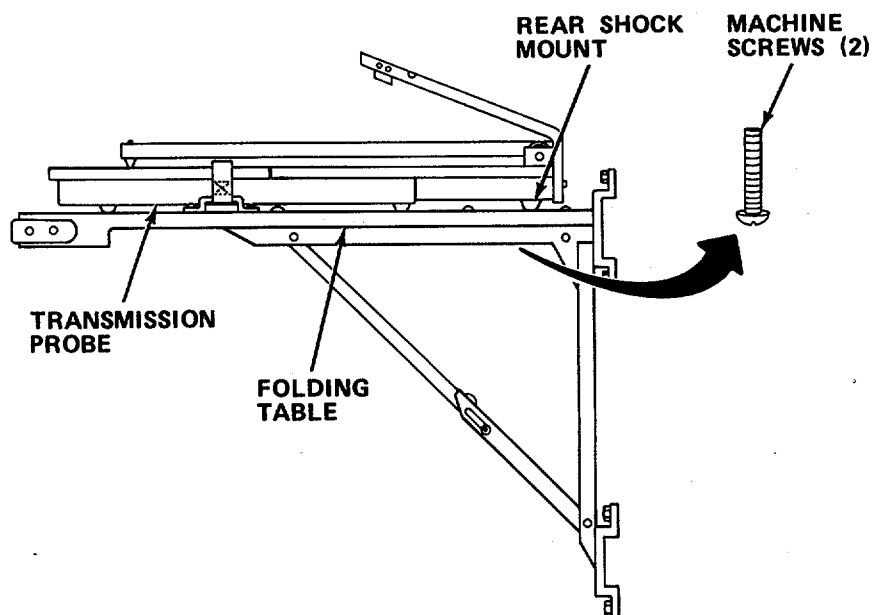
Nutdriver Set

SUPPLIES: Transmission Probe

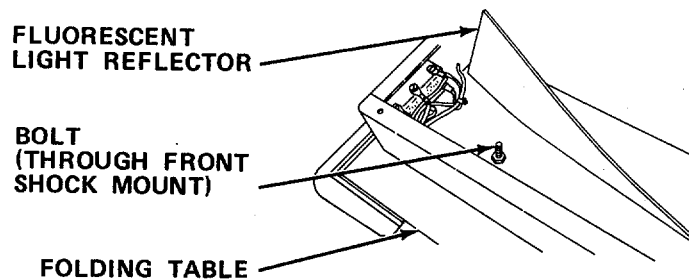
WARNING

Death or serious injury may occur from electrical shock unless power cord is unplugged before beginning removal of transmission probe.

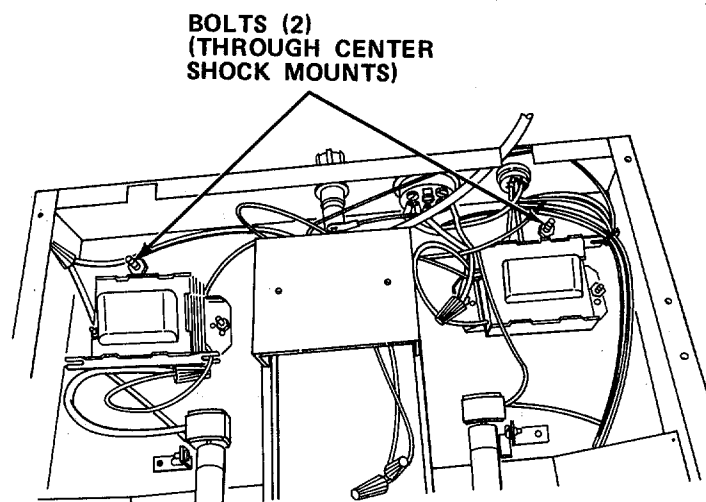
- a. Unplug power cord.



- b. Raise folding transmission probe table to in-use position.
c. Remove two machine screws securing rear transmission probe shock mounts, from beneath folding table.
d. Remove table platen.



- e. Carefully bend fluorescent light reflector upward.
- f. Remove two nuts and star washers from bolts securing front shock mounts to folding table.
- g. Remove rear transmission probe housing cover.



- h. Remove nuts and star washers from two bolts securing center of transmission probe to folding table. Remove defective probe.
- i. Install new transmission probe. Reinstall two bolts, star washers and nuts securing center of probe to folding table.
- j. Reinstall two bolts, star washers, and nuts securing front shock mounts to folding table.
- k. Reinstall two machine screws securing rear shock mounts to folding table.
- l. Reinstall rear transmission probe housing cover and table platen.
- m. Plug in power cord.

7-17. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

7-18. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT.

7-18.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

7-18.2 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.

7-18.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools. List, TM 5-3610-285-24P covering direct/general support maintenance for this equipment.

7-19. 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.
Table

7-4. DIRECT/GENERAL SUPPORT TROUBLESHOOTING

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

1. DENSITOMETER WILL NOT ENERGIZE.

Step 1. Check for defective power supply board.

- (a) If power supply board not defective, proceed to step 2.
- (b) If power supply board defective, replace power supply board assembly (paragraph 7-20.4).

Table 7-4. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. DENSITOMETER WILL NOT ENERGIZE - Cont	Step 2. Check for defective display board.	<ul style="list-style-type: none"> (a) If display board not defective, notify supervisor. (b) If display board defective, replace display board assembly (paragraph 7-20.5).
2. REFLECTION PROBE LAMP WILL NOT LIGHT.	Defective power supply board assembly.	Replace power supply board assembly (paragraph 7-20.4).
3. NO RESPONSE TO PROBE READ PUSHBUTTON.	Step 1. Check for defective logic board assembly.	<ul style="list-style-type: none"> (a) If logic board assembly not defective, proceed to step 2. (b) If logic board assembly defective, replace logic board assembly (paragraph 7-20.3).
	Step 2. Check for defective clock board assembly.	<ul style="list-style-type: none"> (a) If clock board assembly not defective, notify supervisor. (b) If clock board assembly defective, replace clock board assembly (paragraph 7-20.2).
4. TWO NUMBERS DISPLAYED IN SAME COLUMN OR ONE NUMBER MISSING IN COLUMN.	Defective display board assembly.	Replace display board assembly (paragraph 7-20.5).

Table 7-4. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
5.	DIGITAL DISPLAY DOES NOT CHANGE WHEN CHANNEL CONTROL SWITCH IS ROTATED. Step 1. Check for defective channel control switch. (a) If switch not defective, proceed to step 2. (b) If switch defective, replace channel control switch (paragraph 7-20.1). Step 2. Check for defective display board. (a) If display board not defective, notify supervisor. (b) If display board defective, replace display board assembly (paragraph 7-20.5).	
6.	FIRST DIGIT OF DIGITAL DISPLAY MAINTAINS A WHOLE NUMBER FOR ALL SAMPLES TESTED. Defective photomultiplier board assembly. Replace photomultiplier board assembly (paragraph 7-20.6).	

7-20. MAINTENANCE PROCEDURES.

a. This section contains instructions covering direct/general support maintenance functions for the digital densitometer. 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.

PROCEDURES	INDEX	PARAGRAPH
Replace Channel Control Switch		7-20.1
Replace Clock Board Assembly		7-20.2

INDEX - Cont

PROCEDURES	PARAGRAPH
Replace Logic Board Assembly	7-20.3
Replace Power Supply Board Assembly	7-20.4
Replace Display Board Assembly	7-20.5
Replace Photomultiplier Board Assembly	7-20.6

7-20.1 Replace CHANNEL Control Switch .

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

Tool Kit, Electronic Repair

Flat Tip Screwdriver

Hex head Key Wrench Set

Nut Driver Set

Soldering Iron

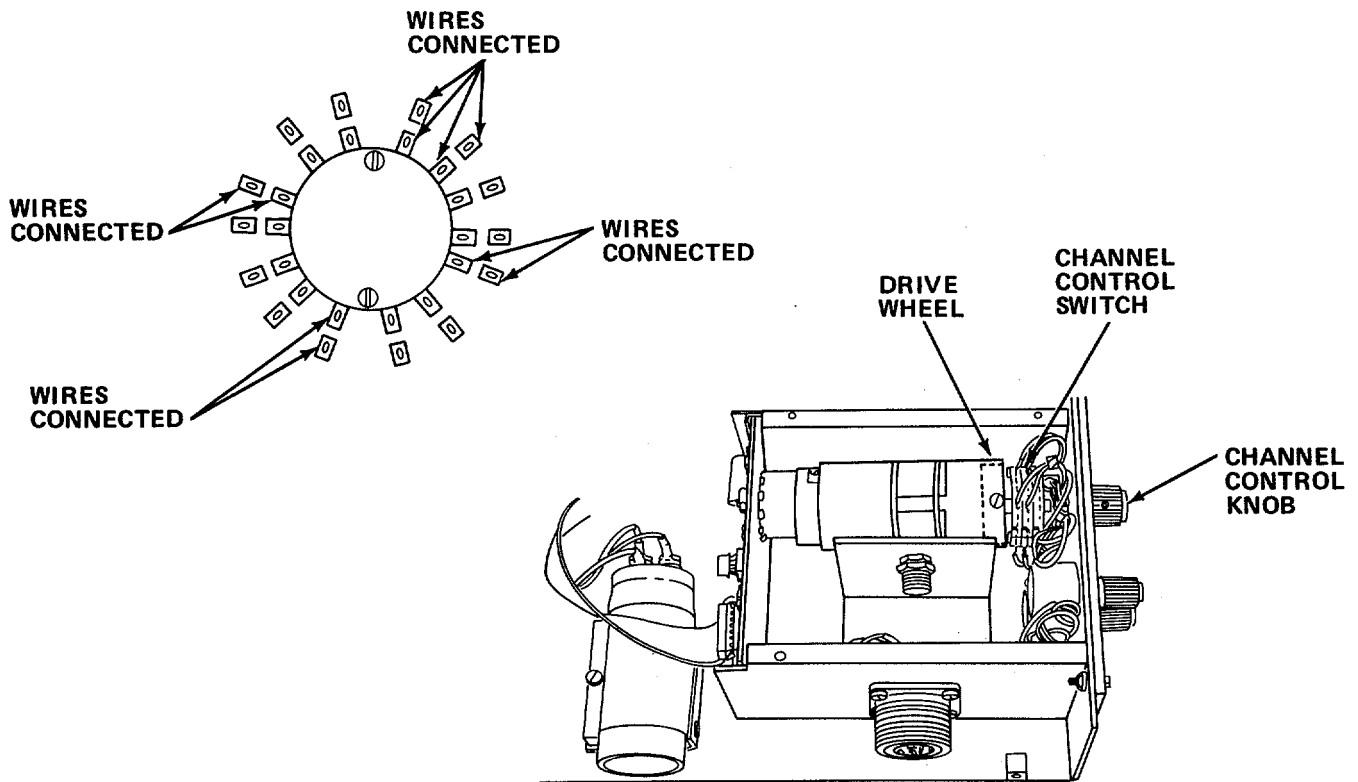
SUPPLIES: CHANNEL Control Switch
Solder

WARNING

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

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.
- d. Remove four screws securing filter light shield to chassis and remove light shield.
- e. Remove photomultiplier board assembly (paragraph 7-20.6, steps e through h).
- f. Remove CHANNEL control knob.

g. Mark position of drive wheel on switch shaft, remove drive wheel.



- h. Remove nut securing CHANNEL control switch to chassis.
- i. Remove defective CHANNEL control switch from chassis.
- j. Tag and desolder wires-from CHANNEL control switch.
- k. Solder wires to new channel control switch.
- l. Install new CHANNEL control switch.
- m. Install drive wheel on new switch shaft. Aline with mark made in step g
- n. Reinstall photomultiplier board assembly.
- o. Install ribbon cable connector.
- p. Reinstall switch knob.
- q. Reinstall light shield.
- r. Reinstall chassis cover and secure with screws.
- s. Plug in reflection/transmission probe cable.
- t. Plug in power cord.

7-20.2 Replace Clock Board Assembly.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

Tool Kit, Electronic Repair

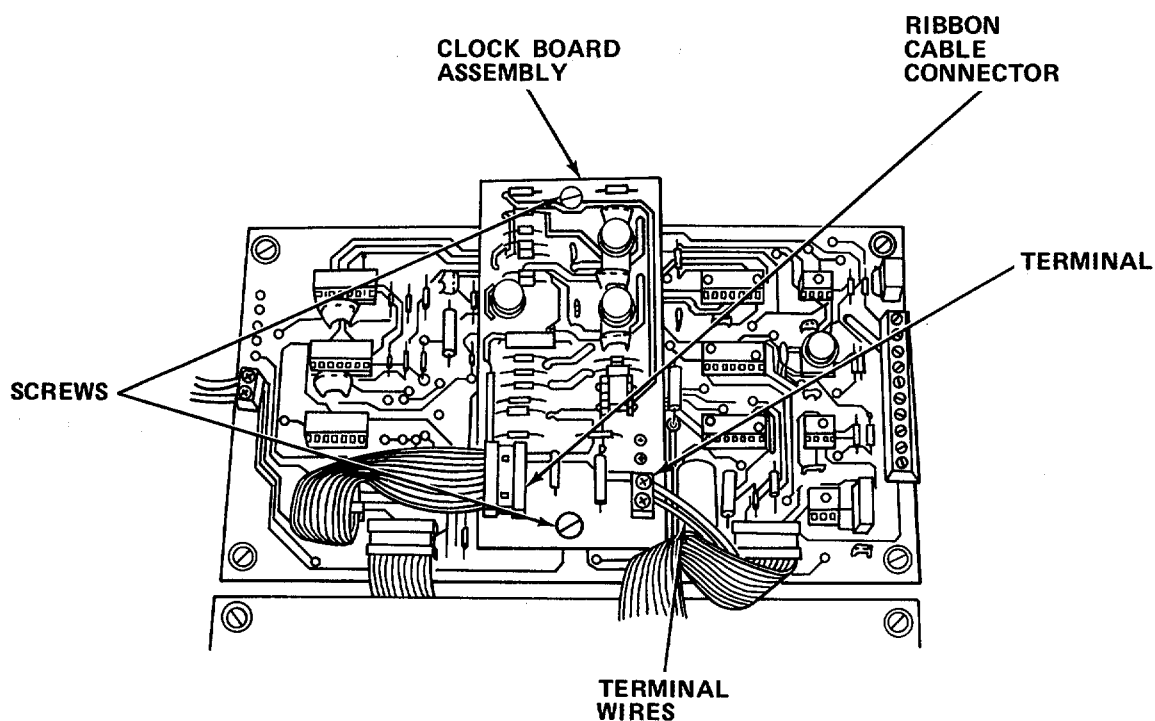
Flat Tip Screwdriver

SUPPLIES: Clock Board Assembly

WARNING

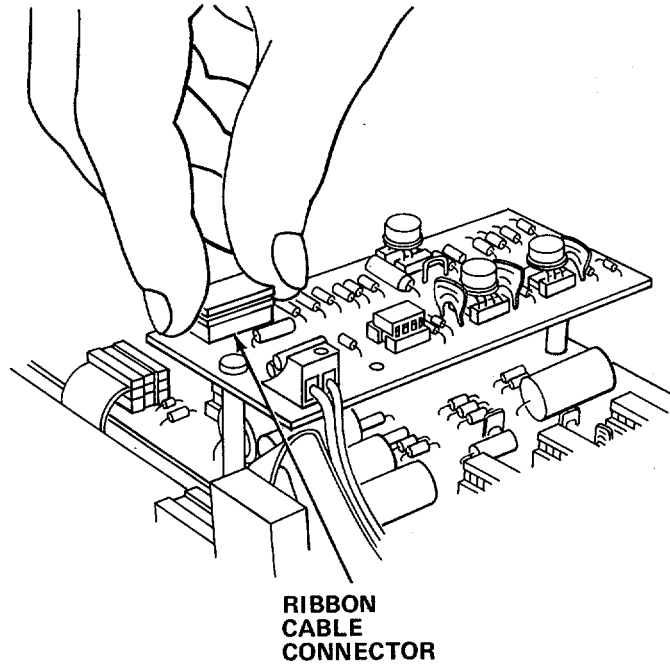
Death or serious injury may occur from electrical shock unless power cord is unplugged before repairing equipment.

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.
- d. Remove ribbon cable connector.



- e. Tag and disconnect wires from terminal.
- f. Remove screws, washers, and spacers securing clock board in place.

- g. Remove defective clock board assembly.
- h. Install new clock board assembly, and reconnect wires to terminal.



- i. Align pins on ribbon cable connector with holes in socket. Apply even pressure to seat connector.
- j. Reinstall chassis cover and secure with screws.
- k. Plug in reflection/transmission probe cable.
- l. Plug in power cord.

NOTE

If equipment continues erratic operation, perform densitometer checkout alignment procedures (paragraphs 7-16.17 and 7-16.18).

7-20.3 Replace Logic Board Assembly.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

Tool Kit, Electronic Repair

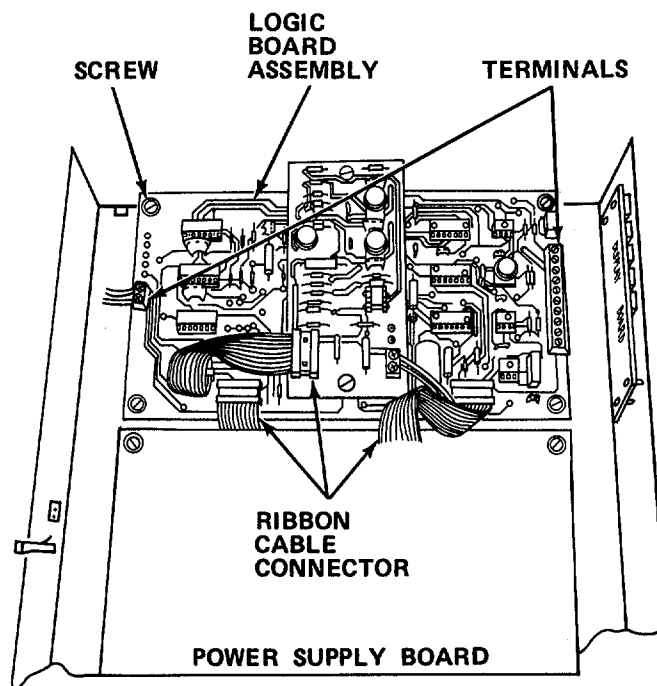
Flat Tip Screwdriver

SUPPLIES: Logic Board Assembly

WARNING

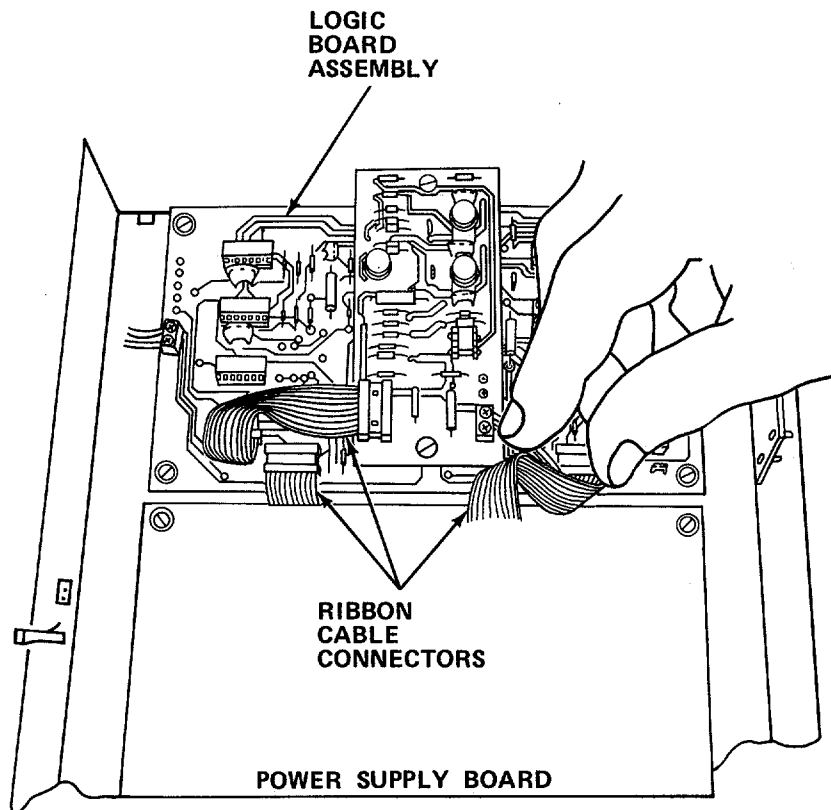
Death or serious injury may occur from electrical shock unless power cord is unplugged before repairing equipment.

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.
- d. Remove clock board assembly (paragraph 7-20.2).
- e. Remove ribbon cable connectors.



- f. Tag and disconnect wires from terminals.

- g. Remove screws and washers securing logic board to chassis.
- h. Remove defective logic board.
- i. Install new logic board and reconnect wires to terminals.



- j. Aline pins on ribbon cable connectors with holes in sockets.
- k. Apply even pressure to seat connectors.
- l. Reinstall clock board assembly.
- m. Reinstall chassis cover and secure with screws.
- n. Plug in reflection/transmission probe cable.
- o. Plug in power cord.

NOTE

If equipment continues erratic operation, perform densitometer checkout and alinement procedures (paragraphs 7-16.17 and 7-16,18).

7-20.4 Replace Power Supply Board Assembly.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

Tool Kit, Electronic Repair

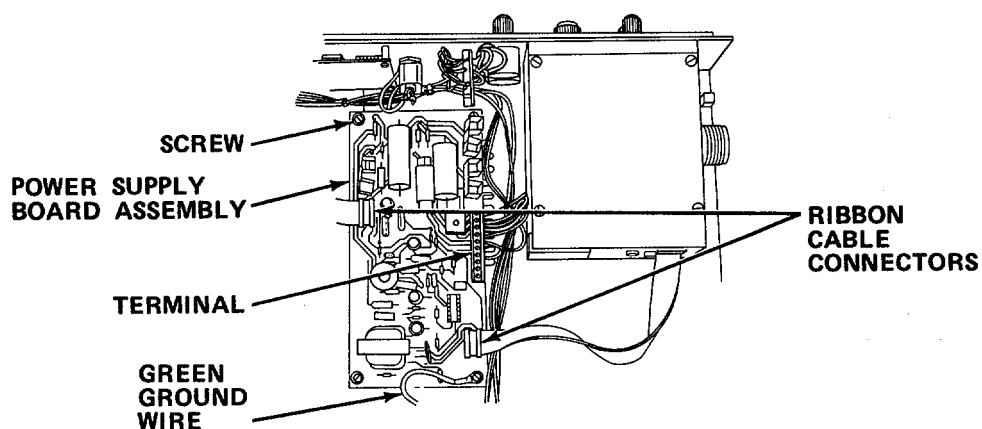
Flat Tip Screwdriver

SUPPLIES: Power Supply Board Assembly

WARNING

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

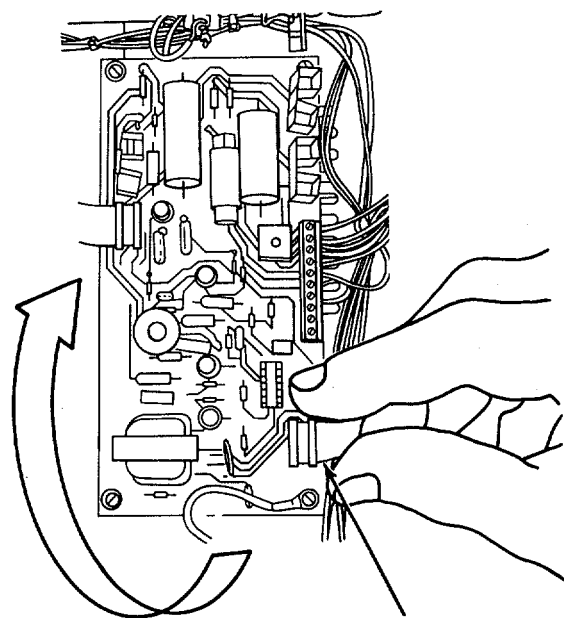
- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.
- d. Remove ribbon cable connectors.

**NOTE**

Green ground wire will be disconnected when defective board is removed .

- e. Tag and disconnect wires from terminals. Remove defective power supply board assembly.

- f. Install new power supply board assembly and reconnect green wire.
- g. Reconnect wires to terminals.



**POWER SUPPLY
BOARD ASSEMBLY**

**RIBBON
CABLE
CONNECTOR (2)**

- h. Aline pins on ribbon cable connectors with holes in sockets.
- i. Apply even pressure to seat connectors.
- j. Reinstall chassis cover and secure with screws.
- k. Plug in reflection/transmission probe cable.
- l. Plug in power cord.

NOTE

If equipment continues erratic operation, perform densitometer checkout and alinement procedures (paragraphs 7-16.17 and 7-16.18).

7-20.5 Replace Display Board Assembly.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

Tool Kit, Electronic Repair

Flat Tip Screwdriver

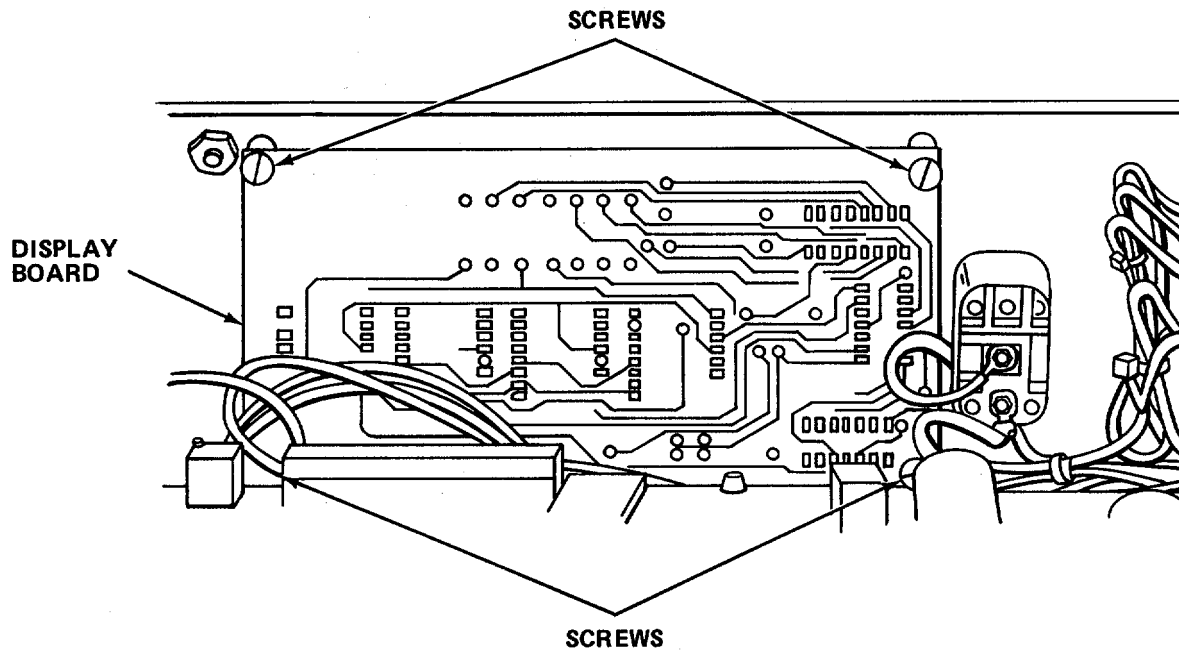
Offset Flat Tip Screwdriver

SUPPLIES: Display Board Assembly

WARNING

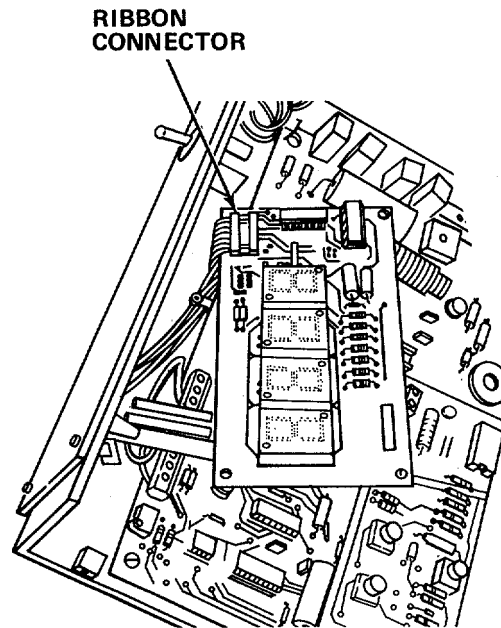
Death or serious injury may occur from electrical shock unless power cord is unplugged before repairing equipment.

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.
- d. Remove screws and washers securing display board assembly to chassis.



- e. Pull display board assembly away from chassis and remove ribbon connector.

- f. Aline pins on connector with holes in socket on new display board assembly.



- g. Apply even pressure to seat connector.
h. Secure new display board assembly with screws and washers.
i. Reinstall chassis cover and secure with screws.
j. Plug in reflection/transmission probe cable.
k. Plug in power cord.

7-20.6 Replace Photomultiplier Board Assembly.

MOS: 35E, Special Electronic Devices Repairer

TOOLS:

Tool Kit, Electronic Repair

Flat Tip Screwdriver

Jeweler's Screwdriver

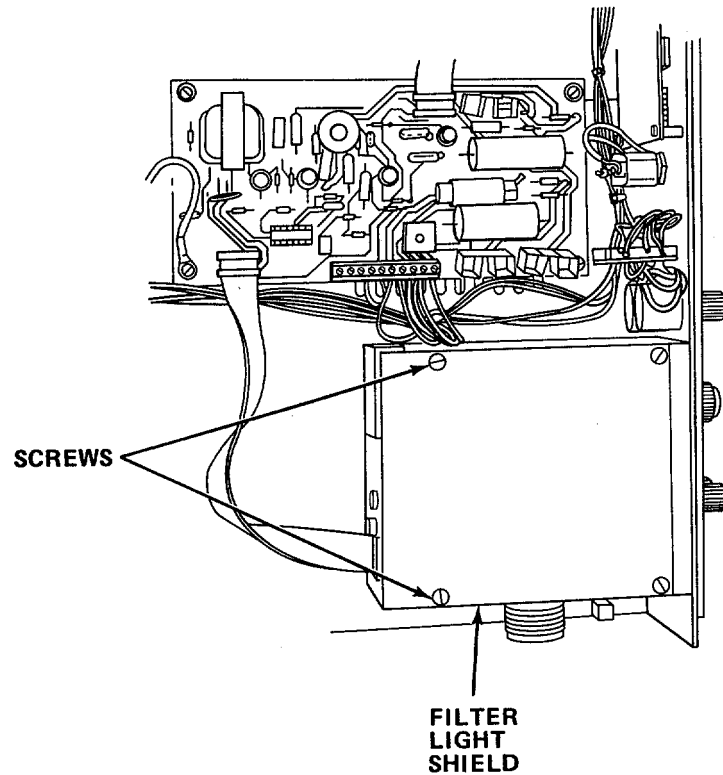
Soldering Iron

SUPPLIES: Photomultiplier Board Assembly
Solder

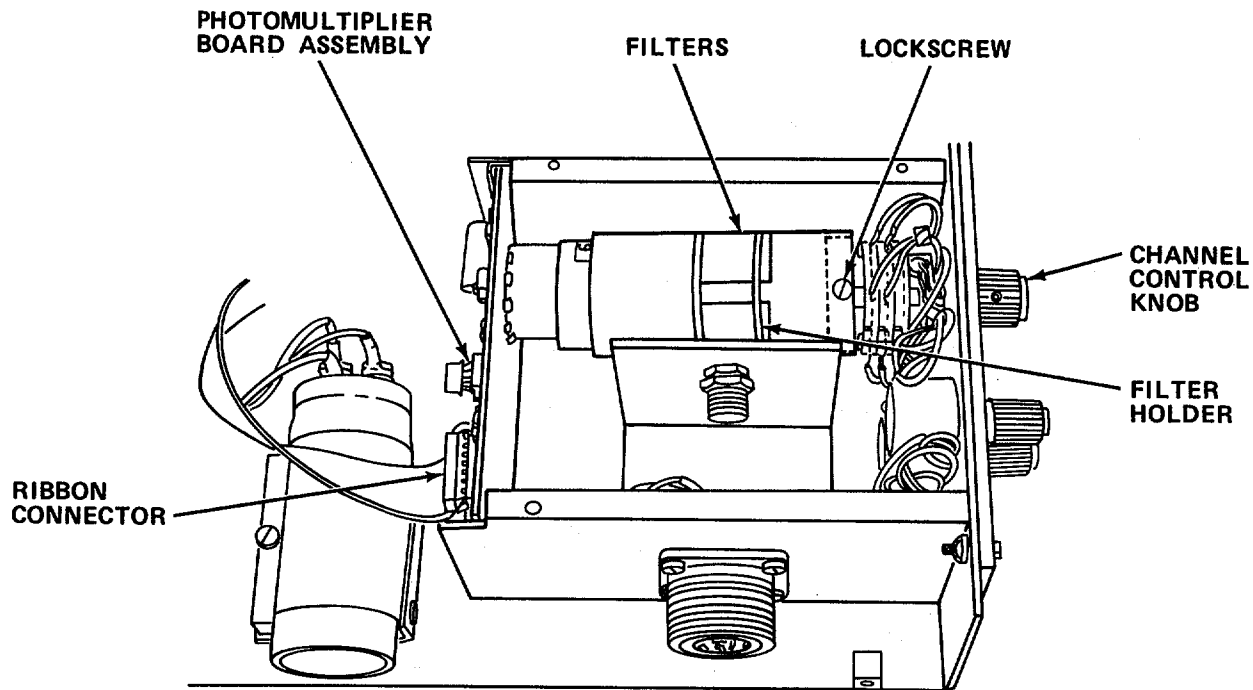
WARNING

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

- a. Unplug power cord.
- b. Unplug reflection/transmission probe cable.
- c. Remove four screws and chassis cover.
- d. Remove filter light shield mount screws and remove light shield.



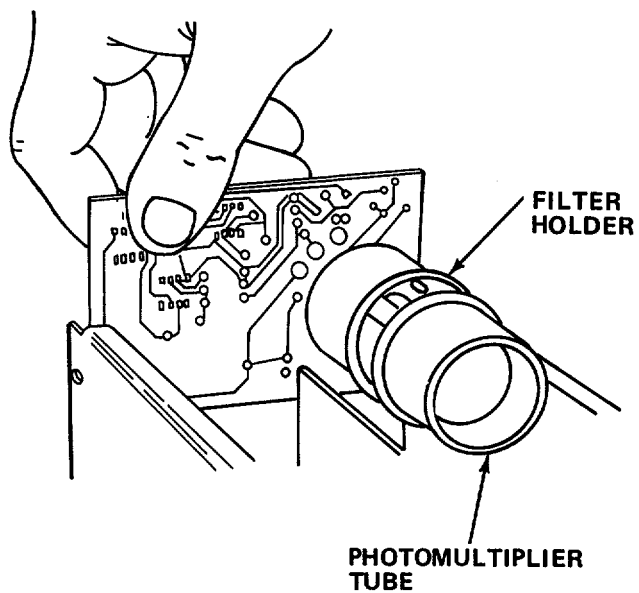
- e. Turn CHANNEL control knob until lock screw is accessible and remove lock screw.



CAUTION

Avoid touching filters on filter holder with fingers.

- f. Slide filter holder to rear of unit.
- g. Remove ribbon cable connector.
- h. Carefully lift out defective photomultiplier board assembly.

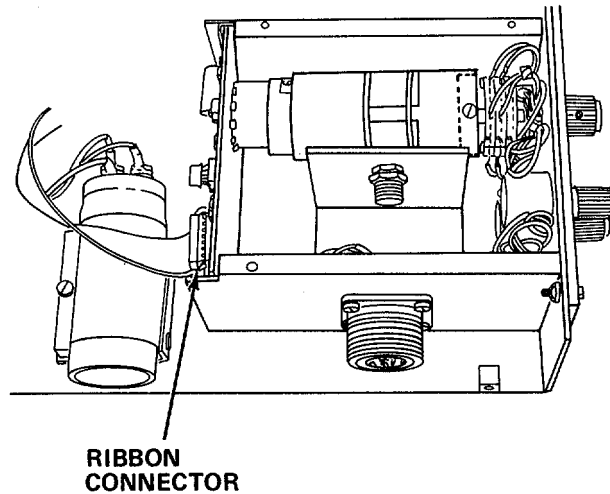


- i. Slide filter holder off photomultiplier tube.

CAUTION

Use gloves to handle photomultiplier tube. Fingerprints will damage tube.

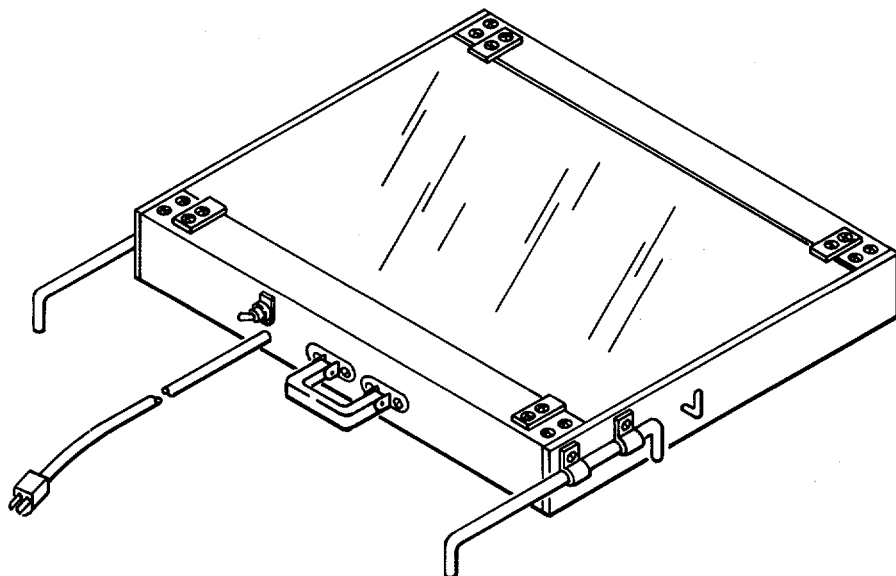
- j. Remove and retain photomultiplier tube.



- k. Aline pins on ribbon cable with holes in socket on new photomultiplier board assembly.
- l. Apply even pressure to seat connector.
- m. Reinstall photomultiplier tube on new photomultiplier board assembly.
- n. Slide filter holder on photomultiplier tube.
- o. Carefully slide new photomultiplier board assembly into holder.
- p. Slide filter holder forward and reinstall lockscrew.
- q. Reinstall filter light shield.
- r. Reinstall chassis cover and secure with screws.
- s. Plug in reflection/transmission probe cable.
- t. Plug in power cord.

NOTE

If equipment continues erratic operation, perform densitometer checkout and alinement procedures (paragraphs 7-16.17 or 7-16.18).



CHAPTER 8

PORTABLE TRACING/SCRIBING BOARD

Section I INTRODUCTION

8-1. GENERAL INFORMATION.

8-1.1 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.

8-2. EQUIPMENT DESCRIPTION.

8-2.1 Equipment Characteristics. Capabilities. and Features. Provides lightweight, portable, and diffused light source. Used as work surface for tracing or scribing.

8-2.2 Equipment Data.

Power Requirements

Illumination

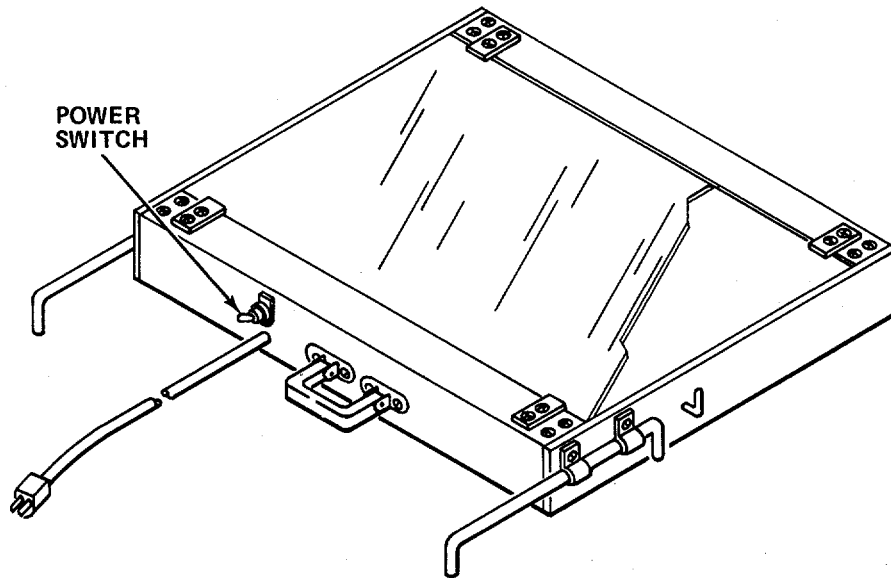
Work Surface

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

8-3. TECHNICAL PRINCIPLES OF OPERATION . Principles of operation are combined with operator's controls and indicators for this equipment.

Section II OPERATING INSTRUCTIONS

8-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.



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

8-5. 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.

8-5.1 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 column. 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.

<u>Item</u>	<u>Quantity</u>
Cheesecloth (Item 14, Appendix E)	ar

Table 8-1. 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
BI - Biennially

(Number) - Hundreds of Hours

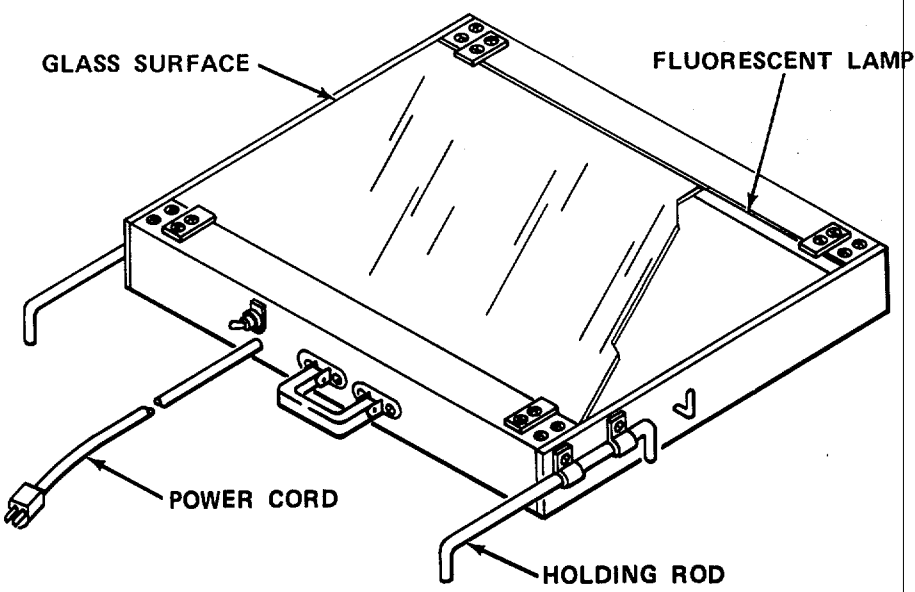
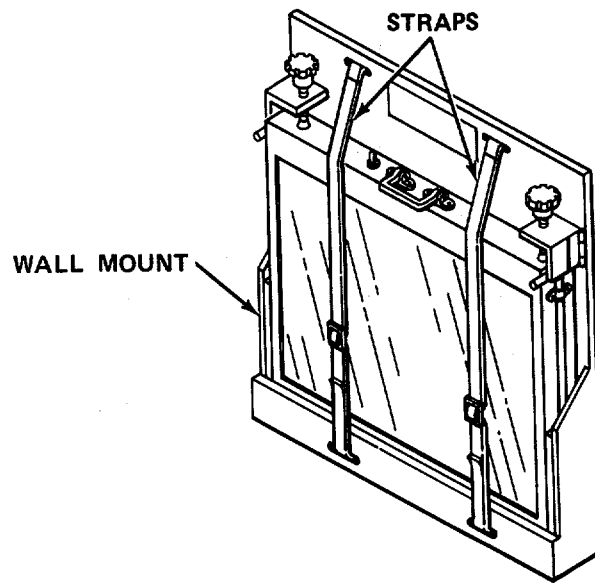
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
1	B	<p><u>PORTABLE TRACING/SCRIBING BOARD</u></p>  <p><u>Inspect/Clean</u></p> <p><u>WARNING</u> Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.</p> <p>1. Rotate each holding rod to check for freedom of movement.</p>	

Table 8-1. 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:
1	B	<p><u>PORTABLE TRACING/SCRIBING BOARD - Cont</u></p> <p><u>Inspect/Clean - Cont</u></p> <ol style="list-style-type: none"> 2. Check power cord for kinks, frays, or burns. If power cord is defective, notify organizational maintenance. 3. Check fluorescent lamps for partial lighting. Replace as needed (paragraph 8-10.2). 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 8-10.4). 	<p>Power cord is damaged.</p> <p>Fluorescent lamp is defective.</p> <p>Glass surface is cracked or scratched.</p>

8-6. OPERATION UNDER USUAL CONDITIONS.**8-6.1. 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.

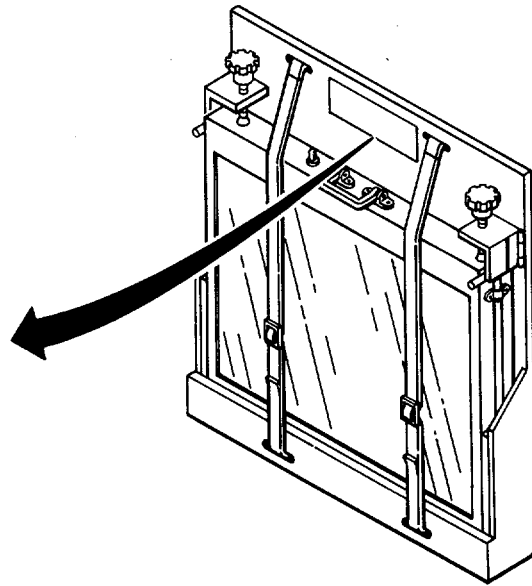
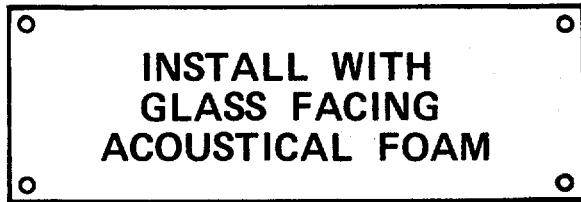
8-6.2. Preparation for Movement.

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.

8-6.3. Operating Instructions on Decals and Instruction Plates.



8-7. OPERATION UNDER UNUSUAL CONDITIONS. This equipment is designed for operation only in a controlled environment.

Section III OPERATOR MAINTENANCE

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

8-9. TROUBLESHOOTING PROCEDURES.

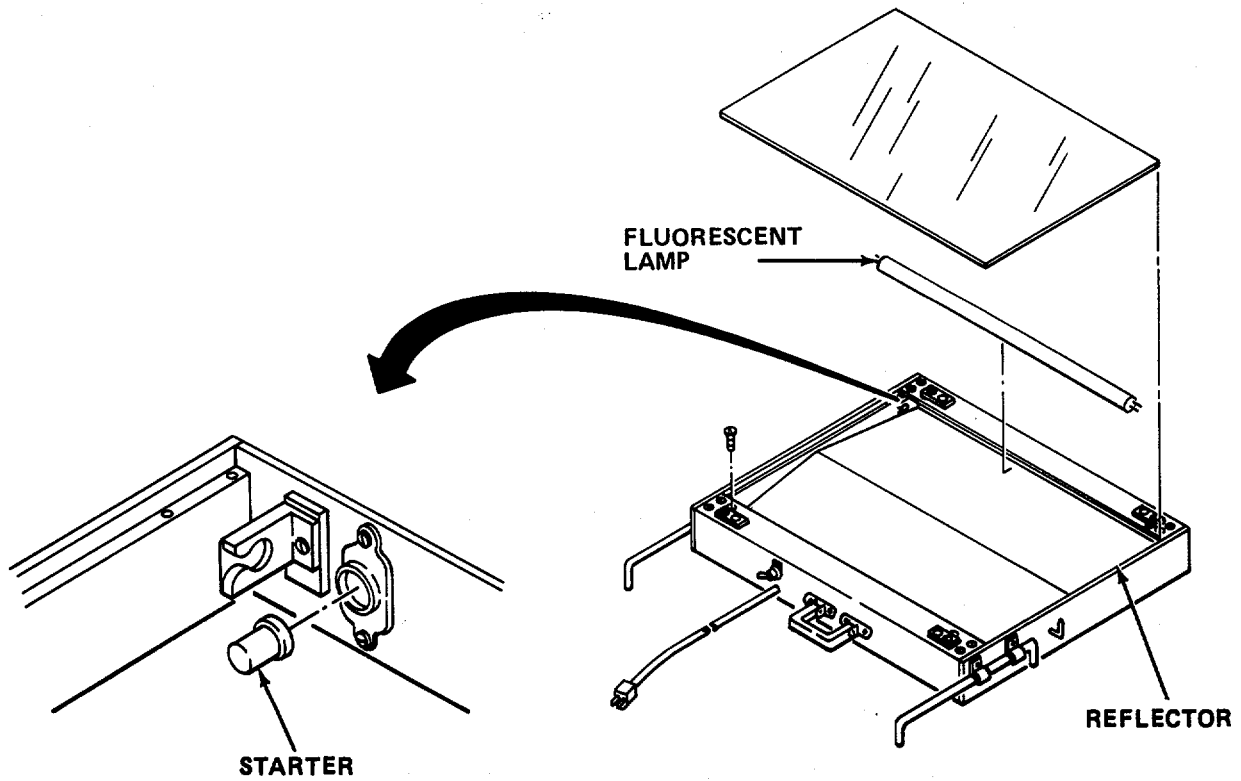
a. The table lists the common malfunctions which you may find during operation or maintenance of the portable tracing/scribing board, or its components. You should perform the test/inspections and corrective actions in the order listed.

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 8-2. 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 8-10.1).

Table 8-2. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
-------------	--------------------	-------------------

1. ILLUMINATION UNEVEN Cont

Step 2. Check to see if either fluorescent lamp is partially lighted or is dark.

- (a) If fluorescent lamp is partially lighted, replace fluorescent lamp (paragraph 8-10.2).
- (b) If illumination is still uneven, proceed to step 3.

Step 3. Check for defective lamp starter.

- (a) If lamp starter is not defective, check with supervisor.
- (b) If lamp starter is defective, replace defective starter (paragraph 8-10.3).

8-10. 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

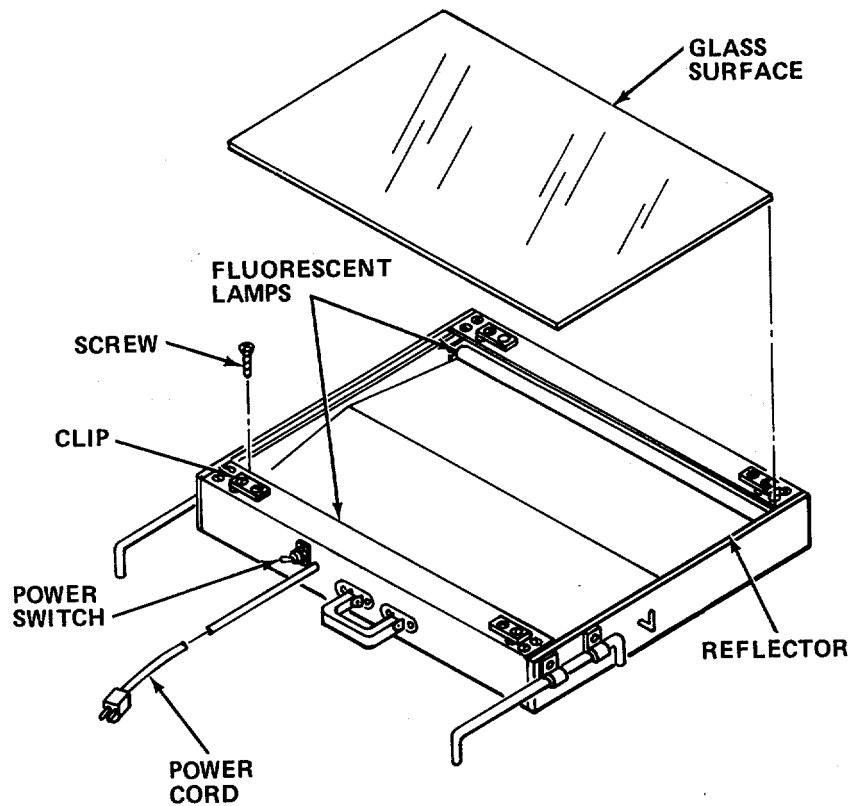
PROCEDURE	PARAGRAPH
Clean Reflector	8-10.1
Replace Fluorescent Lamp.....	8-10.2
Replace Starter	8-10.3
Replace Glass Surface	8-10.4

8-10.1. Clean Reflector.

MOS: 83E, Photo Layout Specialist

TOOLS: Cross Tip Screwdriver Vacuum Cleaner

SUPPLIES: Cheesecloth (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 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.

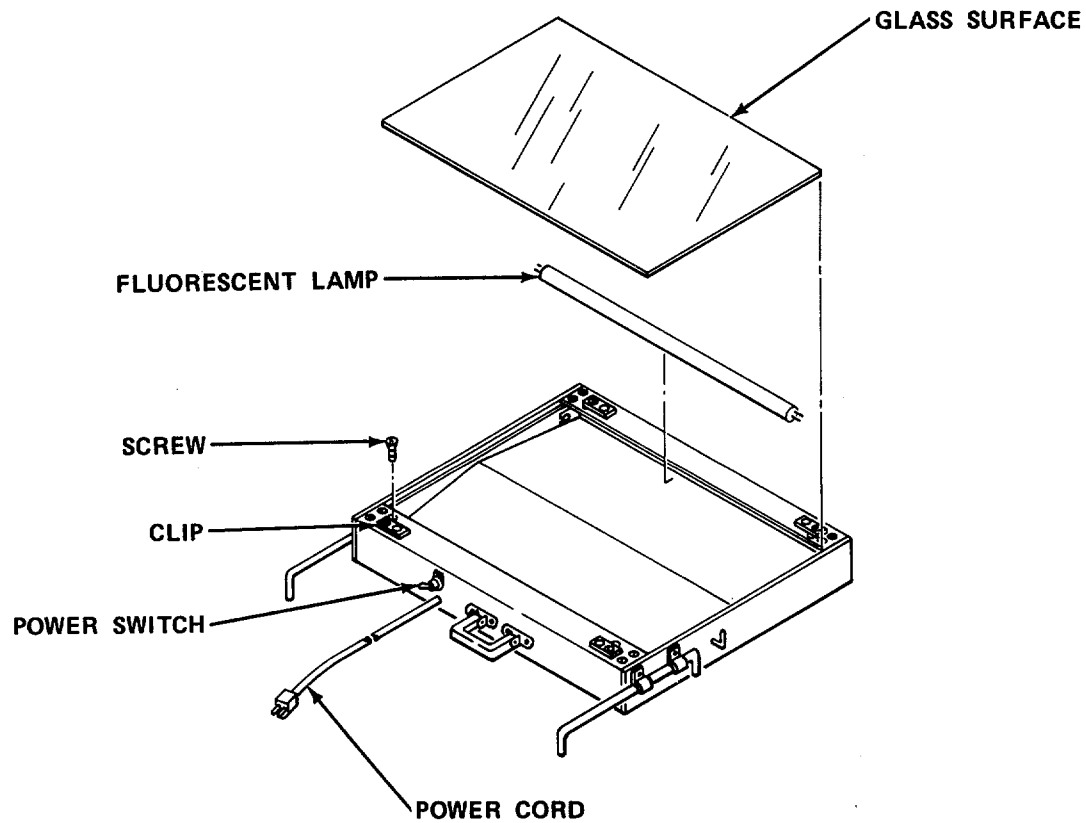
- f. Wipe reflector and lamps with moistened cheesecloth.
- g. Wipe or vacuum both sides of glass surface.
- h. Reinstall glass surface.
- i. Turn clips to secure glass surface. Aline holes and reinstall screws. Tighten all screws.
- j. Plug in power cord and turn power switch ON.

8-10.2. Replace Fluorescent Lamp.

MOS: 83E, Photo Layout Specialist

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.

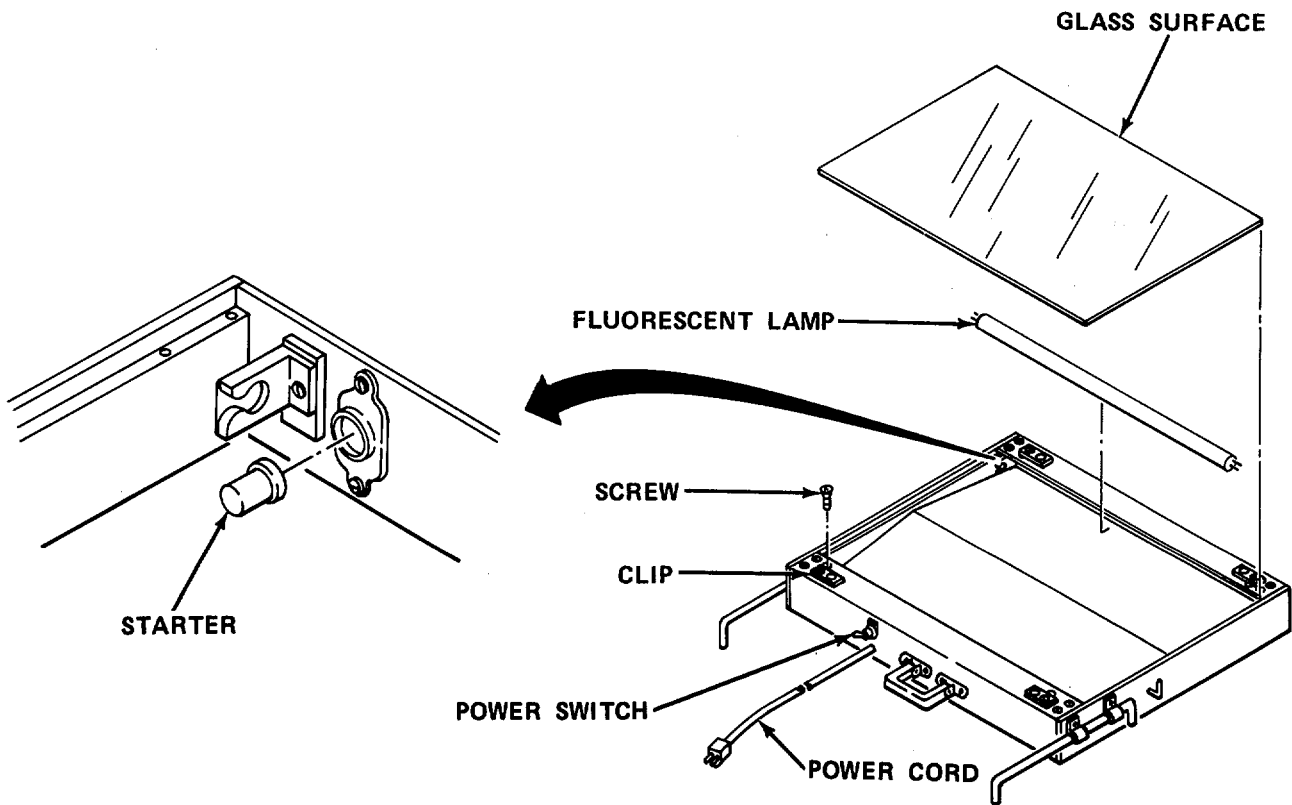
- e. Remove defective fluorescent lamp.
- f. Install new fluorescent lamp.
- g. Reinstall glass surface.
- h. Turn clips to secure glass surface. Aline holes and reinstall screws. Tighten all screws.
- i. Plug in power cord and turn power switch ON.

8-10.3. Replace Starter.

MOS: 83E, Photo Layout Specialist

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 right or left.

CAUTION

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

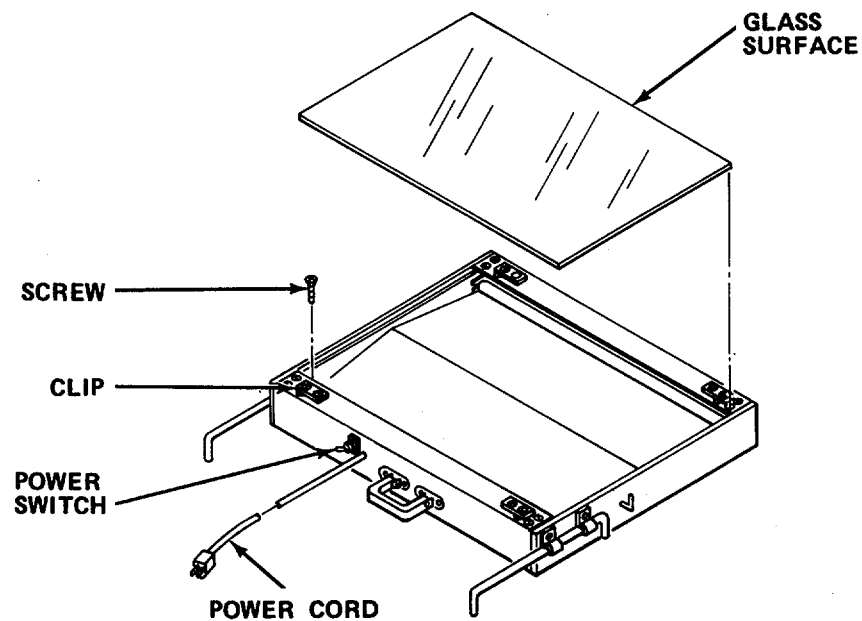
- d. Remove glass surface.
- e. Remove fluorescent lamp in front of starter.
- f. Remove starter by pushing in and turning left until free.
- g. Install new starter in socket by pushing in and turning right until locked.
- h. Reinstall fluorescent lamp.
- i. Reinstall glass surface.
- j. Turn clips to secure glass surface. Aline holes and reinstall screws. Tighten all screws.
- k. Plug in power cord and turn power switch ON.

8-10.4. Replace Glass Surface.

MOS: 83E, Photo Layout Specialist

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 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.

NOTE

Prior to installing new glass surface, glass holding channel must be free of dirt and broken pieces of glass.

- 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

8-11. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

8-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT.

8-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

8-12.2 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.

8-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-3610-285-24P covering organizational maintenance for this equipment.

8-13. SERVICE UPON RECEIPT.

8-13.1 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.

8-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES. There are no organizational PMCS procedures assigned for this equipment.

8-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES. There are no organizational troubleshooting procedures assigned for this equipment.

8-16. 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

PROCEDURE	PARAGRAPH
Replace Power Switch	8-16.1
Replace Power Cord	8-16.2
Replace Ballast Transformer	8-16.3
Remove/Install Mounting Bracket	8-16.4

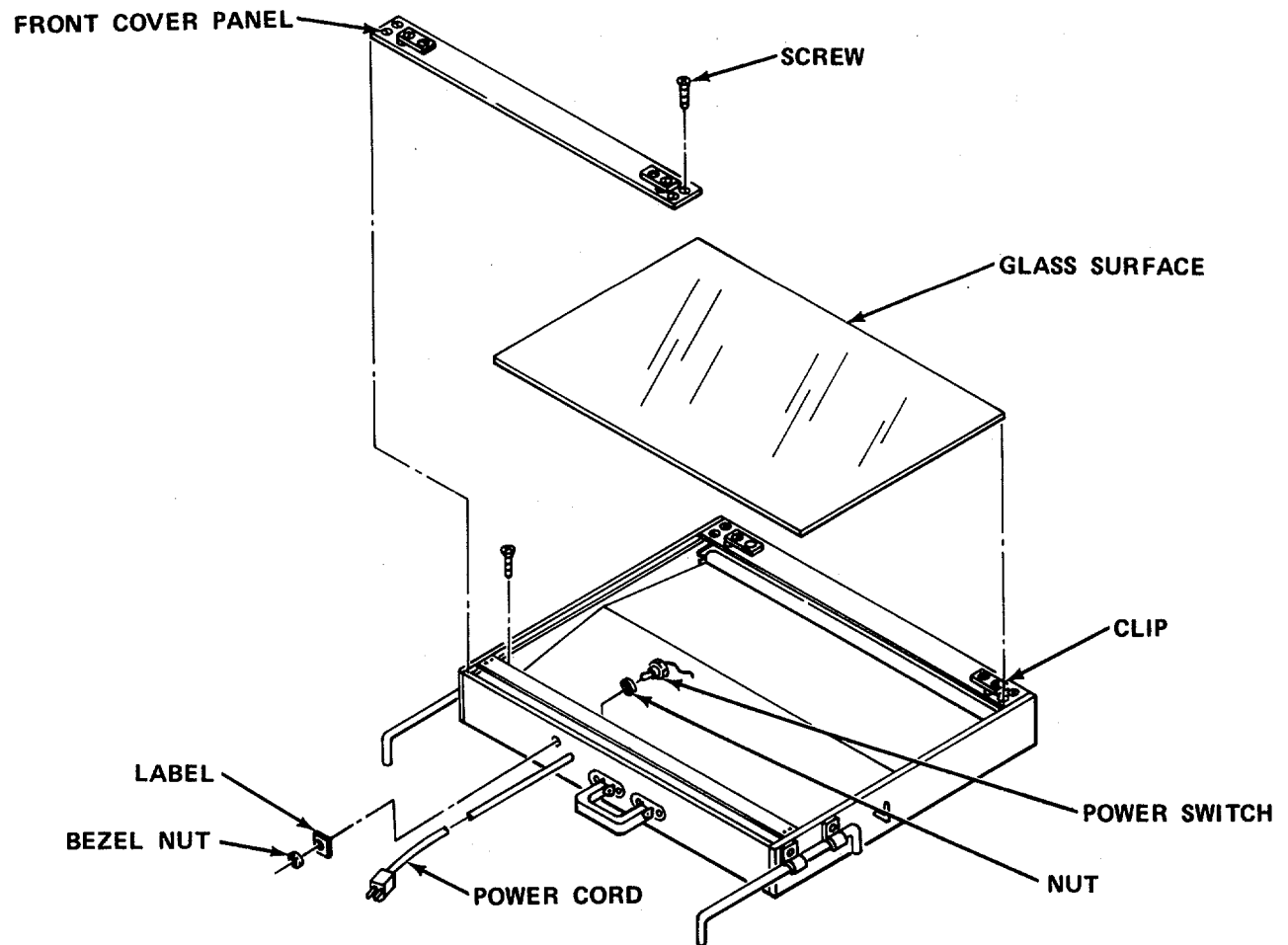
8-16.1. Replace Power Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
 Cross Tip Screwdriver
 Slip Joint Pliers

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 seven screws and front cover panel.
- f. Remove washers and bezel 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 washers and bezel nut. Adjust for proper positioning of power switch.
- k. Reinstall front cover panel and secure with seven 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.

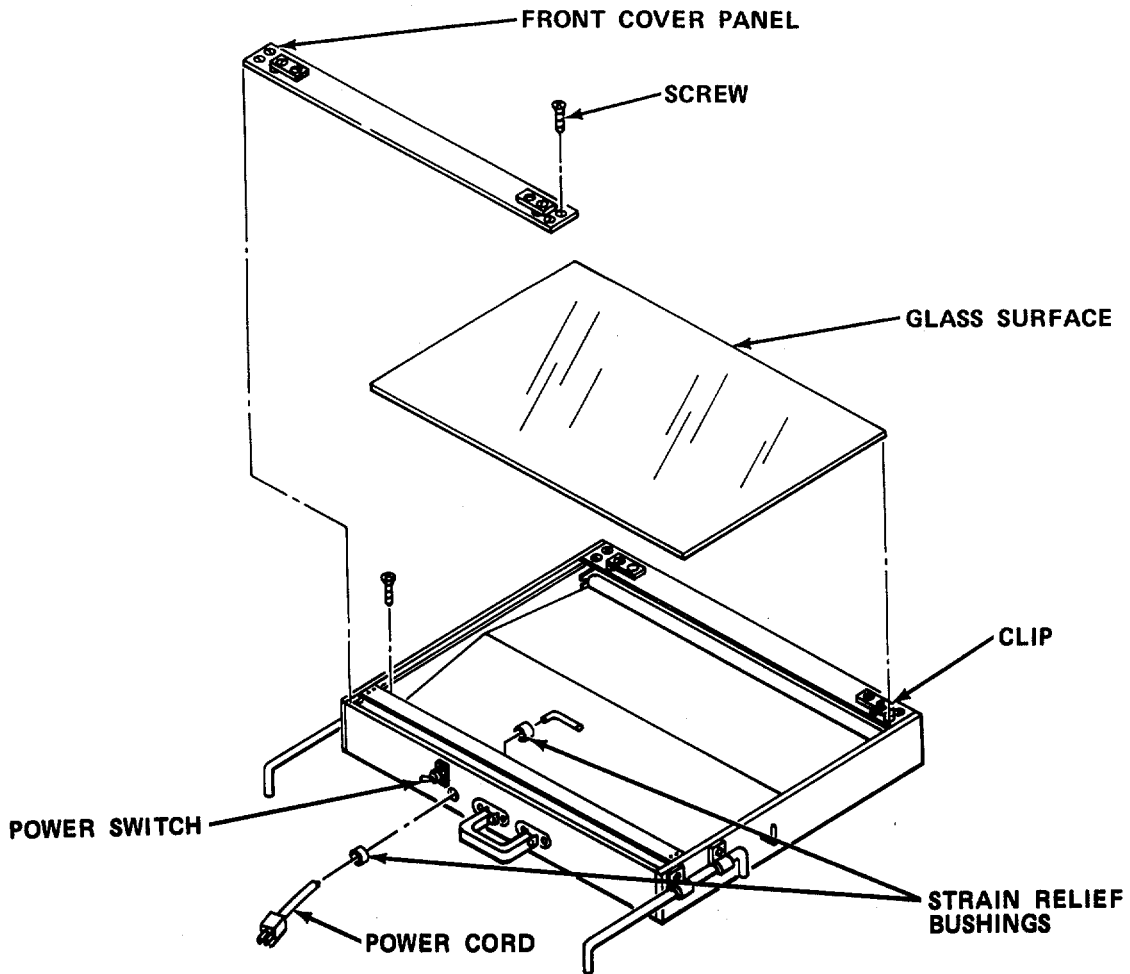
8-16.2. Replace Power Cord.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
 Cross Tip Screwdriver
 Needle Nose Pliers

SUPPLIES: Power Cord Wire Nuts



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 seven screws and front cover panel.
- f. Tag and cut wires.
- 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 with wire nuts and remove tags.
 - j. Reinstall front cover panel and secure with seven 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.

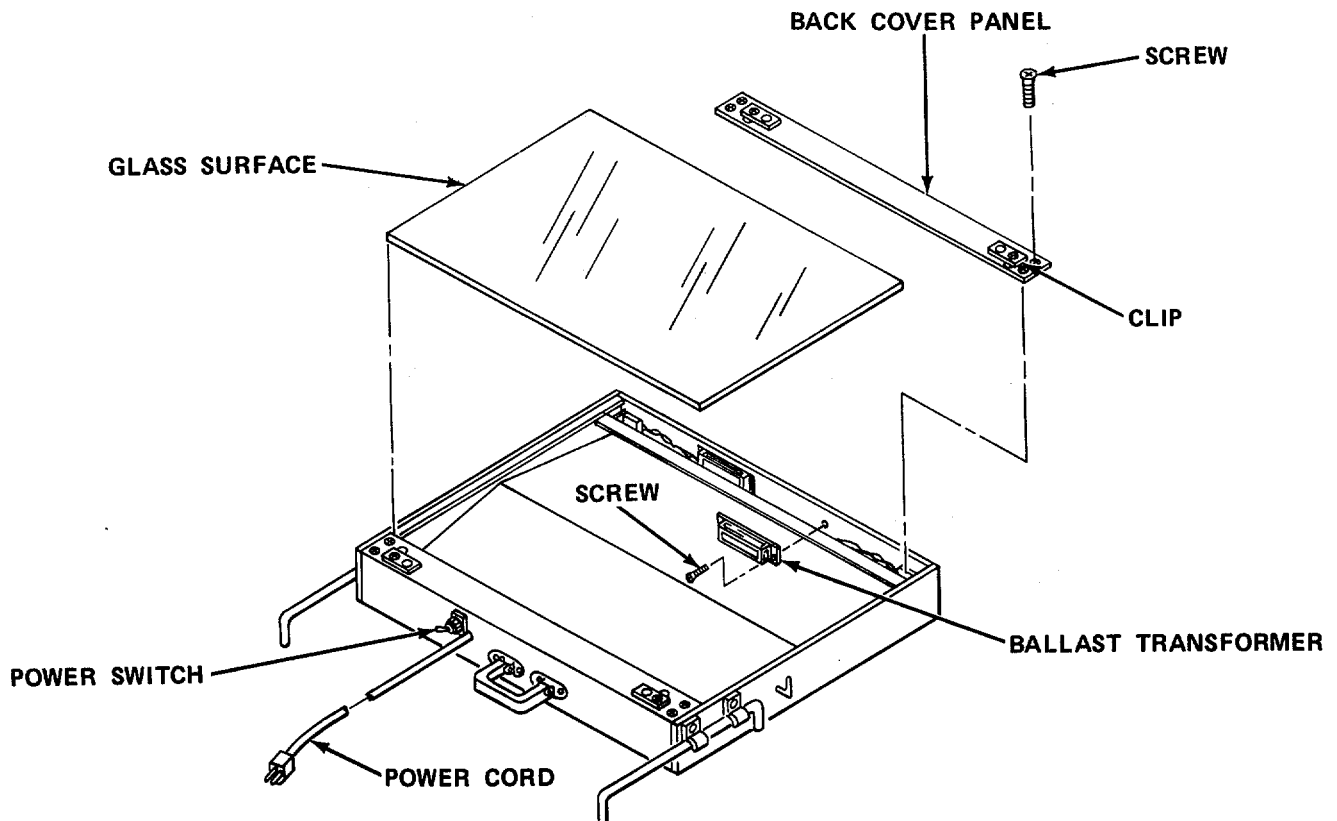
8-16.3. Replace Ballast Transformer.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair Cross Tip Screwdriver

SUPPLIES: Ballast Transformer Wire Nuts

**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 seven screws and back cover panel.
- f. Remove screws and defective ballast transformer.
- g. Tag and cut wires from ballast transformer.
- h. Connect wiring on new ballast transformer with wire nuts 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.
- 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.

8-16.4. Remove/Install Mounting Bracket.

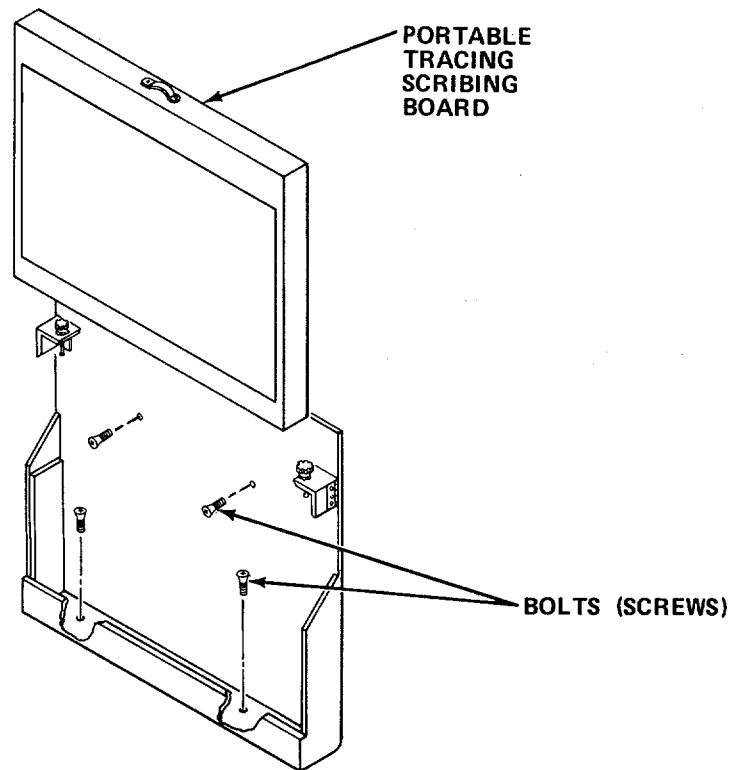
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair Cross Tip Screwdriver

SUPPLIES: Mounting Bracket

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



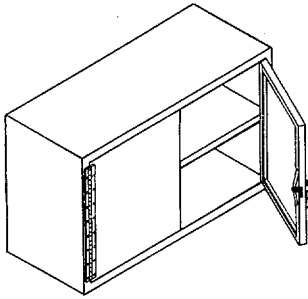
- b. Remove attaching hardware securing defective mounting bracket to wall.
- c. Remove attaching hardware securing defective mounting bracket to floor.
- d. Remove defective mounting bracket.

- 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.

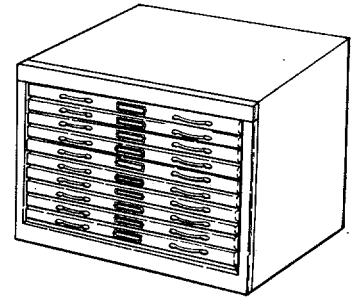
8-17. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

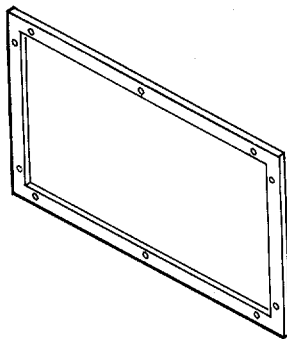
There are no direct/ general support maintenance procedures assigned for this equipment.



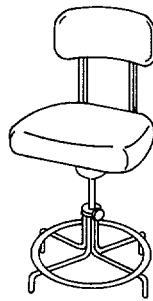
**WALL
STORAGE
CABINET**



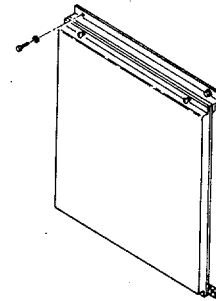
**TEN-DRAWER
PHOTOLITHOGRAPHIC
CABINET**



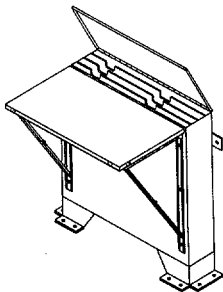
CORKBOARD



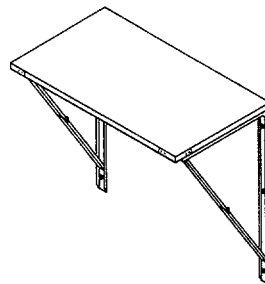
**ROTARY
DRAFTING
CHAIR**



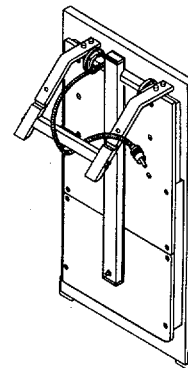
**GLASS
HOLDER**



**VERTICAL PLATE STORAGE
CABINET WITH FOLDING
WORK SURFACE**



**FOLDING WORK
SURFACE**



**FOLDING TRANSMISSION
PROBE TABLE**

CHAPTER 9
FURNITURE AND CABINETS
Section I INTRODUCTION

9-1. GENERAL INFORMATION.

9-1.1 Scope. This chapter contains the description of all furniture and cabinets contained in this section.

9-2. EQUIPMENT DESCRIPTION.

a. Wall Storage Cabinet. Used for miscellaneous storage. There are two shelves. The two doors are held shut by a handle-type latch. Dimensions:

Width	30.0 in. (76.2 cm)
Depth	12.0 in. (30.5 cm)
Height	18.0 in. (45.7 cm)

b. 10-Drawer Photolithographic Cabinet. Used for the storage of photolithographic materials and supplies. The cabinet has ten sliding drawers. Dimensions:

Width	37 in. (94.0 cm)
Depth	32 in. (81.3 cm)
Height	34 in. (86.4 cm)

c. Corkboard. Wall-mounted. Used for posting information. Dimensions:

Width	30.0 in. (76.2 cm)
Height	18.0 in. (45.7 cm)

d. Rotary Drafting Chair. Provides seating for drafting personnel. It has adjustable seat height and back position. Dimensions:

Width	17.12 in. (43.5 cm)
Depth	17.12 in. (43.5 cm)
Height	42.0 in. (106.7 cm), maximum 36.0 in. (91.4 cm), minimum

e. Glass Holder. Used to store glass light shield for flip-top platemaker. The holder is wall mounted. Dimensions:

Width 26.75 in. (67.95 cm)

Height 31.25 in. (79.38 cm)

f. Vertical Plate Storage Cabinet. Used to store photolithographic plates.

Width 36 in. (91.4 cm)

Depth 8.5 in. (21.6 cm)

Height 34 in. (86.4 cm)

(1). Folding Work Surface. Used for accessory equipment, miscellaneous tasks.

Width 36 in. (91.4 cm)

Depth 22 in. (55.9 cm)

g. Folding Transmission Probe Table. Used with digital densitometer.

Width 14.5 in. (36.8 cm)

Depth 32 in. (81.3 cm)

h. Folding Work Surface. Used for accessory equipment, miscellaneous tasks.

Width 45 in. (114.3 cm)

Depth 30.2 in. (76.7 cm)

9-3. TECHNICAL PRINCIPLES OF OPERATION. There are no specific principles of operation for this equipment.

Section II OPERATING INSTRUCTIONS

9-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS. This equipment has no operator's controls or indicators.

9-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES. There are no operator PMCS procedures assigned for this equipment.

9-6. OPERATION UNDER USUAL CONDITIONS.

9-6.1 Preparation for Movement. Ensure that portable equipment is properly secured with tiedowns provided.

9-7. OPERATION UNDER UNUSUAL CONDITIONS. This equipment is designed for operation only in a controlled environment.

Section III OPERATOR MAINTENANCE

9-8. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

9-9. TROUBLESHOOTING PROCEDURES. There are no operator troubleshooting procedures assigned for this equipment.

9-10. MAINTENANCE PROCEDURES.

a. This section contains instructions covering operator maintenance functions for the furniture and cabinets. 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.

9-10.1 Inspect Cabinets and Furniture. Inspect furniture and cabinets for structural damage, rust and proper operation of all latches, hinges, drawer slides and adjustment mechanisms.

Section IV ORGANIZATIONAL MAINTENANCE

9-11. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication.

9-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT.

9-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

9-12.2 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.

9-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-3610-285-24P covering organizational maintenance for this equipment.

9-13. SERVICE UPON RECEIPT.

9-13.1 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.

9-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES. There are no organizational PMCS procedures assigned for this equipment.

9-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES. There are no organizational troubleshooting procedures assigned for this equipment.

9-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the furniture and cabinets. 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

PROCEDURE	PARAGRAPH
Remove/Install Wall Storage Cabinet	9-16.1
Replace Door Latch (Wall Storage Cabinet)	9-16.2
Replace Door Hinge	9-16.3
Remove/Install Corkboard	9-16.4
Remove/Install 10-Drawer Photolithographic Cabinet.....	9-16.5
Remove/Install Glass Holder	9-16.6
Remove/Install Vertical Plate Storage Cabinet	9-16.7
Remove/Install Folding Transmission Probe Table	9-16.8
Remove/Install Folding Work Surface from Plate Storage Cabinet	9-16.9
Remove/Install Folding Work Surface	9-16.10

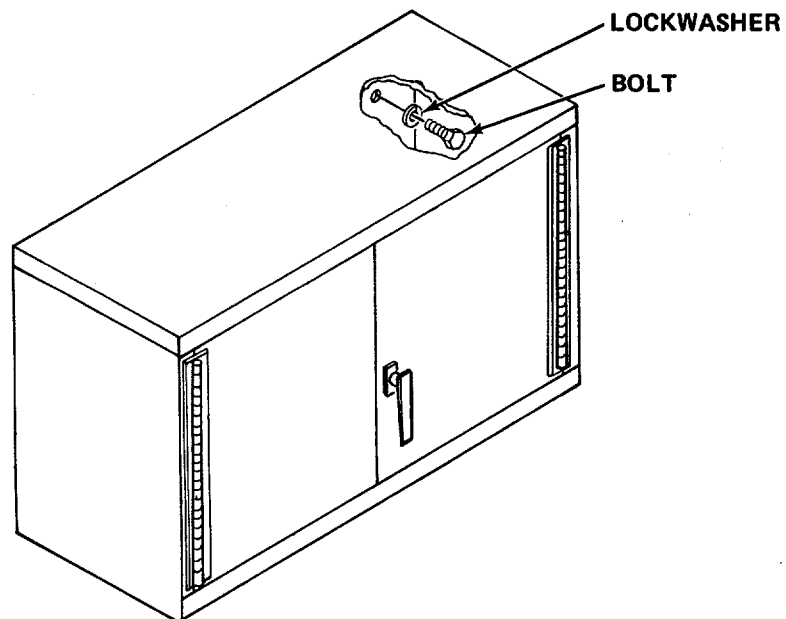
9-16.1. Remove/Install Wall Storage Cabinet.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
 1/2 in. Drive Ratchet
 2 in. Socket Extension, 1/2 in. Drive
 1/2 in. Socket, 1/2 in. Drive

SUPPLIES: Wall Storage Cabinet



- a. Remove bolts and lockwashers which secure defective cabinet to wall.
- b. Remove defective cabinet.
- c. Install new cabinet and secure to wall with lockwashers and bolts.

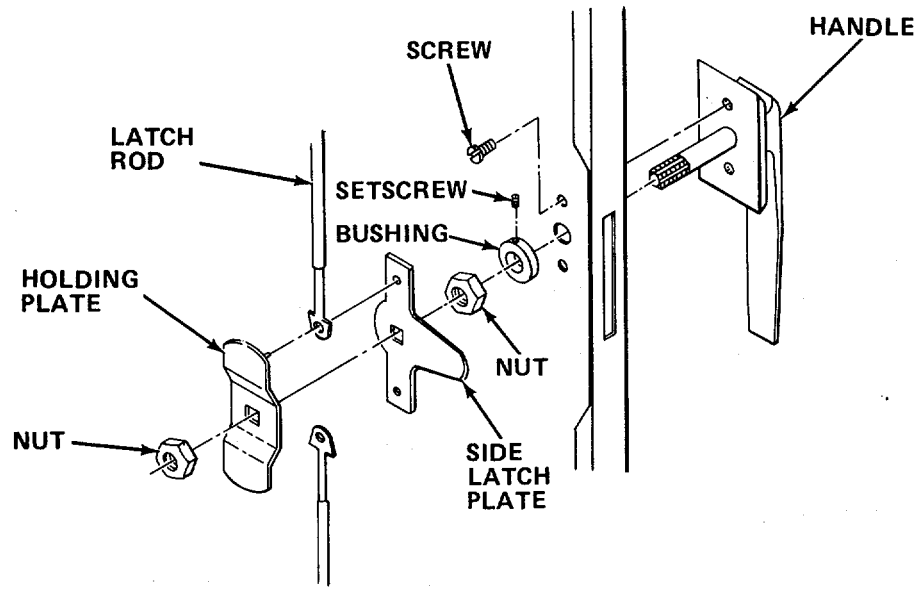
9-16.2 Replace Door Latch (Wall Storage Cabinet).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
 9/16 in. Combination Wrench
 Flat Tip Screwdriver

SUPPLIES: Handle Type Latch



- a. Remove holding plate retaining nut.
- b. Remove holding plate and latch rods.
- c. Remove side latch plate.
- d. Remove handle retaining nut.
- e. Loosen setscrew and remove bushing from handle shaft.
- f. Remove handle retaining screws and remove handle.
- g. Install new handle and secure with screws.
- h. Reinstall bushing on handle shaft and tighten setscrew.
- i. Reinstall handle retaining nut.
- j. Install side latch plate.
- k. Reinstall latch rod holding plates and latch rods.
- l. Reinstall holding plate retaining nut.

9-16.3. Replace Door Hinge.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair

1/4 in. Electric Drill

5/32 in. Drill Bit

Pop Rivet Gun

SUPPLIES: Storage Cabinet Hinge

5/32 in. Pop Rivets

8-32 x 1/2 in. Screws (4 required)

8-32 Nuts (4 required)

- a. Drill out rivets holding hinge to cabinet and remove hinge.
- b. Install new hinge and temporarily secure with four screws and nuts.
- c. Close and latch cabinet door and install pop rivets.
- d. Remove temporarily installed screws and nuts, and install pop rivets.

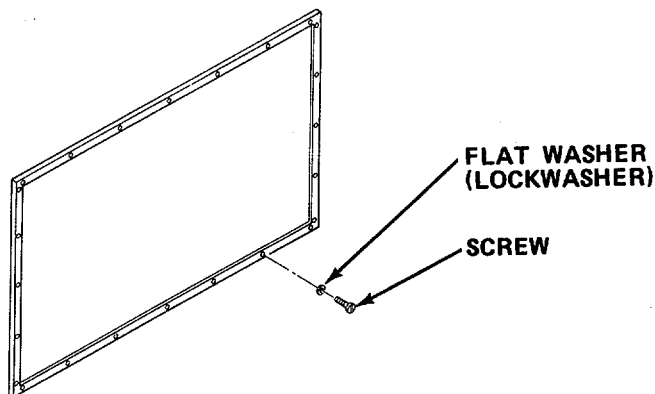
9-16.4. Remove/Install Corkboard.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair Cross Tip Screwdriver

SUPPLIES: Corkboard



- a. Remove attaching hardware securing defective corkboard to wall.
- b. Remove defective corkboard.
- c. Position new corkboard and aline mounting holes.
- d. Secure new corkboard to wall with attaching hardware.

9-16.5 Remove/Install Ten-Drawer Photolithographic Cabinet.

MOS: 83FJ6, Reproduction Equipment Repairer

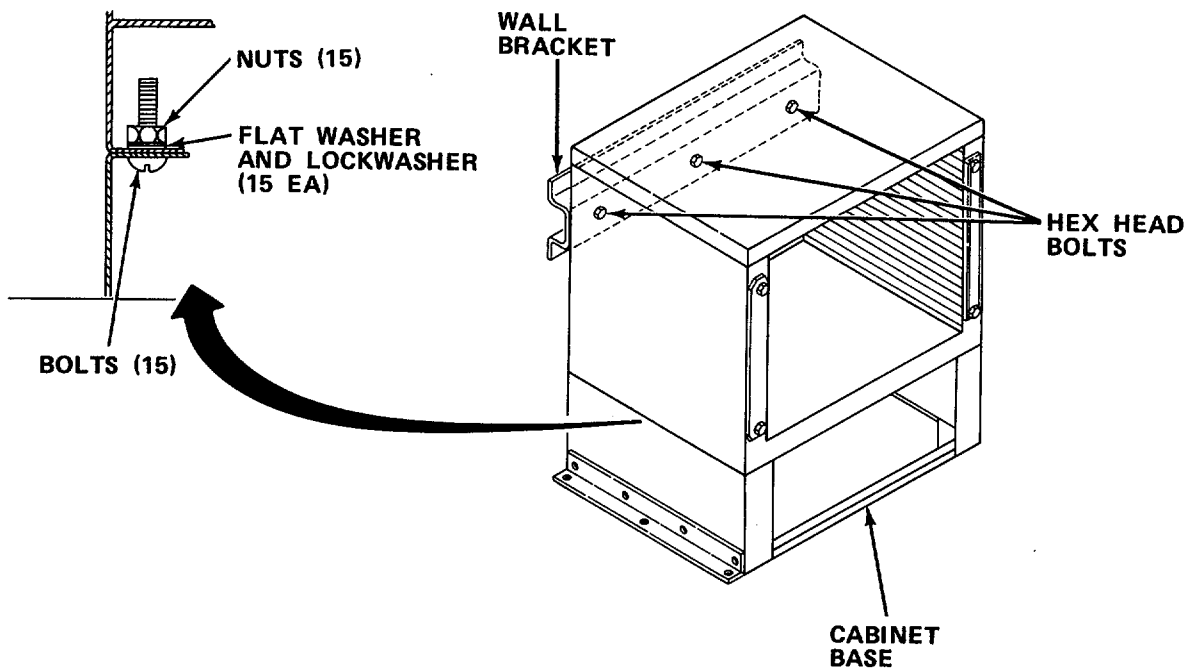
TOOLS:

- Tool Kit, Light Machine Repair
- Cross Tip Screwdriver
- 3/8 in. Combination Wrench
- 1/2 in. Socket
- 1/2 in. Drive Ratchet

SUPPLIES: 10-Drawer Photolithographic Cabinet

PERSONNEL: Two persons are required to perform this procedure.

- a. Remove contact vacuum frame from top of photolithographic cabinet (paragraph 6-16.11).
- b. Remove all drawers from photolithographic cabinet.



- c. Remove hex head bolts securing back of cabinet to wall bracket.
- d. Remove fifteen bolts, nuts, flat washers and lockwashers securing cabinet to the cabinet base.
- e. Remove defective photolithographic cabinet from van.
- f. Install new 10-drawer photolithographic cabinet and center evenly on cabinet base.
- g. Reinstall fifteen bolts, nuts, flat washers and lockwashers to secure cabinet to cabinet base.
- h. Reinstall three hex head bolts to secure back of cabinet to wall bracket.
- i. Reinstall drawers in cabinet.
- j. Reinstall contact vacuum frame (paragraph 6-16.11).

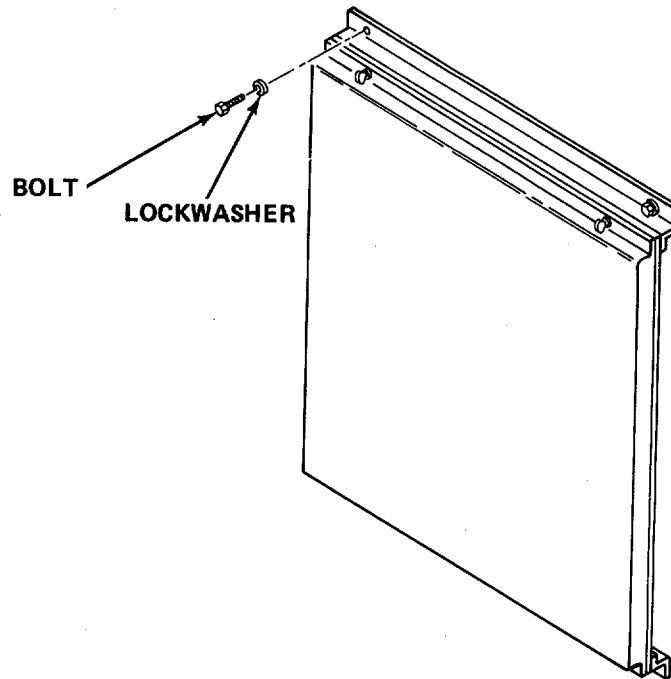
9-16.6 Remove/Install Glass Holder.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
Cross Tip Screwdriver

SUPPLIES: Glass Holder



- a. Remove cross head bolts and lockwashers securing defective glass holder to wall.
- b. Remove defective glass holder.
- c. Position new glass holder and secure to wall with lockwasher and bolts.

9-16.7 Remove/Install Vertical Plate Storage Cabinet.

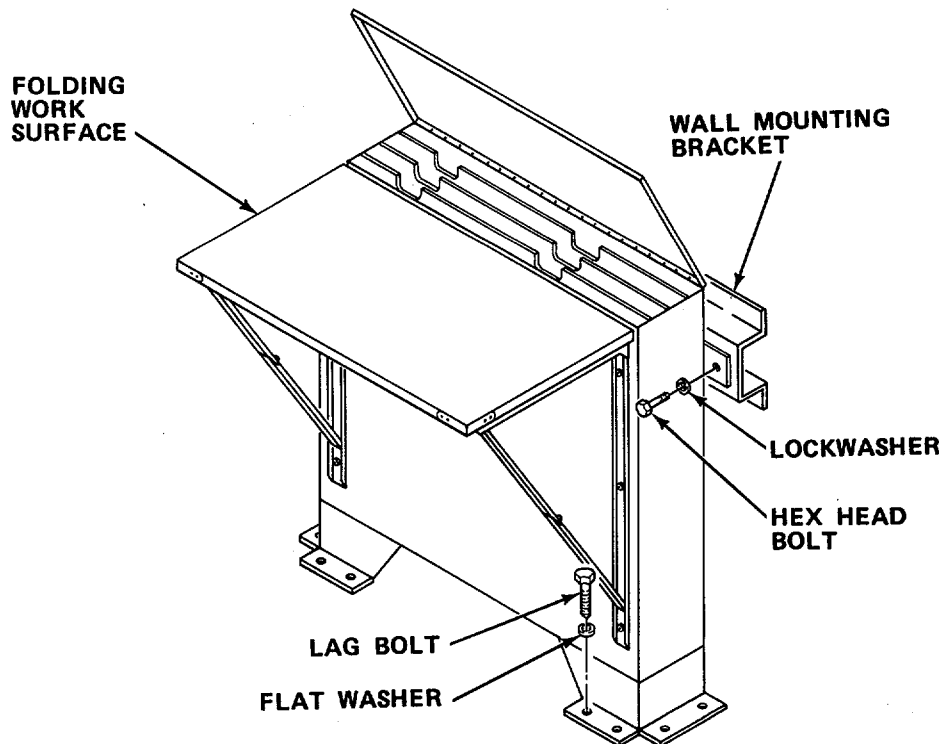
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
 1/2 in. Socket, 1/2 in. Drive
 1/2 in. Drive Ratchet

SUPPLIES: Vertical Plate Storage Cabinet

PERSONNEL: Two persons are required to perform this procedure.



- a. Remove eight lag bolts and flat washers securing plate storage cabinet to floor.
- b. Remove two hex head bolts and lockwashers securing cabinet to wall mounting bracket.

WARNING

The vertical plate storage cabinet is heavy and awkward to handle. Severe personal injury may result unless two persons are used to move the cabinet.

- c. Remove defective cabinet from van.
- d. Install new cabinet, and secure to wall mounting bracket with hex head bolts and lockwashers. Do not tighten bolts.
- e. Secure plate storage cabinet to floor with lag bolts and flat washers.
- f. Tighten hex head bolts securing cabinet to wall mounting bracket.

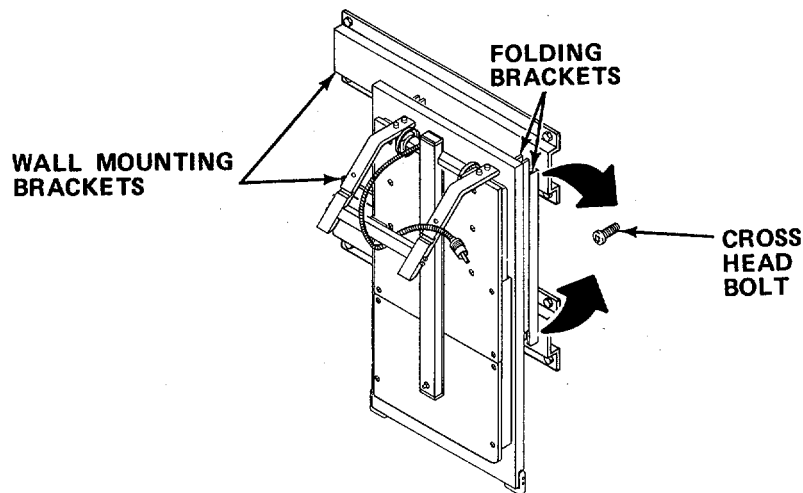
9-16.8 Remove/Install Folding Transmission Probe Table.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
Cross Tip Screwdriver

SUPPLIES: Folding Work Surface



- a. Raise folding transmission probe table to in-use position, parallel to floor.
- b. Remove four cross head bolts securing folding brackets to van's wall mounting brackets.
- c. Remove defective folding transmission probe table.
- d. Install new transmission probe table and secure to wall mounting brackets with four cross head bolts through folding brackets.

NOTE

To remove transmission probe from folding table, refer to paragraph 7-16.19.

9-16.9 Remove/Install Folding Work Surface on Plate Storage Cabinet.

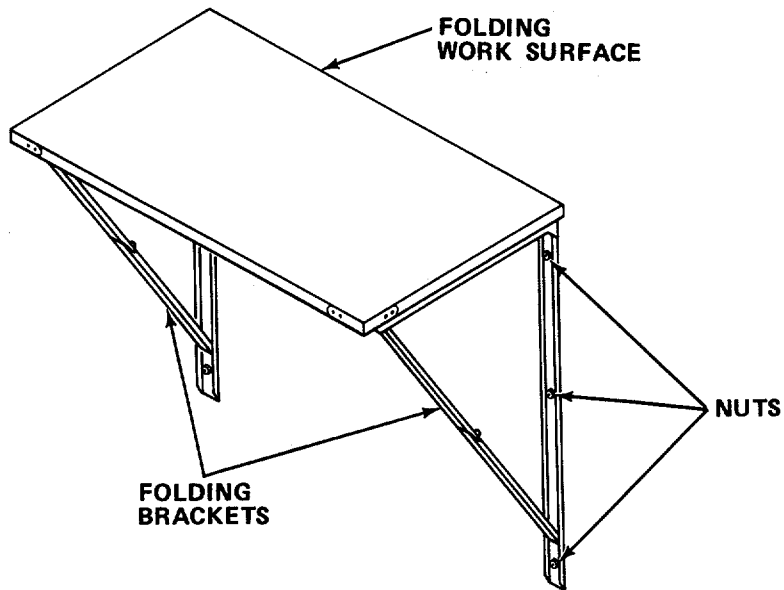
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
 3/8 in. Nut Driver

SUPPLIES: Folding Work Surface

- a. Raise folding work surface to in-use position.



- b. Remove six nuts securing work surface folding brackets to plate storage cabinet.
- c. Remove defective work surface.
- d. Install new work surface, centering holes in folding brackets on studs in plate storage cabinet.
- e. Reinstall six nuts.

9-16.10 Remove/Install Folding Work Surface.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
Cross Tip Screwdriver

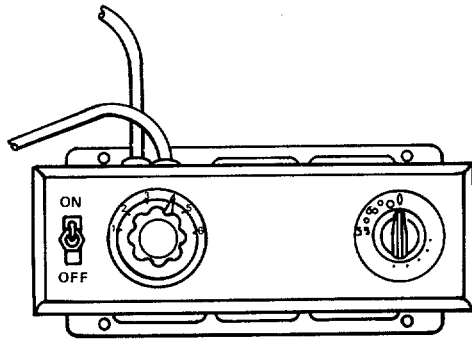
SUPPLIES: Folding Work Surface

- a. Raise work surface to in-use position.
- b. Remove six screws securing work surface folding brackets to wall of van.
- c. Remove defective work surface.
- d. Install new folding work surface, and secure to van wall with six screws through folding brackets.

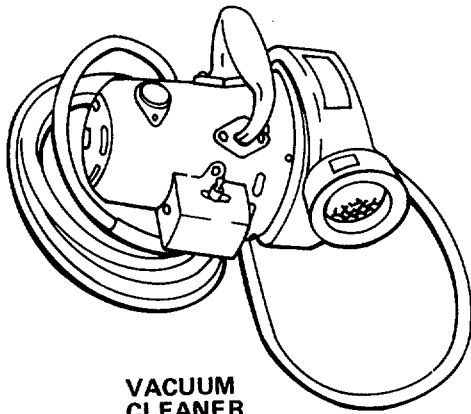
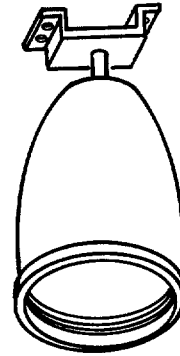
9-17. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

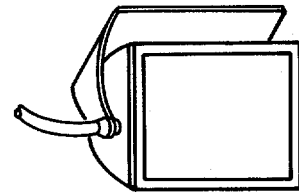
There are no direct/general support maintenance procedures assigned for this equipment.



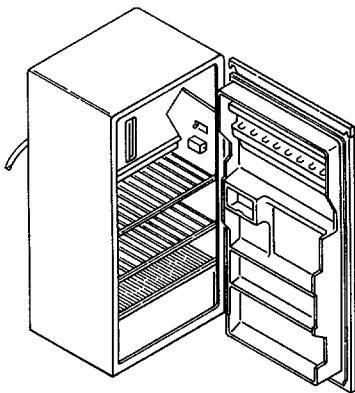
**CONTACT PRINTING LAMP
AND CONTROL BOX**



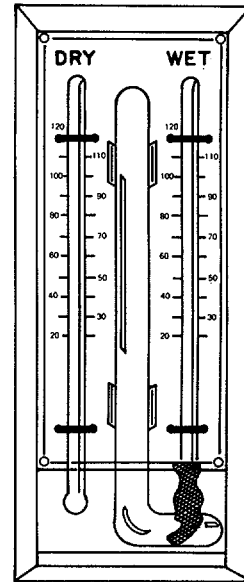
**VACUUM
CLEANER**



**PHOTOGRAPHIC
DARKROOM
SAFELIGHT**



REFRIGERATOR



PSYCHROMETER

CHAPTER 10**SUPPORT ITEMS****Section I. INTRODUCTION****10-1. GENERAL INFORMATION.**

10-1.1 Scope. This chapter covers the support items contained in this section. The support items consist of the following equipment:

- a. Model TA11SB Refrigerator.
- b. Model 141-2261 Darkroom Safelight.
- c. Model CP25 Contact Printing Lamp and Timer/Power Supply Control Box.
- d. Model 314 Mason-Type Psychrometer.
- e. Model 3400 Vacuum Cleaner.

10-2. EQUIPMENT DESCRIPTION.10-2.1 Equipment Characteristics, Capabilities and Features.

- a. Refrigerator. Provides controlled storage for photographic materials.
- b. Darkroom Safelight. Provides special illumination for use in darkroom.
- c. Contact Printing Lamp and Timer/Power Supply Control Box.
 - (1) Pinpoint light source.
 - (2) Adjustable beam.
 - (3) Filter holder for standard 3 inch filters.
 - (4) Reset timer assures repeat exposures.
 - (5) Intensity control for intensity variations.
 - (6) Used in conjunction with contact vacuum frame.
- d. Mason-Type Psychrometer. Determines relative humidity. Provides direct reading and is wall mounted.
- e. Vacuum Cleaner. Used for general cleaning purposes. High speed, heavy duty.

10-2.2 Equipment Data.

- a. Refrigerator. Single Door, 10.6 cu ft capacity, 120 V, 60 Hz power.
- b. Darkroom Safelight. 120 V, 60 Hz with filter.
- c. Contact Printing Lamp and Timer/Power Supply Control Box. 120 V, 60 Hz for control box, 20 V 100 W lamp.
- d. Mason-Type Psychrometer. Is water activated, 9 in. (22.8 cm) in length and 4 in. (10.1 cm) wide.
- e. Vacuum Cleaner. 115 V, 60 Hz. Packed in storage box containing hose, various vacuum and blowing attachments, liquid spray attachments, and motor repair kit containing motor bearings and brushes.

10-3. TECHNICAL PRINCIPLES OF OPERATION. Principles of operation are combined with operator's controls and indicators, with exception of the Mason-Type Psychrometer.

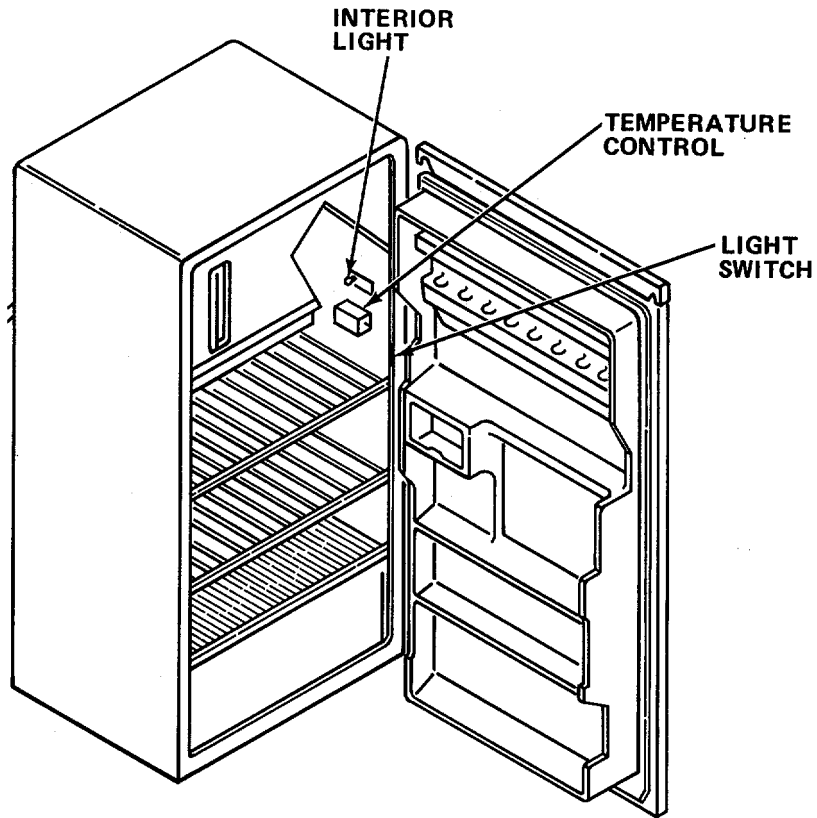
a. The Mason-type psychrometer is an instrument consisting of two thermometers used in the measurement of the moisture content (humidity) of air or other gases. The bulb of one of the thermometers is covered by a thin piece of muslin cloth (wick) wetted uniformly with distilled water. The temperatures of both the bulb and the air contacting the bulb are lowered by evaporation which takes place when unsaturated air moves past the wetted bulb. An equilibrium temperature, called the wet-bulb temperature, will be reached; it closely approaches the lowest temperature to which air can be cooled by evaporation of water into that air.

b. The water vapor content of the air surrounding the wet bulb can then be determined by calculating the difference between the wet bulb temperature and the dry bulb temperature. The final determination is known as relative humidity, or the amount of moisture in the air as compared with the maximum amount that the air could contain at the same temperature. Relative humidity is expressed as a percentage. Where the dry bulb and wet bulb temperatures are the same, the atmosphere is saturated.

Section II OPERATING INSTRUCTIONS

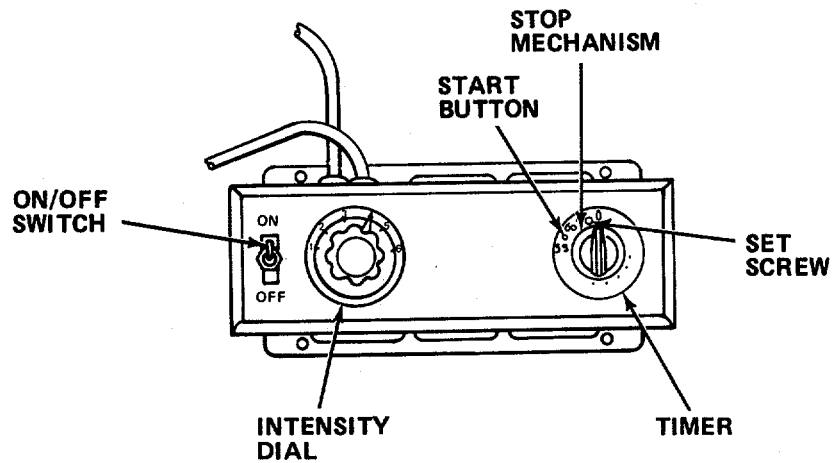
10-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.

10-4.1 Refrigerator.



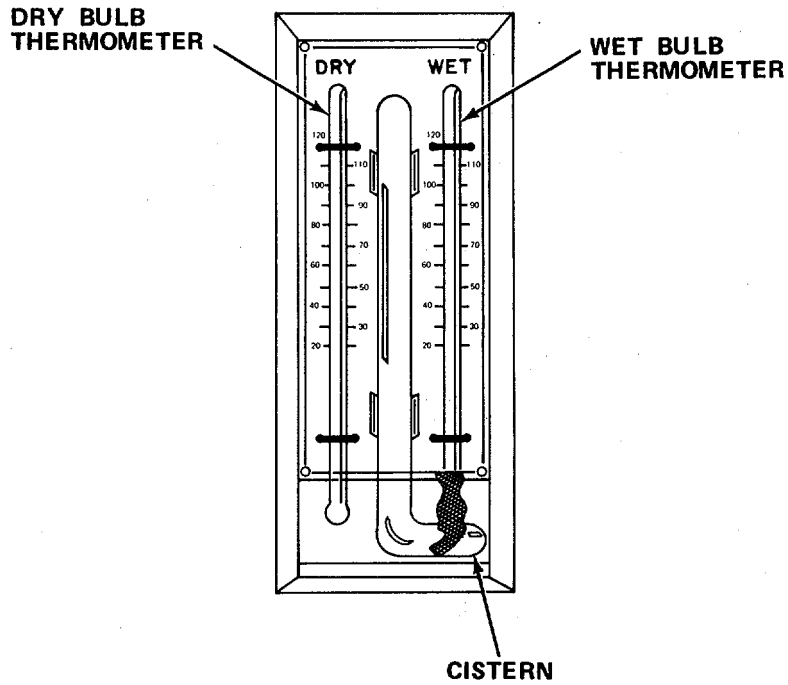
CONTROL OR INDICATOR	FUNCTION
Temperature Control	Regulates operation of compressor to maintain desired temperature.
Light Switch	Turns interior light on when door is opened; turns light off when door is shut.

10-4.2 Contact Printing Lamp and Timer/Power Supply Control Box.



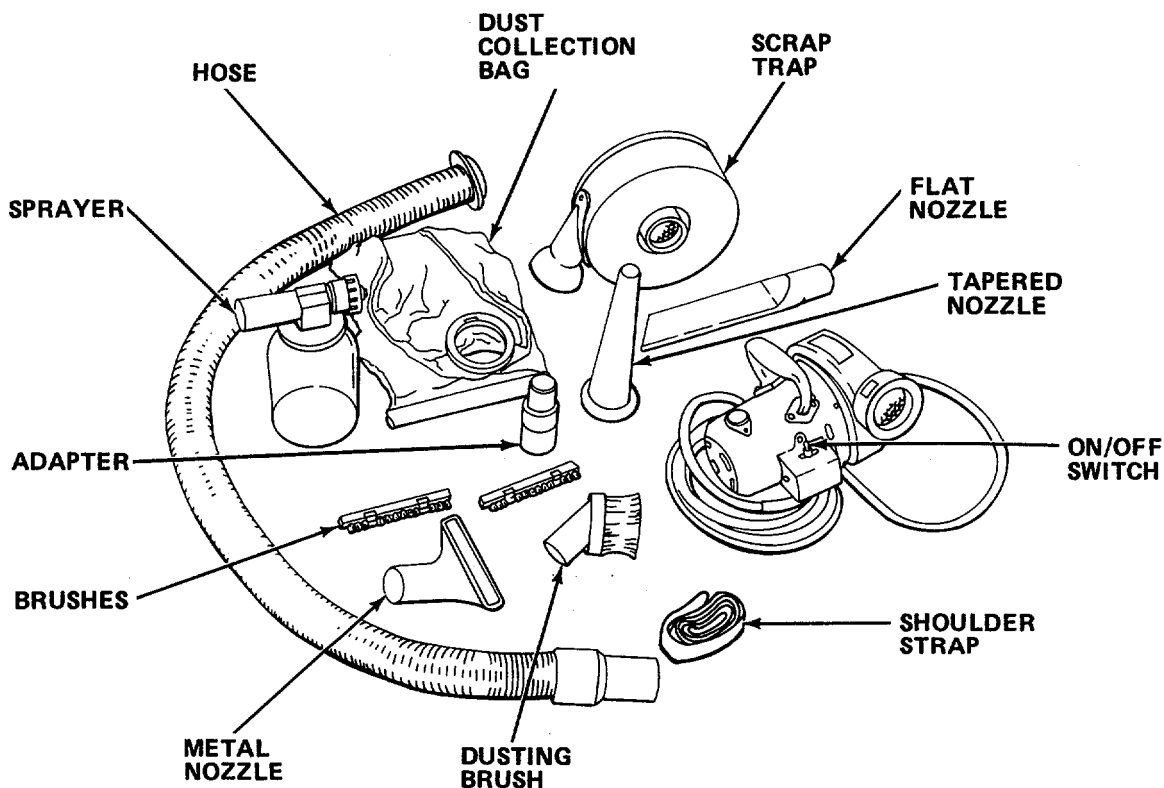
CONTROL OR INDICATOR	FUNCTION
On-Off Switch	Applies power to transformer and timer.
Intensity Dial	Selects the intensity level for the lamp. The intensity dial has six different settings. Each setting is approximately twice as intense as the previous setting. (For example, a setting of 3 has twice the intensity as a setting of 2.)
Timer	Selects exposure time. If setting timer for 10 seconds or less, you must turn time knob past second setting, and then turn it back to desired setting.
Stop Mechanism	Used to set a timer position to prevent setting timer any higher than where stop is positioned.
Start Button	Used to activate timer. Located between 55 and 60 second digits on timer dial.

10-4.3 Mason-Type Psychrometer.



CONTROL OR INDICATOR	FUNCTION
WET Bulb Thermometer	Measures temperature of wick in Fahrenheit.
Cistern	Contains water to keep wick on WET bulb thermometer completely saturated.
DRY Bulb Thermometer	Measures air temperature in Fahrenheit.

10-4.4 Vacuum Cleaner.



CONTROL OR INDICATOR

FUNCTION

Sprayer	Sprays liquids when hooked to blower side of vacuum cleaner.
Flexible Hose	Directs airflow to hard-to-reach areas.
Dust Collection Bag	Collects and holds dust and dirt.
Scrap Trap	Traps large particles before they enter fan.
Flat Nozzle	Used for hard-to-reach areas.
Tapered Blower Nozzle	Directs airflow.
On/Off Switch	Turns power on or off.

CONTROL OR INDICATOR	FUNCTION
Shoulder Strap	Attaches to vacuum cleaner for easier carrying.
Round Dusting Brush	Used for light dust and dirt.
Metal Nozzle	Used for large, flat surfaces.
Brushes	Used on metal nozzle.
Adapter	Connects various attachments to hose.

10-5. 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.

10-5.1 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 column. 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:

<u>Item</u>	<u>Quantity</u>
Cheesecloth (Item 14, Appendix E)	ar
Detergent (Item 16, Appendix E)	ar
Vacuum Cleaner	1 ea

Table 10-1. 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 W - Weekly AN - Annually (Number) - Hundreds of Hours
 D - During M - Monthly S - Semiannually
 A - After Q - Quarterly BI - Biennially

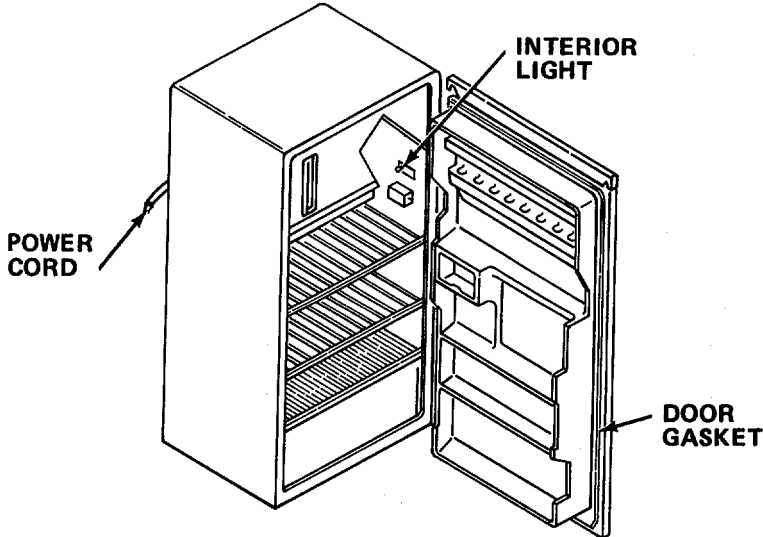
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
1	M	<p><u>SUPPORT ITEMS</u></p> <p><u>Inspect Refrigerator.</u></p> <ol style="list-style-type: none"> 1. Unplug power cord. 2. Visually inspect power cord and plug for kinks, frayed or broken wires, rips, discolored covering, or cracked plug.  <ol style="list-style-type: none"> 3. Inspect unit for loose or missing parts. 4. Replace or tighten as required. 5. Plug in power cord. 6. Check that interior light comes on when door is open. 	<p>Power cord is kinked, frayed, or ripped or has broken wires, discolored covering or cracked plug.</p>

Table 10-1. 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:
1	M	<p><u>SUPPORT ITEMS - Cont</u></p> <p><u>Inspect Refrigerator - Cont</u></p> <p>7. Check that door gasket is not cracked or torn, and that it forms a complete seal all around door.</p>	<p>Door gasket is cracked, torn, or does not form a complete seal all around door.</p>
2	Q	<p><u>Service Refrigerator.</u></p> <p>1. Wipe exterior and interior with cheesecloth moistened in mild solution of detergent and water.</p> <p>2. Vacuum coils.</p>	
3	B	<p><u>Inspect Darkroom Safelight.</u></p> <div style="text-align: center;"> </div> <p>1. Inspect filter and housing for cracks, breaks, and dirt. Clean outside of filter as required.</p>	

Table 10-1. 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

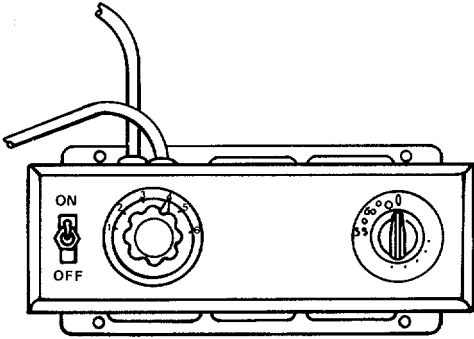
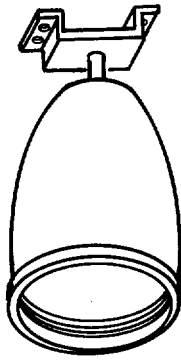
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
3	B	<p><u>SUPPORT ITEMS - Cont</u></p> <p><u>Inspect Darkroom Safelight - Cont</u></p> <p>2. Remove filter. Inspect inside of filter and interior of darkroom safelight for cracks, breaks, and dirt. Clean interior of safelight and inside of filter as required.</p>	Safelight housing is cracked or broken.
4	B/D	<p><u>Inspect Contact Printing Lamp.</u></p> <p style="text-align: center;">WARNING</p> <p>Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>1. Unplug power cord for timer/power supply control box.</p> <p>2. Inspect power cord going to control box for broken wires, frayed insulation, or damaged plug.</p>	Plug damaged, tion, or broken wires.

Table 10-1. 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:
4	B/D	<p><u>SUPPORT ITEMS - Cont</u></p> <p>Inspect Contact Printing Lamp - Cont</p> <ol style="list-style-type: none"> 3. Inspect power cord going to lamp for broken wires, frayed insulation, or damaged plug. 4. Plug in power cord for timer/power supply control box. 5. Turn on power switch for timer/power supply control box. 6. Be sure lamp power cord is plugged into control box. 7. Set intensity dial to 1. 8. Set timer to 55 seconds. Timer cannot be set. 9. Press start button and verify lamp lights dimly. 10. Change intensity dial slowly, increasing the intensity until dial reaches 6. 11. Verify that lamp turns off after time elapses. 12. Turn off power switch for timer/power supply control box. 	<p>Plug damaged, frayed insulation, or broken wires.</p> <p>Dial cannot be set.</p> <p>Lamp does not light.</p> <p>Lamp does not increase in intensity for each setting.</p> <p>Lamp does not turn off.</p>
5	W	<p><u>Inspect Mason-Type Psychrometer.</u></p> <ol style="list-style-type: none"> 1. Inspect thermometers for damage. are damaged. 	<p>Thermometers</p>

Table 10-1. 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

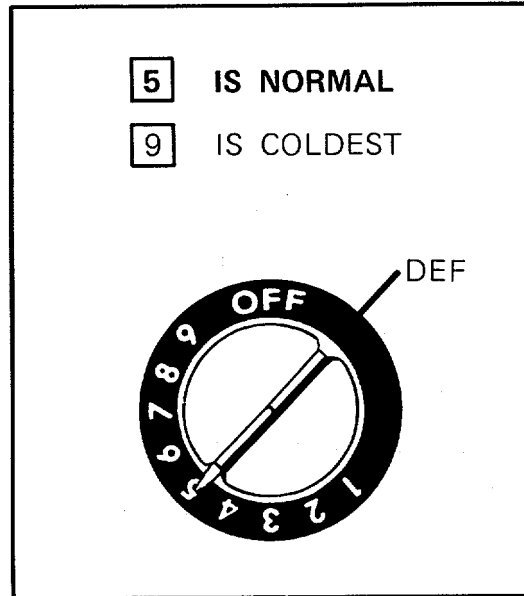
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting Equipment Is Not Ready/ Available If:
5	W	<p><u>SUPPORT ITEMS - Cont</u></p> <p>Inspect Mason-Type Psychrometer - Cont</p> <ol style="list-style-type: none"> 2. Check that wick is clean and completely saturated with distilled water. 3. Check that cistern is filled with distilled water. <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Mounting psychrometer near heat sources, fans, or air conditioning supply and exhaust vents will cause psychrometer to indicate incorrect air temperatures.</p> <ol style="list-style-type: none"> 4. Mount psychrometer on wall. 	Cistern is dry.
6	Q	<p><u>Vacuum Cleaner.</u> Inspect vacuum cleaner for damage to housing, frayed or worn power cord, and proper operation of motor.</p>	Housing is cracked or broken. Power cord is frayed, worn or damaged. Motor is noisy or operates improperly.

10-6. OPERATION UNDER USUAL CONDITIONS.

10-6.1 Operating Procedures.

a. Refrigerator.

- (1) Plug in power cord.

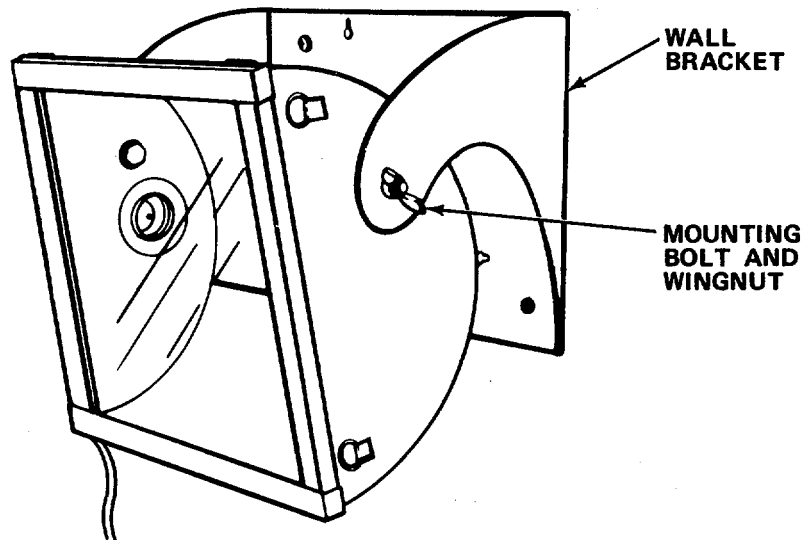


- (2) Set temperature control to midrange.

b. Darkroom Safelight.

NOTE

Darkroom safelight is operated by plugging power cord into wall outlet. Light will remain on as long as power cord is plugged in.



(1) Changing filter.

- (a) Unplug power cord.
- (b) Open latch.
- (c) Lower cover.
- (d) Select proper filter.
- (e) Place filter glass inside so that filter identification can be read from outside.
- (f) Close and latch cover.
- (g) Plug in power cord.

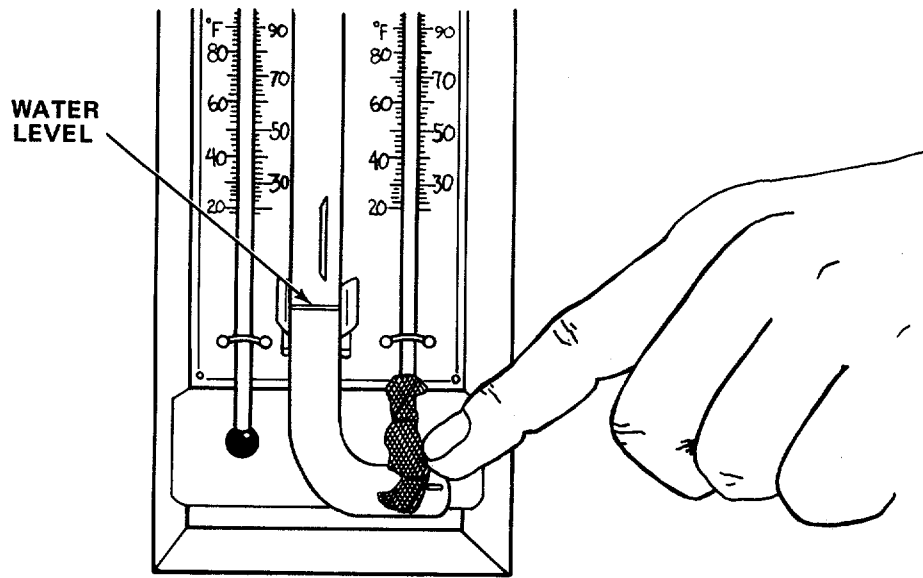
(2) Positioning safelight.

- (a) Loosen wingnuts on mounting bolts holding safelight in place
- (b) Position safelight so that it provides desired illumination. For direct illumination, safelight should face work area. For indirect illumination, it should face wall.

- (c) Tighten wingnuts on mounting bolts holding safelight in place.
- c. Contact Printing Lamp and Timer/Power Supply Control Box. Refer to Chapter 6, Contact Vacuum Frame, paragraph 6-6.
- d. Mason-Type Psychrometer.

NOTE

Be sure psychrometer is not close to fan, heater, open door, or ventilation duct.



- (1) Check that water level in cistern is halfway between brackets.
- (2) Add distilled water to saturate wick and fill cistern when necessary.
- (3) Mount psychrometer on hook on wall.
- (4) Wait five minutes before recording WET and DRY bulb readings.

(5) Convert WET and DRY bulb thermometer readings to relative humidity as follows:

Air Temperature (DRY Bulb): 68 ° F

WET Bulb: 62 ° F

Depression = DRY Bulb (t) WET Bulb (tl) = 68°F 62°F = 6°F

Depression = 6 ° F

Use left column to find air temperature of 68 ° F.

Use top column to find depression of 6 ° F.

The intersection of both columns gives the percent of relative humidity, in this case 71%

Table 1-2. Relative Humidity, Per Cent - Fahrenheit Temperatures

PRESSURE EQUALS 30.0 INCHES

AIR TEMP	DEPRESSION OF WET-BULB THERMOMETER t-t1																					
	t 11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	20.5	21.0	
35	2																					
36	5	1																				
37	7	3																				
38	10	6	2																			
39	12	9	5	1																		
40	16	11	7	4	0																	
41	17	13	10	6	3																	
42	19	16	12	9	5	2																
43	21	18	14	11	8	4	1															
44	23	20	16	18	10	7	4	0														
45	25	22	18	15	12	9	6	3														
46	26	23	20	17	14	11	8	5	2													
47	28	25	22	19	16	18	10	7	5	2												
48	29	26	23	21	18	15	12	9	7	4	1											
49	31	28	25	22	19	17	14	11	9	6	3	1										
50	32	29	27	24	21	18	16	13	10	8	5	3	0									
51	34	31	28	26	23	20	17	15	12	9	7	4	2									
52	35	32	29	27	24	22	19	17	14	11	9	6	4	1								
53	36	33	31	28	26	23	20	18	16	13	10	8	6	3	1							
54	37	35	32	29	27	24	22	20	17	15	12	10	8	5	3	1						
55	38	36	33	31	28	26	23	21	19	16	14	12	9	7	5	2	0					
56	39	37	34	32	30	27	25	22	20	18	16	18	11	9	7	4	2					
57	40	38	35	33	31	28	26	24	22	19	17	15	13	10	8	6	4	2				
58	41	39	37	34	32	30	27	25	23	21	18	16	14	12	10	8	6	3	1			
59	42	40	38	35	33	31	29	26	24	22	20	18	16	13	11	9	7	5	3	1		
60	43	41	39	37	34	32	30	28	26	23	21	19	17	15	13	11	9	7	5	3	1	
61	44	42	40	38	35	33	31	29	27	25	22	20	18	16	14	12	10	8	7	5	3	
62	45	43	41	39	36	34	32	30	28	26	24	22	20	18	16	14	12	10	8	6	4	
63	46	44	42	40	37	35	33	31	29	27	25	23	21	19	17	15	13	11	10	8	6	
64	47	45	43	41	38	36	34	32	30	28	26	24	22	20	18	17	15	13	11	9	7	
65	48	46	44	41	39	37	35	33	31	29	27	25	24	22	20	18	16	14	12	11	9	
66	48	46	44	42	40	38	36	34	32	30	29	27	25	23	21	19	17	16	14	12	10	
67	49	47	45	43	41	39	37	35	33	31	30	28	26	24	22	20	19	17	15	13	12	
68	50	48	46	44	42	40	38	36	34	32	31	29	27	25	23	21	20	18	16	15	13	
69	51	49	47	45	43	41	39	37	35	33	32	30	28	26	24	23	21	19	18	16	14	
70	51	49	48	46	44	42	40	38	36	34	33	31	29	27	25	24	22	20	19	17	15	
71	52	50	48	46	45	43	41	39	37	35	33	32	30	28	27	25	23	22	20	18	17	
72	53	51	49	47	45	43	42	40	38	36	34	33	31	29	28	26	24	23	21	19	18	
73	53	51	50	48	46	44	42	40	39	37	35	34	32	30	29	27	25	24	22	20	19	
74	54	52	50	48	47	45	43	41	39	38	36	34	33	31	29	28	26	26	23	21	20	

Table 1-2. Relative Humidity, Per Cent - Fahrenheit Temperatures - Cont
PRESSURE EQUALS 30.0 INCHES

Table with columns: AIR TEMP, DEPRESSION OF WET-BULB THERMOMETER t-t1, and a grid of values for temperatures from 20 to 76 and depressions from 0.5 to 10.5.

e. Vacuum Cleaner.

(1) Using as vacuum.

- (a) Attach dust collection bag to air discharge opening.
- (b) Remove protective screen lock from air intake opening and attach scrap trap to that opening.
- (c) Attach swivel end of hose to scrap trap by turning lock to right until secure.
- (d) Attach required tool to other end of hose.
- (e) Insert plug into 120 V ac wall outlet and turn on/off switch to on.

(2) Using as blower.

- (a) Attach tapered rubber nozzle to discharge opening.
- (b) Attach protective screen lock to air intake opening.
- (c) Insert plug into 120 V ac wall outlet and position on/off switch to on.

10-7. OPERATION UNDER UNUSUAL CONDITIONS . This equipment is designed for use only in a controlled environment.

Section III OPERATOR MAINTENANCE

10-8. LUBRICATION INSTRUCTIONS . This equipment does not require lubrication.

10-9. TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during operation or maintenance of the support items. 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 10-3. TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. REFRIGERATOR LAMP WILL NOT LIGHT.		
Step 1. Check for defective lamp.		
(a) Replace lamp (paragraph 10-10.1). (b) If lamp is not burned out, proceed to step 2.		
Step 2. Check power cord.		
(a) If plugged in, proceed to step 3. (b) Plug in power cord.		
Step 3. Check circuit breaker position in circuit breaker box.		
(a) If circuit breaker on, proceed to step 4. (b) If circuit breaker off or tripped, turn circuit breaker on.		
Step 4. Check door activated light switch.		
(a) If switch is stuck, free-switch. (b) If switch is defective, replace switch (paragraph 10-16.5).		
2. DARKROOM SAFELIGHT WILL NOT LIGHT.		
Step 1. Check power cord.		
(a) If plugged in, proceed to step 2. (b) Plug in power cord.		
Step 2. Check circuit breaker position in circuit breaker box.		
(a) If circuit breaker ON, proceed to step 3. (b) If circuit breaker off or tripped, turn circuit breaker ON.		

Table 10-3. TROUBLESHOOTING-Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. DARKROOM SAFELIGHT WILL NOT LIGHT-Cont	Step 3. Check for defective lamp.	<ul style="list-style-type: none"> (a) Replace lamp (paragraph 10-10.2). (b) If new lamp does not correct problem, refer to organizational maintenance.
3. VACUUM CLEANER MOTOR DOES NOT OPERATE.	Step 1. Check power cord.	<ul style="list-style-type: none"> (a) If plugged in, proceed to step 2. (b) Plug in power cord.
	Step 2. Check position of power switch.	<ul style="list-style-type: none"> (a) If turned on, proceed to step 3. (b) Turn power switch on.
	Step 3. Check circuit breaker position in circuit breaker box.	<ul style="list-style-type: none"> (a) If turned off or tripped, turn circuit breaker on. (b) If turned on, refer to supervisor.
	Step 4. Check that vacuum cleaner is plugged into active outlet. Turn switch on.	If motor does not operate, replace vacuum cleaner.
4. CONTACT PRINTING LAMP WILL NOT LIGHT.	Step 1. Check power cord.	<ul style="list-style-type: none"> (a) If plugged in, proceed to step 2. (b) Plug in power cord.

Table 10-3. TROUBLESHOOTING-Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
4. CONTACT PRINTING LAMP WILL NOT LIGHT-Cont	Step 2. Check circuit breaker position in circuit breaker box.	(a) If circuit breaker ON, proceed to step 3. (b) If circuit breaker off or tripped, turn circuit breaker ON.
	Step 3. Check for defective lamp.	(a) Replace lamp (paragraph 10-10.3). (b) If new lamp does not correct problem, replace contact printing lamp and timer control box.
5. WET AND DRY BULB TEMPERATURE READINGS ARE CONSTANTLY IDENTICAL.	Lack of water in cistern.	Add distilled water.
6. WET BULB READINGS DO NOT AGREE WITH OTHER PSYCHROMETERS.	Step 1. Dirty wick.	Clean cistern, replace wick, and add distilled water.
	Step 2. Thermometer(s) have shifted on scale.	Replace psychrometer.

10-10. MAINTENANCE PROCEDURES.

a. This section contains instructions covering operator maintenance functions for the support items. 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

PROCEDURE	PARAGRAPH
Replace Refrigerator Interior Lamp	10-10.1
Replace Darkroom Safelight Lamp.....	10-10.2
Replace Contact Printing Lamp.....	10-10.3
Replace Psychrometer Wick	10-10.4

10-10.1 Replace Refrigerator Interior Lamp.

MOS: 83E, Photo and Layout Specialist

TOOLS: None Required

SUPPLIES: 40 W Lamp

WARNING

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

- a. Unplug power cord.
- b. Remove defective lamp.
- c. Install new 40 W lamp.
- d. Plug in power cord.

10-10.2 Replace Darkroom Safelight Lamp.

MOS: 83E, Photo and Layout Specialist

TOOLS: None Required

SUPPLIES: Lamp

WARNING

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

- a. Unplug power cord.
- b. Remove defective lamp.
- c. Install new lamp.
- d. Plug in power cord.

10-10.3 Replace Contact Printing Lamp.

MOS: 83E, Photo and Layout Specialist

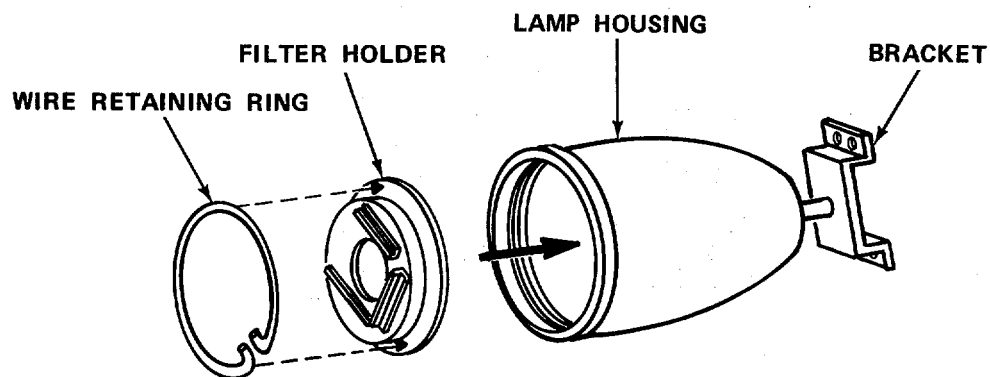
TOOLS: None Required

SUPPLIES: Contact Printing Lamp

WARNING

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

- a. Unplug power cord for timer/power supply control box.



- b. Press in on wire retaining ring and remove it.
- c. Remove filter holder.
- d. Remove defective lamp.
- e. Install new lamp.
- f. Insert filter holder into bottom of lamp housing.
- g. Squeeze wire retaining ring and insert it on top of filter holder.
- h. Release wire retaining ring so ring snaps into place and locks filter holder into position.
- i. Plug in power cord for timer/power supply control box.

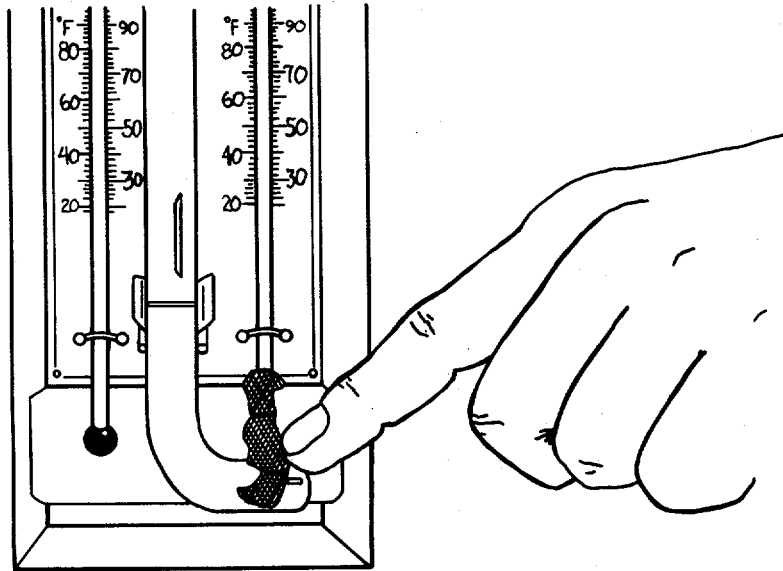
10-10.4 Replace Psychrometer Wick.

MOS: 83E, Photo and Layout Specialist

TOOLS: None required

SUPPLIES: Psychrometer Wick

- a. Remove psychrometer from wall.



- b. Remove wick from WET bulb thermometer and cistern.
- c. Install new wick over WET bulb thermometer.
- d. Fill cistern with clean, distilled water.
- e. Insert other end of wick into cistern.
- f. Saturate wick with distilled water.
- g. Mount psychrometer on wall.

Section IV ORGANIZATIONAL MAINTENANCE

10-11. LUBRICATION INSTRUCTIONS . This equipment does not require lubrication.

10-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT.

10-12.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

10-12.2 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.

10-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-3610-285-24P covering organizational maintenance for this equipment.

10-13. SERVICE UPON RECEIPT.

10-13.1 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.

10-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES . There are no organizational PMCS procedures assigned for this equipment.

10-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES. There are no organizational troubleshooting procedures assigned for this equipment.

10-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the support items. 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

PROCEDURE	PARAGRAPH
Replace Refrigerator Temperature Control.....	10-16.1
Replace Refrigerator Door Gasket.....	10-16.2
Remove/Install Refrigerator	10-16.3
Remove/Install Darkroom Safelight.....	10-16.4
Replace Refrigerator Light Switch	10-16.5

10-16.-1 Replace Refrigerator Temperature Control.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

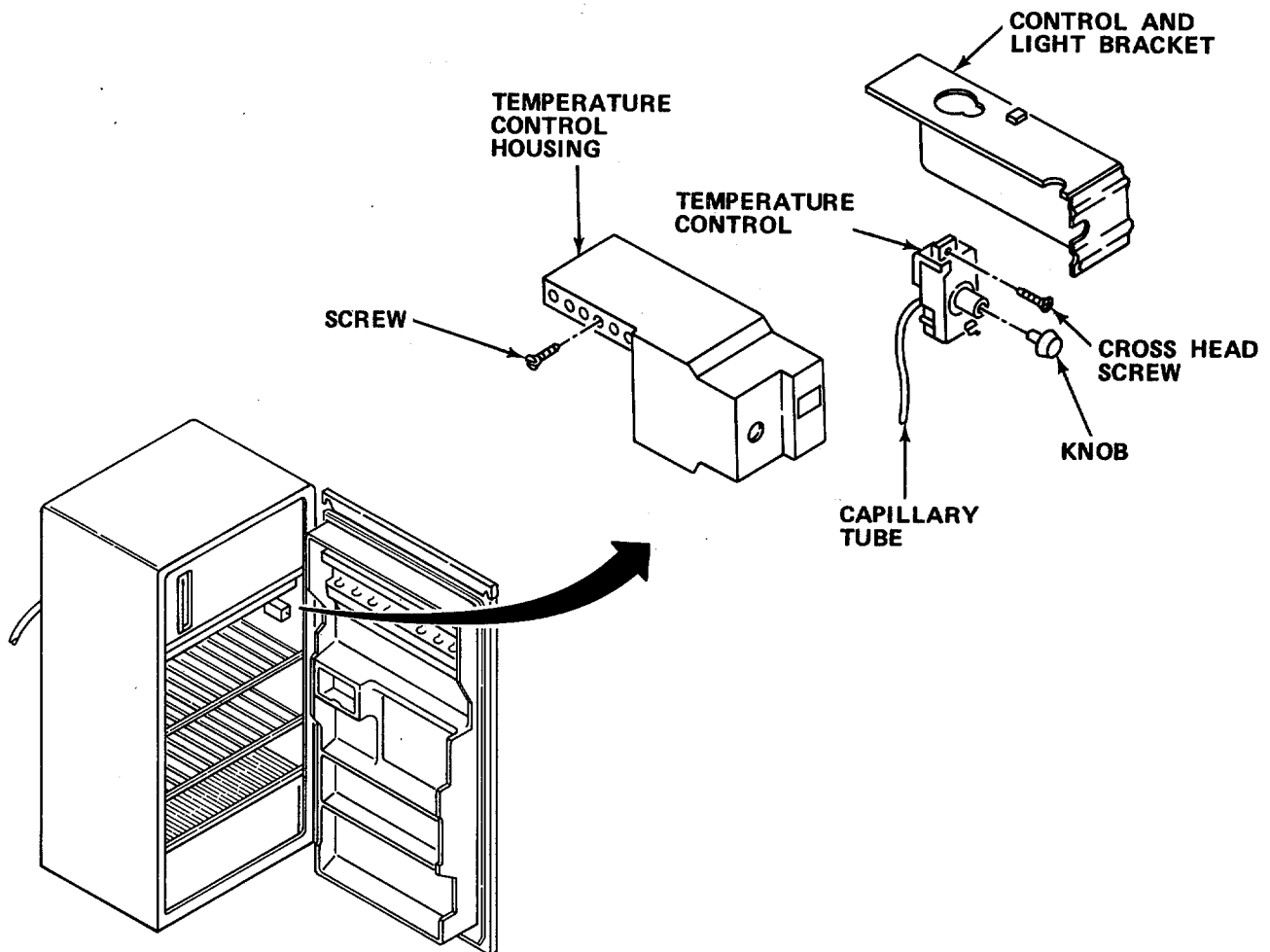
Tool Kit, Light Machine Repair
Cross Tip Screwdriver

SUPPLIES: Temperature Control

WARNING

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

- a. Unplug power cord.



- b. Remove knob from temperature control.
- c. Remove screws from temperature control housing.

NOTE

Note location of temperature control capillary tube.

- d. Remove housing from control bracket.
- e. Remove screws securing temperature control to housing and discard defective temperature control.
- f. Install new temperature control in housing and secure with screws.
- g. Replace housing on control bracket and secure with screws.

CAUTION

Capillary tube is fragile and should be handled with care to avoid damage.

- h. Place capillary tube in position previously noted.
- i. Replace temperature control knob and set to OFF.
- j. Plug in power cord.
- k. Turn on temperature control and set to desired temperature.

10-16.2 Replace Refrigerator Door Gasket.

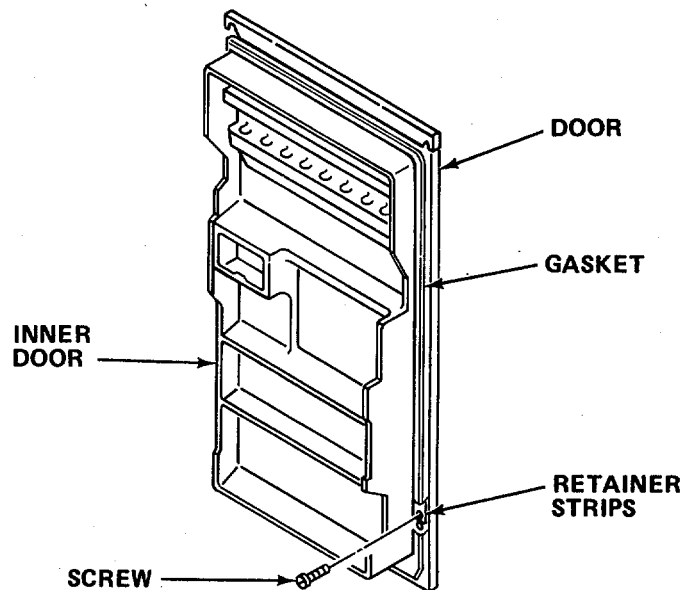
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
1/4 in. Drive Socket Set

SUPPLIES: Door Gasket

- a. Turn OFF refrigerator temperature control.



- b. Loosen screws securing inner door panel and retainer strips to door. Do not remove screws.
- c. Allow inner door panel and retainer strips to "float".
- d. Remove and discard door gasket.
- e. Place new gasket in position on door.
- f. Tighten screws securing inner door panel and retainer strips over gasket.
- g. Check that gasket forms a complete seal around door.
- h. Turn on temperature control and set to desired temperature.

10-16.3 Remove/Install Refrigerator.

MOS: 83FJ6, Reproduction Equipment Repairer

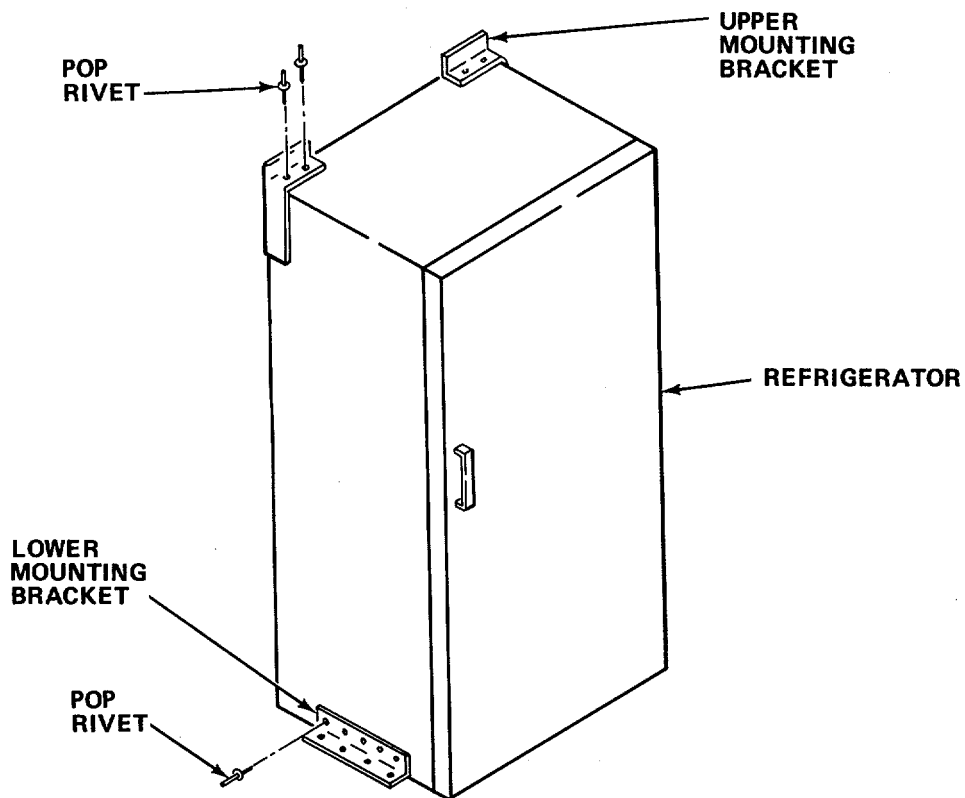
TOOLS:

Tool Kit, Light Machine Repair
 Electric Drill
 Drill Bits
 Pop Rivet Gun
 Carpenter's Level

SUPPLIES: Refrigerator
 Pop Rivets

PERSONNEL: Two persons are required to perform this procedure.

- a. Remove wall storage cabinet (paragraph 9-16.1).
- b. Unplug power cord.



- c. Drill out rivets from floor and wall mounting brackets.

WARNING

To prevent personnel injury, two persons are needed to move this equipment.

- d. Slide refrigerator from wall and remove.
- e. Clean exposed floor and wall area.

CAUTION

Maintain 3 in. clearance between refrigerator coils and wall, or damage to equipment could result.

- f. Slide new refrigerator into mounting brackets, maintaining 3 in. clearance between coils and wall.
- g. Ensure that van is level (paragraph 1-6.1).
- h. Using leveling feet and carpenter's level, level the refrigerator.

CAUTION

Use minimum penetration when drilling on refrigerator, or damage to equipment could result.

- i. Drill holes and rivet refrigerator to mounting brackets.
- j. Plug in refrigerator.
- k. Reinstall wall storage cabinet (paragraph 9-16.1).

10-16.4 Remove/Install Darkroom Safelight.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

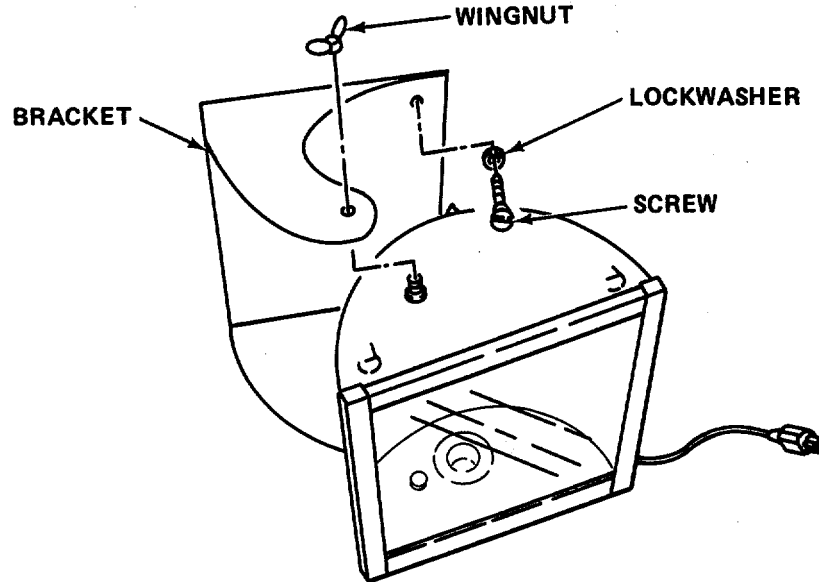
Tool Kit, Light Machine Repair
Cross Tip Screwdriver

SUPPLIES: Darkroom Safelight

WARNING

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

- a. Unplug power cord.



- b. Remove mounting wingnuts.
- c. Remove defective safelight from wall bracket.
- d. Remove screws and lockwashers from bracket.
- e. Remove bracket.
- f. Position new bracket and aline holes.
- g. Fasten bracket with lockwashers and screws.
- h. Attach new safelight to bracket with wingnuts.
- i. Plug in power cord.

10-16.5 Replace Refrigerator Light Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:

Tool Kit, Light Machine Repair
Cross Tip Screwdriver

SUPPLIES: Switch

WARNING

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

- a. Unplug power cord.
- b. Remove knob from temperature control.
- c. Remove screws from temperature control housing.

NOTE

Note location of temperature control capillary tube.

- d. Remove housing from control bracket.
- e. Tag and disconnect wires from defective switch, and remove defective switch.
- f. Install new switch, and reconnect wiring.
- g. Replace housing on control bracket.

CAUTION

Capillary tube is fragile and should be handled with care to avoid damage.

- h. Place capillary tube in position previously noted.
- i. Reinstall temperature control knob.
- j. Plug in power cord.

10-17. PREPARATION FOR STORAGE OR SHIPMENT . Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

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

APPENDIX A

REFERENCES

A-1. SCOPE.

This appendix lists all forms, field manuals, technical manuals and miscellaneous publications referenced in this manual.

A-2. FORMS.

Recommended Changes to Publications and Blank Forms DA Form 2028

Recommended Changes to Equipment Technical Publications DA Form 2028-2

Hand Receipt/Annex Number DA Form 2062

Equipment Inspection and Maintenance Worksheet DA Form 2404

The Army Maintenance Management System (TAMMS). DA Pam 738-750

Quality Deficiency Report..... SF 368

A-3. FIELD MANUALS.

Camouflage FM 5-20

First Aid for Soldiers..... FM 21-11

Nuclear, Biological and Chemical (NBC)
Defense (Reprinted w/Basic Incl C1) FM 21-40

Basic Cold Weather Manual FM 31-70

Northern Operations..... FM 31-71

Metal Body Repair and Related Operations..... FM 43-2

A-4. TECHNICAL MANUALS.

Administrative Storage of Equipment TM 740-90-1

Chemical, Biological and Radiological (CBR)
Decontamination..... TM 3-220

Operator's, Organizational, Direct Support and General
Support Maintenance Manual: Air Conditioner, Horizontal,
Compact, 208-Volt, 3-Phase, 18,000 Btu Cooling, 12,000
Btu Heating..... TM 5-4120-367-14

Operator's, Organizational, Direct Support and
 General Support Maintenance Manual for Chassis,
 Semi-Trailer, Container Transporter (ADCOR) TM 5-2330-305-14

Organizational, Direct Support and General Support
 Maintenance Repair Parts and Special Tools List
 (Including Depot Maintenance Repair Parts and
 Special Tools) for Air Conditioner/Heater TM 5-4120-367-24P

Organizational, Direct Support and General Support
 Maintenance Repair Parts and Special Tools List
 (Including Depot Maintenance Repair Parts and
 Special Tools) for Chassis, Semi-Trailer,
 Container Transporter (ADCOR) TM 5-2330-305-24P

Organizational, Direct Support and General Support
 Maintenance Repair Parts and Special Tools List
 (RPSTL) (Including Depot Maintenance Repair Parts
 and Special Tools) for Photomechanical Section TM 5-3610-285-24P

Hand Receipt Covering Contents of End Item (COEI), Basic
 Issue Items (BII) and Additional Authorization List (AML)
 for Photomechanical Section TM 5-3610-285-14-HR

Painting Instructions for Field Use TM 43-0139

Procedure for the Destruction of Equipment to
 Prevent Enemy Use..... TM 750-244-3

Use and Care of Hand Tools and Measuring Tools TM 9-243

A-5. MISCELLANEOUS PUBLICATIONS.

Lubrication Order: Topographic Support System Photomechanical
 Section, Model ADC-TSS-18..... LO 5-3610-285-12

Lubrication Order: Topographic Support System Chassis,
 Semi-Trailer, Container Transporter (ADCOR) LO 5-2330-305-12

Training Circular: Grounding Techniques TC11-6

APPENDIX B**MAINTENANCE ALLOCATION CHART****Section I INTRODUCTION****B-1. GENERAL.**

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

b. The Maintenance Allocation Chart (MAC) in section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance categories.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS . Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the 3d position code of the SMR code.

i. Repair. The application of maintenance services¹ including fault location/ troubleshooting., removal/installation, and disassembly/assembly³ procedures, and maintenance actions⁴ to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item or system.

j. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

a. Column 1, Group Number. Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies and modules with the next higher assembly. End item group number shall be "00."

b. Column 2, Component/Assembly. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph B-2.)

¹Services-Inspect, test, service, adjust, aline, calibrate and/or replace.

²Fault locate/troubleshoot-The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or unit under test (UUT).

³Disassemble/assemble-Encompasses the step-by-step taking apart (or breakdown) of a spare/functional group coded item to the level of its least componency identified as maintenance significant (i.e., assigned an SMR code) for the category of maintenance under consideration.

⁴Actions-Welding, grinding, riveting, straightening, facing, remachining and/or resurfacing.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the category of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance categories, appropriate work time figures will be shown for each category. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operation conditions. This time includes preparation time (including any necessary disassembly/ assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the Maintenance Allocation Chart. The symbol designations for the various maintenance categories are as follows:

- COperator or Crew
- OOrganizational Maintenance
- FDirect Support Maintenance
- HGeneral Support Maintenance
- LSpecialized Repair Activity⁵
- DDepot Maintenance

e. Column 5, Tools and Equipment. Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TMDE and support equipment required to perform the designated function.

f. Column 6, Remarks. This column shall, when applicable, contain a letter code, in alphabetical order, which shall be keyed to the remarks contained in Section IV.

⁵This maintenance category is not included in Section II, column (4) of the Maintenance Allocation Chart. To identify functions to this category of maintenance, enter a work time figure in the "H" column of Section II, column (4), and use an associated reference code in the Remarks column (6). Key the code to Section IV, Remarks, and explain the SRA complete repair application there. The explanatory remark(s) shall reference the specific Repair Parts and Special Tools List (RPSTL) TM which contains additional SRA criteria and the authorized spare/repair parts.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III

- a. Column 1, Reference Code. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.
- b. Column 2, Maintenance Category. The lowest category of maintenance authorized to use the tool or test equipment.
- c. Column 3, Nomenclature. Name or identification of the tool or test equipment.
- d. Column 4, National Stock Number. The National stock number of the tool or test equipment.
- e. Column 5, Tool Number. The manufacturer's part number.

B-5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.

- a. Column 1, Reference Code. The code recorded in Column 6, Section II.
- b. Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

Section II MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Eqpt	(6) Remarks
			C	O	F	H	D		
00	PHOTOMECHANICAL SECTION								
01	VAN BODY (ISO CONTAINER)	Inspect Service Repair	0.8 0.9	1.0	1.5	2.0		12,13,16 7,18,22	
	FLUORESCENT LIGHT ASSEMBLY	Repair	0.1	0.7				1,6	
	BLACKOUT/DOME LIGHT ASSEMBLY	Repair	0.2					6	
	EXHAUST FAN ASSEMBLY	Repair		0.5				6	
	AIR CONDITIONER/HEATER ASSEMBLY	Service Replace Repair	0.7			2.0		3,16 6	D
	ELECTRICAL ASSEMBLY	Repair		0.9	1.0			6,21	
	TELEPHONE BINDING POST ASSEMBLY	Repair		0.7				6	
	EMERGENCY LIGHT ASSEMBLY	Replace		0.3				6	
	TIEDOWN SOCKET ASSEMBLY	Replace		0.3				6	
	LEVEL INDICATOR ASSEMBLY	Repair		0.6				1,20	
	BLACKOUT CURTAIN ASSEMBLY	Repair		1.0				6	
	PERSONNEL LADDER ASSEMBLY	Repair		0.8				6,22	
	PERSONNEL/CARGO DOOR ASSEMBLY	Replace Repair			1.5 2.0			3 3	

Section II MAINTENANCE ALLOCATION CHART - Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Eqpt	(6) Remarks
			C	O	F	H	D		
02	FLIP-TOP PLATEMAKER	Inspect	0.1	0.1					
		Test	0.3	0.2	1.0			6,11	
		Service Remove/ Install	0.1	1.0				13,20 6	
	VACUUM FRAME AND CENTER SECTION ASSEMBLY	Service	0.1					12	
		Adjust Replace	0.4	0.7				6	
	VACUUM FRAME	Replace		0.7				6	
	LATCH HOUSING ASSEMBLY	Replace		0.2				6	
	CONTROL PANEL ASSEMBLY	Replace		0.3				6	
	CIRCUIT BOARDS	Test				0.2		6,11	
		Replace				0.7		6	C
	LOWER CABINET ASSEMBLY	Service	0.2	0.5				6,13,12	
		Repair		2.0				6,11	
		Replace		3.2				6	
3KW POWER SUPPLY	Replace		0.4	0.6			6		
RELAY PANEL ASSEMBLY	Replace		0.5				6		
LAMP DRAWER ASSEMBLY	Service Replace	0.1	0.2				12 6		
RACK ASSEMBLY	Repair		0.1				6		
SPARE GLASS HOLDER	Inspect	0.1							
	Replace		0.3				6		
03	PLATE FINISHING TABLE	Inspect	0.2	0.1				6	
		Test	0.1	0.2				6,11	
		Service Remove/ Install	0.1	0.3				6	
		Install		1.0				6	
		Repair	0.2	1.0				6	

Section II MAINTENANCE ALLOCATION CHART- Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Eqpt	(6) Remarks
			C	O	F	H	D		
04	SINK	Inspect Remove/ Install Repair	0.1	0.4 0.6				6,22 6	
	WATER TANK	Inspect Remove/ Install	0.1	0.5				6,22	
05	FILM PROCESSOR	Remove/ Install		1.3				6	
	DEVELOPER FILTER	Replace	0.1					13	
	STRAINERS	Service	0.1					13	
	AIR FILTERS	Service	0.1						
	PROCESSING TANKS	Service	0.2					13	
	FEED TRAY	Adjust	0.1					13	
	RECIRCULATION FILTER	Replace	0.1					13,16	
	DRIVE GEARS	Inspect Service Replace	0.1 0.1		0.3			12	
	FLOWMETER	Service Repair	0.1	0.2				6	
	DRIVE CHAINS	Inspect Service Replace	0.1 0.1		0.3			12	
	TRANSPORT SYSTEM								
	DRYER ROLLERS	Inspect Service Replace	0.1 0.1	0.2					
	SQUEEGEE CROSSOVER	Inspect Replace Repair	0.1 0.1		0.4			6,17	

Section II MAINTENANCE ALLOCATION CHART- Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Eqpt	(6) Remarks
			C	O	F	H	D		
	ENTRANCE CROSSOVER	Inspect Replace Repair	0.1 0.1		0.4			6	
	DEVELOPER RACK	Inspect Replace Repair	0.1 0.1		1.2			6,17	
	FIXER RACK	Inspect Replace Repair	0.1 0.1		0.3			6,17	
	WASH RACK	Inspect Replace Repair	0.1 0.1		0.3			6,17	
	PROCESSING FLUID SYSTEM								
	RECIRCULATION PUMPS	Inspect Replace Repair	0.1	0.3	0.5			6 6	
	REPLENISHER PUMP UNIT	Inspect Replace Repair	0.1	0.3	0.4			6 6	
	CHILLER	Inspect Replace	0.1	0.2				6	
	DRYING SYSTEM BLOWER	Inspect Replace	0.1		0.5			6	
	HEATER	Inspect Replace	0.1	0.3				6	
	AIR TUBES	Inspect Replace	0.1	0.2					
	ELECTRICAL SYSTEM STANDBY CONTROL CIRCUIT BOARD 500	Test Replace		0.2 0.1				2 2	C

Section II MAINTENANCE ALLOCATION CHART- Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Eqpt	(6) Remarks
			C	O	F	H	D		
	POWER SUPPLY CIRCUIT BOARD 600	Test Replace		0.2 0.1				2 2	C
	DEVELOPER TEM- PERATURE CIRCUIT BOARD 700	Test Replace		0.2 0.1				2 2	C
	DRYER TEMPERA- TURE CIRCUIT BOARD 800	Test Replace		0.2 0.1				2 2	C
	MOTOR CONTROL CIRCUIT BOARD 900	Test Replace		0.2 0.1				2 2	C
	WATER CONTROL CIRCUIT BOARD 1000	Test Replace		0.2 0.1				2 2	C
	DEVELOPER HEATER	Replace		0.2				6	
	PLUMBING SYSTEM								
	RECIRCULATION TANK	Service Replace	0.3		1.3			6,22	
	HEATER	Replace		0.3				6	
	THERMOSTAT	Replace		0.2				6	
	SUMP PUMP	Inspect Replace Repair	0.1	0.3	0.3			6 6	
	SUMP PUMP POWER SUPPLY	Test Replace		0.2 0.1				2 2	
	RECIRCULATION PUMP	Inspect Replace Repair	0.1	0.3	0.3			6 6	
	RECIRCULATION FILTER	Service, Replace	0.1 0.1						

Section II MAINTENANCE ALLOCATION CHART- Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Eqpt	(6) Remarks
			C	O	F	H	D		
06	CONTACT VACUUM FRAME	Inspect	0.2	0.1					
		Test	0.1	0.6					
		Service	0.1	0.3				6	
		Remove/Install		0.6				6	
	VACUUM FILTERS	Service Replace	0.1 0.1						
	VACUUM BLANKET	Service Replace	0.1	0.2				6	
	VACUUM BLEED VALVE	Replace		0.3				6	
VACUUM GAGE	Replace		0.2				6		
VACUUM PUMP	Replace		0.2				6		
07	DIGITAL DENSITOMETER	Inspect	0.1						
		Remove/Install		0.3				6	
	REFLECTION PROBE	Inspect	0.2						
		Service	0.1						
		Replace/Repair	0.2	0.2				6 4,6	
	TRANSMISSION PROBE	Inspect	0.1						
		Service	0.1						
		Replace/Repair	0.1	0.2				6 4,6	
	DENSITOMETER	Inspect/Service	0.1 0.1						
TRANSFORMER	Replace		0.2				4		
FILTERS	Replace		0.1				6		
ZERO CONTROL	Replace		0.2				4		
SLOPE CONTROL	Replace		0.2				4		

Section II MAINTENANCE ALLOCATION CHART- Cont

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Eqpt	(6) Remarks
			C	O	F	H	D		
08	CHANNEL CONTROL	Replace		0.2				4	
	CLOCK BOARD ASSEMBLY	Test			0.2			4	
		Replace			0.1			4	C
	LOGIC BOARD ASSEMBLY	Test			0.2			4	
		Replace			0.1			4	C
	POWER SUPPLY ASSEMBLY	Test			0.2			4	
		Replace			0.1			4	C
	PHOTOMULTIPLIER BOARD ASSEMBLY	Test			0.2			4	
		Replace			0.1			4	C
	09	PORTABLE TRACING/ SCRIBING BOARD	Inspect	0.2					
Service			0.2					13	
Repair			0.3	0.5				6,13	
10	FURNITURE AND CABINETS	Inspect	0.1						
		Repair		0.3				6	
		Remove/ Install		0.4				6,22	
10	SUPPORT ITEMS	Inspect	0.1						
		Service	0.1					20	
		Remove/ Install							
		Repair	0.1					6,22	

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) Ref Code	(2) Maint Cat	(3) Nomenclature	(4) National/NATO Stock Number	(5) Tool Number
1	O	Tool Kit, Precision Instrument Repair	5180-00-596-1538	W49307
2	O	Tool Kit, Electronic Equipment	5180-00-654-5178	TK101/6
3	F	Tool Kit, General Mechanic's Automotive	5180-00-177-7033	W33004
4	O,F	Tool Kit, Electronic Equipment	5180-00-605-0079	TK-100/6
5	O,F	Tool Kit, Electronic Equipment	5180-00-610-8177	TK-105/6
6	O,F	Tool Kit, Light Machine Repair	5180-00-596-1540	W43827
7	O,F	Tool Kit, Service, Refrigeration Unit	5180-00-596-1474	W51362
8	C	Brush, Lens	7920-00-205-0565	
9	C	Cylinder, Graduated (05668) 6138-80	6640-00-427-5250	
10	C	Handle, Socket Wrench (75204) TR5	5120-00-240-5396	
11	C	Pliers, Slip Joint	5120-00-223-7396	
12	C	Screwdriver, Flat Tip	5120-00-234-8910	
13	C	Screwdriver, Cross Tip	5120-00-764-8080	
14	C	Screwdriver, Cross Tip	5120-00-764-8102	
15	C	Socket Head Key Set (70264) 644		
16	C	Wrench, Adjustable 8 in.	5120-00-240-5328	
17	C	Wrench Set, Socket	5120-00-081-2305	
18	O,F	Brush, Paint	8020-00-297-6658	
19	O	Brush, Tube Cleaning	7920-00-282-7783	
20	O	Level, Carpenter's	5210-00-239-0892	

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) Ref Code	(2) Maint. Cat	(3) Nomenclature	(4) National/NATO Stock Number	(5) Tool Number
21	O,F	Multimeter	6625-01-128-8015	
22	O,F	Rivet Gun	5120-00-017-2849	
23	0	Spring Scale	6670-00-238-9777	
24	0	Thermometer, Bimetallic	6685-00-174-6239	

Section IV. REMARKS

REFERENCE CODE	REMARKS
A	Printed circuit boards will be repaired at the General Support Maintenance level to the maximum extent possible as required by AR750-1.
B	Direct Support Maintenance will provide printed circuit board diagnosis and fault isolation which can be readily accomplished with assigned tools and test, measurement, and diagnostic equipment (TMDE).
C	Replace of printed circuit boards authorized by the MAC are those identified as damaged or otherwise defective which - a) Can be readily removed/installed with easy to use tools. b) Do not require critical adjustment, calibration, or alignment before or after installation.
D	See TM 5-4120-367-14 for maintenance procedures.

APPENDIX C**COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS**

Section I INTRODUCTION**C-1. SCOPE.**

This appendix lists components of end item and basic issue items for the Photomechanical Section to help you inventory items required for safe and efficient operation.

C-2. GENERAL.

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

a. Section II: Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b. Section III: Basic Issue Items. These are the minimum essential items required to place the Photomechanical Section in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the Photomechanical Section during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS.

The following provides an explanation of columns found in the tabular listings:

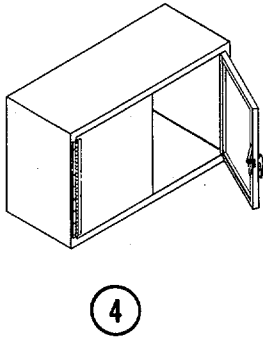
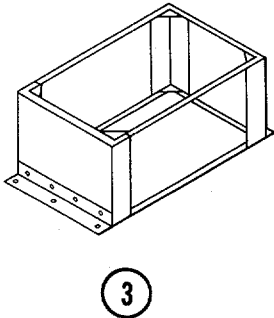
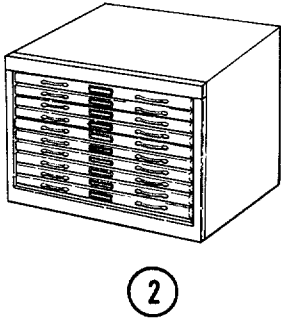
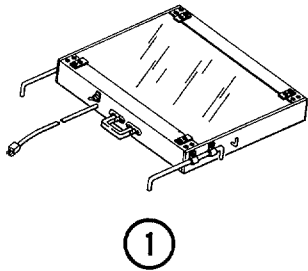
a. Column (1): Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

b. Column (2): National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

c. Column (3): Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

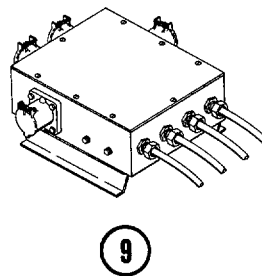
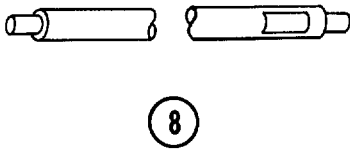
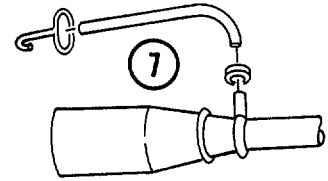
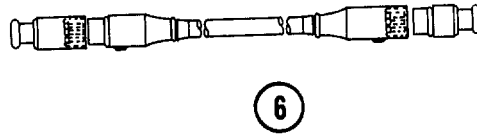
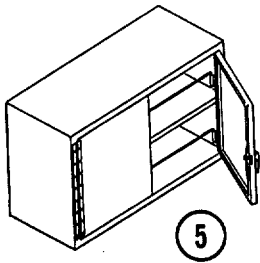
d. Column (4): Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two character alphabetical abbreviation (e.g. , ea, in, pr).

Section II. COMPONENTS OF END ITEM



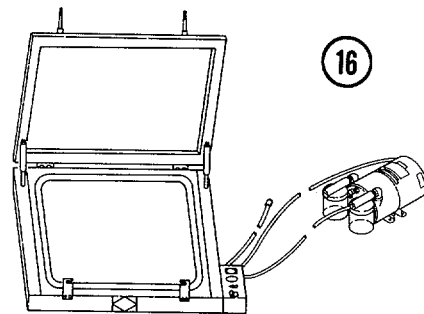
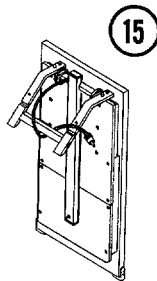
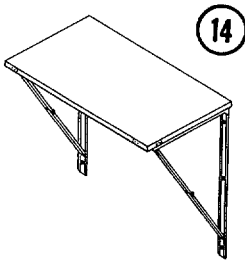
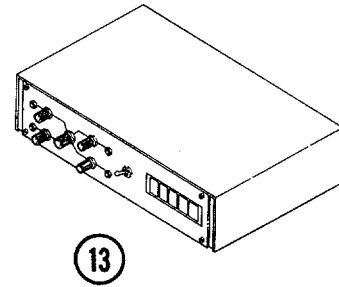
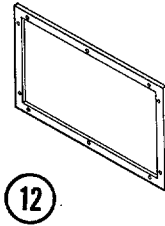
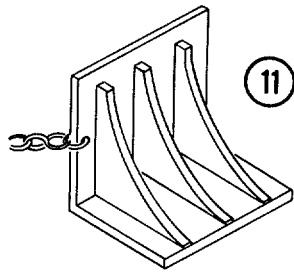
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
1	6675-00-221-7121	BOARD, PORTABLE TRACING/SCRIBING: (26954) 51J3	ea	1
2		CABINET, PHOTOLITHOGRAPHIC SUPPLY STORAGE, 10-DRAWER: (97403) 13225E5160	ea	1
3	7125-01-219-6799	CABINET, PHOTOLITHOGRAPHIC SUPPLY STORAGE, 10-DRAWER, BASE (97403) 13225E5156	ea	1
4		CABINET, TECH MANUAL STORAGE: (97403) 13225E4648	ea	1

Section II. COMPONENTS OF END ITEM - Cont



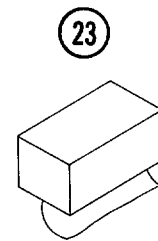
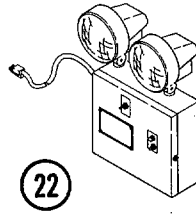
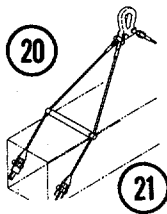
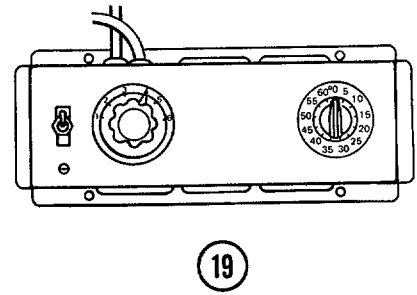
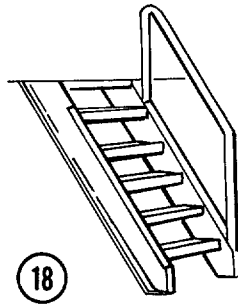
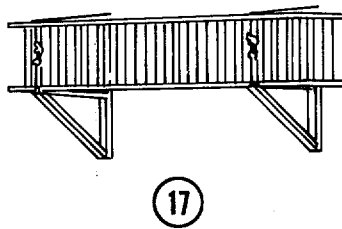
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
5	7125-00-286-5259	CABINET, WALL STORAGE: (97403) 13225E3150	ea	2
6	6150-00-134-0847	CABLE ASSEMBLY, POWER, ELECTRICAL: (91029) RC-1736-5	ea	1
7	6150-01-221-6032	CABLE ASSEMBLY, POWER, MODIFIED: (97403) 13225E4619	ea	1
8		CABLE, GROUND: (97403) 13225E3274	ft	6
9	6150-01-081-9264	CABLE TERMINAL BOX ASSEMBLY: (97403) 13225E6250	ea	1
10	7110-00-281-4472	CHAIR, ROTARY: (59177) D42L	ea	1

Section II. COMPONENTS OF END ITEM - Cont



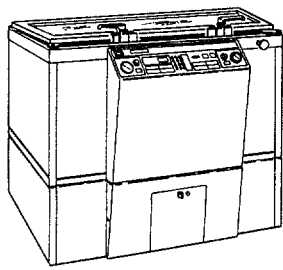
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
11	2530-01-216-2575	CHOCK, WHEEL TRACK: (97403) 13225E4710	se	2
12		CORKBOARD: (51745) ADC-2111	ea	1
13		DENSITOMETER, DIGITAL: (51490) RD/TD-144	ea	1
14		FOLDING WORK SURFACE (97403) 13225E5180-103	ea	1
15		FOLDING TABLE, WORK SURFACE, TRANSMISSION PROBE (97403) 13225E5180-102	ea	1
16		FRAME, CONTACT VACUUM: (97391) VFC32P	ea	1

Section II. COMPONENTS OF END ITEM - Cont

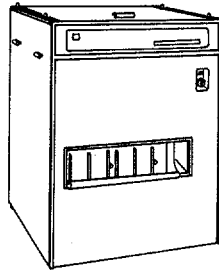


(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
17	5440-01-152-7751	LADDER, EXTENSION, FOLDING: (39428) 8028T16	ea	1
18	2540-01-133-9726	LADDER, VEHICLE, BOARDING: (97403) 13225E3074	ea	2
19	6740-00-944-1824	LAMP CONTROL BOX, TIMER/POWER SUPPLY (93791) CP25	ea	1
20	3990-01-234-6562	LIFTING AND TIEDOWN DEVICE, TRANSPORTABLE SHELTER, LEFT-HAND: (52555) 1390-4	ea	2
21	3990-01-234-6561	LIFTING AND TIEDOWN DEVICE, TRANSPORTABLE SHELTER, RIGHT-HAND: (52555) 1390-3	ea	2
22	6230-01-221-6036	LIGHT, EMERGENCY: (97403) 13225E3497	ea	1
23	4510-00-224-8549	PAPER TOWEL DISPENSER:	ea	2

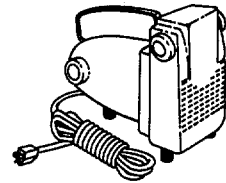
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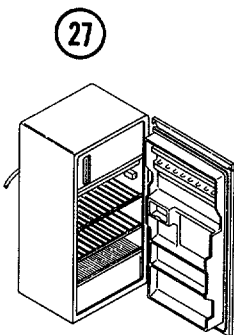
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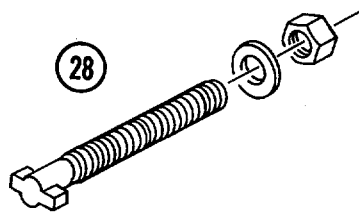
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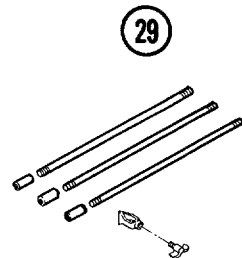
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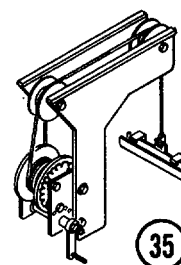
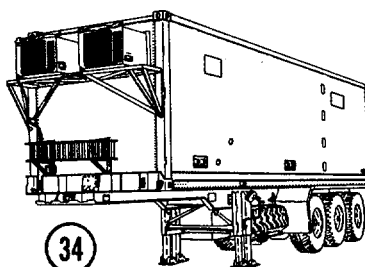
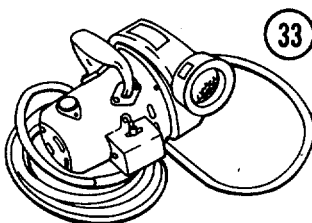
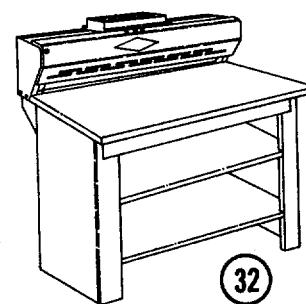
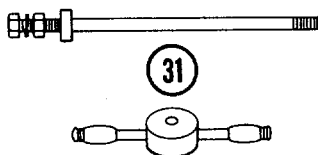
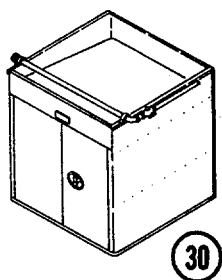
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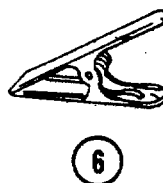
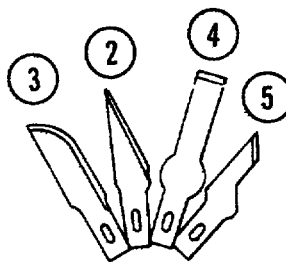
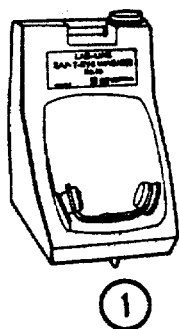
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
24		PLATEMAKER, FLIP-TOP: (97403) 13225E4729	ea	1
25	6740-00-355-7554	PROCESSOR, FILM: (97403) 13225E5126	ea	1
26	4320-01-098-0156	PUMP UNIT, CENTRIFUGAL: (39428) 9962K11	ea	1
27	4110-00-266-9291	REFRIGERATOR, MECHANICAL, HOUSEHOLD: (97403) 13225E4756	ea	1
28	2530-01-095-3561	RELEASE STUDY ASSEMBLY (50153) 11MO11	ea	6
29	5975-00-878-3791	ROD, GROUND (81348) W-R-550TYIIICLB	ea	1

Section II. COMPONENTS OF END ITEM - Cont



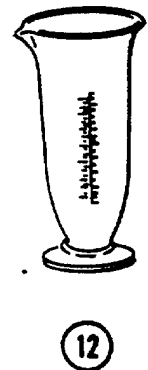
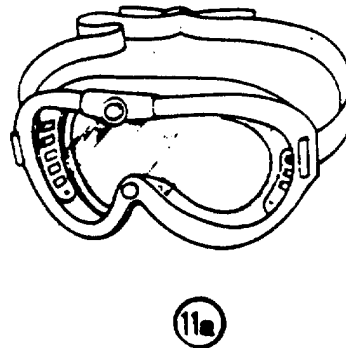
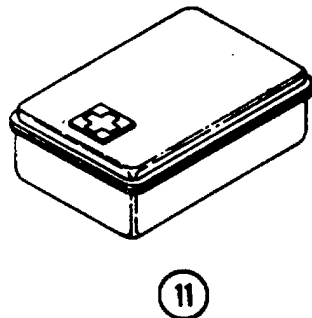
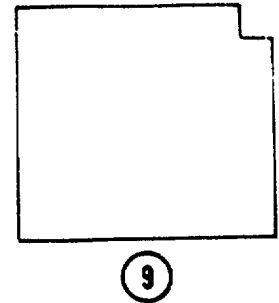
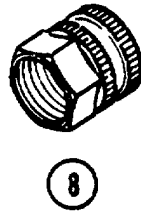
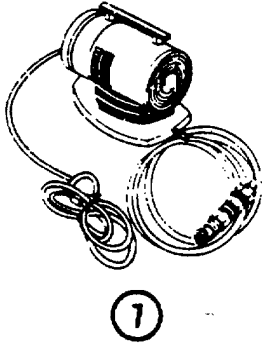
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30	3610-00-294-6699	SINK, PROCESSING, LITHOGRAPHIC (97403) 13225E4748	ea	1
31	5120-01-013-1676	SLIDE HAMMER, GROUND ROD EMPLACEMENT (45225) P74-144	ea	1
32	3610-01-033-7963	TABLE, PLATE FINISHING (97403) 13225E4725	ea	1
33	7910-00-205-3400	VACUUM CLEANER, ELECTRIC (51745) MVV3400	ea	1
34	3610-01-022-6635	VAN, PHOTOMECHANICAL SECTION, TOPOGRAPHIC SUPPORT SYSTEM, SEMI- TRAILER MOUNTED (51745) ADC-TSS-18	se	1
35		WINCH, AUTO BRAKING (97403) 13225E5150	ea	1

Section III BASIC ISSUE ITEMS



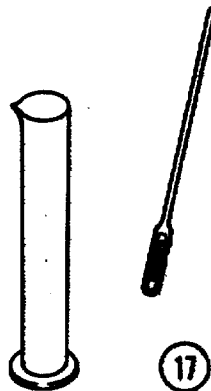
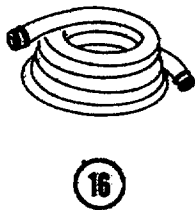
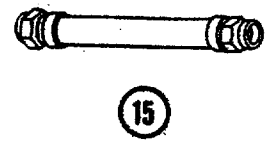
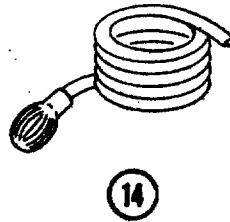
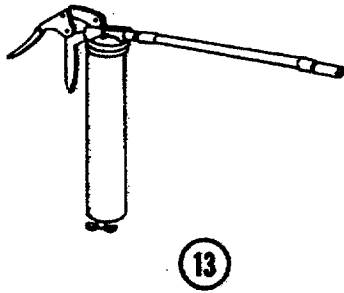
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
1	4240-01-298-9317	EYE WASH STATION (95632)98	ea	1
2	5110-00-359-6478	BLADE, BEVLED (99941)11	pg	4
3	5110-00-542-2043	BADE, CURVED (99941)10	pg	4
4	5110-00-542-2044	BLADE, SUARE (99941)17	pg	4
5	5110-00-764.418	BLADE, STENCIL (99941)16	pg	4
6	5120-00-962-7659	CLAMP, HAND SPRING (12432)20102	ea	6

Section III. BASIC ISSUE ITEMS -Cont.



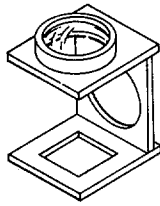
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7		COMPRESSOR, AIR (07334) 34-2025	ea	1
8	4730-00-517-6831	COUPLING, HOSE, 3/4 INCH (77860)351425	ea	1
9		DRAINBOARD (97403) 13225E5140	ea	1
10	4120-00-555-8837	EXTINGUISHER, FIRE (06535)FH-900-2	ea	2
11	6545-00-922-1200	FIRST AID KIT (81348)A-A-92	ea	1
11A	4240-00-052-3776	GOGGLES, INDUSTRIAL (81348) A-A-1110	pr	4 pr
12	6640-00-427-5250	GRADUATE, LIQUID, LABORATORY (05668) 6138-80	ea	1

Section III. BASIC ISSUE ITEMS - Cont

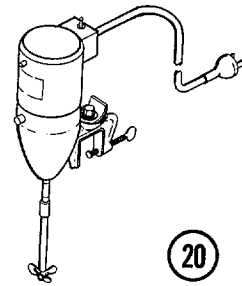


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13	4930-00-965-0288	GREASE GUN (77335) 30-171	ea	1
14	4720-00-092-9608	HOSE ASSEMBLY, 1 1/2 IN. X 15 FEET LONG	ea	1
15	4720-00-202-8659	HOSE ASSEMBLY, NONMETALLIC	ea	1
16	4720-00-202-6722	HOSE ASSEMBLY, NONMETALLIC	ea	3
17		HYDROMETER, GRADUATED SCALE (94480) 11-540A AND 08-53OJCYL	ea	1
18	5110-00-595-8400	KNIFE, CRAFTSMAN'S (99941) 3001	ea	2

Section III. BASIC ISSUE ITEMS - Cont



19



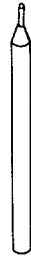
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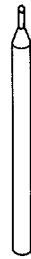
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19	6650-00-255-8268	MAGNIFIER (94480) 12-064-10	ea	2
20	4940-00-360-2728	MIXER, LIQUID, REVOLVING SHAFT (91313) M-25	ea	1
21	5120-00-293-1132	NEEDLE, ETCHING, FLAT (81349) MILN43186STYIVSZ1	ea	2
22	5120-00-293-0589	NEEDLE, ETCHING, OVAL (81349) MILN43186STYIIISZ1	ea	2
23	5120-00-293-0591	NEEDLE, ETCHING, ROUND (81349) MILN43186STYISZ1	ea	2
24	5120-00-293-0593	NEEDLE, ETCHING, ROUND (81349) MILN43186STYISZ2	ea	2

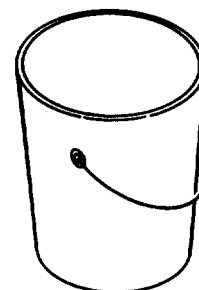
Section III. BASIC ISSUE ITEMS - Cont



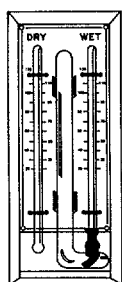
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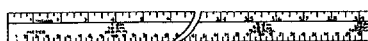
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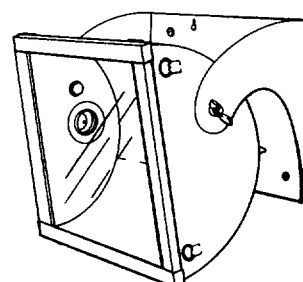
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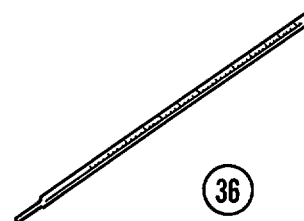
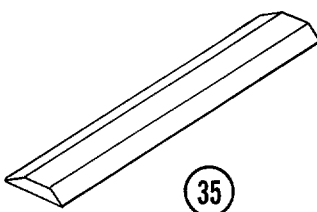
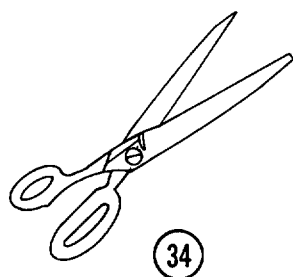
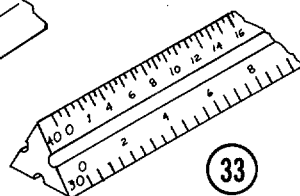
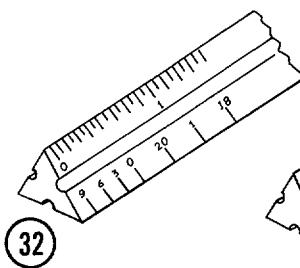
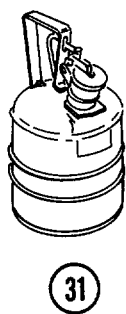
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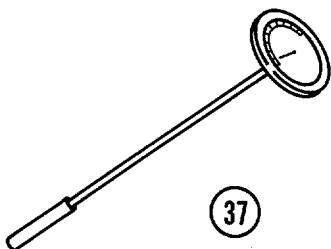
(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
25	5120-00-278-0813	NEEDLE, ETCHING, SQUARE (81349) MILN43186STYIISZ4	ea	2
26	5340-00-682-1505	PADLOCK SET (96906) MS21313-52	se	1
27		PAIL, STAINLESS STEEL, 22 LITER (94480) 03-687C	ea	1
28	6685-00-641-3580	PSYCHROMETER (64467) 314	ea	1
29	5120-00-273-1960	RULE, STEEL (57163) C607R-36	ea	1
30	6740-00-200-8176	SAFELIGHT, DARKROOM, PHOTOGRAPHIC (19139) 141 2261	ea	2

Section III. BASIC ISSUE ITEMS - Cont

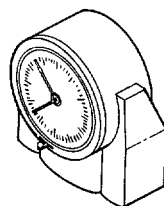


(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
31	7240-00-244-7412	SAFETY CAN, FIXED SPOUT (20005) 10101	ea	1
32	6675-00-234-5009	SCALE, DRAFTING (23366) 240/18	ea	1
33	6675-00-234-5109	SCALE, DRAFTING (23366) 241/24	ea	1
34	5110-00-162-2207	SHEARS, STRAIGHT, TRIMMER'S (96508) 22	ea	2
35	STRAIGHTEDGE	(09058) 599-526-60	ea	1
36	6685-00-526-8261	THERMOMETER, SELF-INDICATING (81349) MIL-T-1180	ea	1

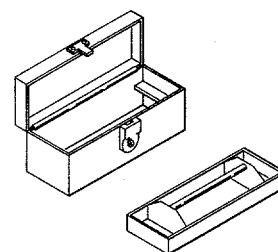
Section III. BASIC ISSUE ITEMS - Cont



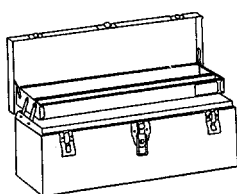
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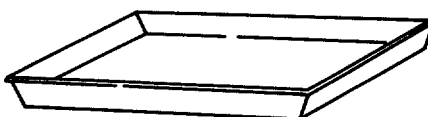
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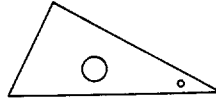
42

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
37	6685-00-174-6239	THERMOMETER, SELF-INDICATING, BIMETALLIC (98773) G207	ea	2
38	6645-00-243-9470	TIMER, STOP (19139) 1523612	ea	1
39	5140-00-315-2747	TOOL BOX (75803) 2747	ea	1
40	5140-00-331-5496	TOOL BOX (75206) CS-19	ea	1
41	6740-00-224-9679	TRAY, PROCESSING, PHOTOGRAPHIC (08215) 2630-3	ea	3
42	6675-00-190-5860	TRIANGLE, DRAFTING, 12 INCHES (88997) A-346	ea	1

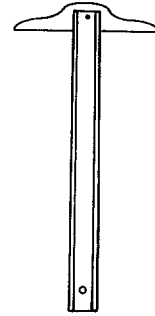
Section III. BASIC ISSUE ITEMS - Cont



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(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqr
43	6675-00-190-5865	TRIANGLE, DRAFTING, 16 INCHES (88997) A-345	ea	1
44	6675-00-254-4862	TRIANGLE, DRAFTING (81562) 140511	ea	1
45	6675-00-183-6487	T-SQUARE (81562) 140791	ea	1

APPENDIX D

ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

D-1. SCOPE. This appendix lists additional items you are authorized for the support of the Photomechanical Section.

D-2. GENERAL. This list identifies items that do not have to accompany the Photomechanical Section and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA or JTA.

D-3. EXPLANATION OF LISTINGS . National stock numbers, descriptions and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e. , CTA, MTOE, TDA or JTA) which authorizes the item(s) to you.

Section II. ADDITIONAL AUTHORIZATION LIST

(1) National Stock Number	(2) Description FSCM and Part Number	(3) U/M	(4) Qty Auth
<u>TOE AUTHORIZED ITEMS</u>			
4120-01-075-1753	Air Conditioner, 18,000 Btu	ea	2
6115-00-283-9051	Generator Set, DSL Eng TM:60 kW	ea	1
4320-00-554-7321	Pump Centrif: Shlw Well	ea	2
5805-00-543-0012	Telephone Set: TA-312/PT	ea	1
2330-00-832-8801	Trailer Tank: Water 400 gal	ea	1

D-1/(D-2 blank)

APPENDIX E

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. SCOPE. This appendix lists expendable supplies and materials you will need to operate and maintain the Photomechanical Section. This listing is for information purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except Medical, Class V, Repair Parts and-Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

E-2. EXPLANATION OF COLUMNS.

a. Column (1) Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e. g. , "Use cleaning compound, Item 5, Appendix E").

b. Column (2) Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew
O - Organizational Maintenance
F - Direct Support Maintenance
H - General Support Maintenance

c. Column (3) National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column (4) Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

e. Column (5) Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by two character alphabetical abbreviations (e. g. , ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	O	8040-00-174-2610	Adhesive, Rubber	cn
2	F	8040-00-152-0063	Adhesive, Waterproof	cn
3	C		Adhesive, Spray (21436) 83-5-104571	cn
4	C	8125-01-088-3553	Bottle, Adhesive Dispenser (87319) 5006	ea
5	C	8020-00-598-5907	Brush, Artist's (75364) 9355, Size 6	ea
6	C	8020-00-262-9099	Brush, Artist's (75364) 9382, Size 8	ea
7	C	8020-00-264-3883	Brush, Artist's (75364) 9382, Size 12	ea
8	C	8020-00-224-8027	Brush, Artist's (75364) 9355, Size 8	ea
9	C	8020-00-224-8022	Brush, Artist's (75364) 9382, Size 6	ea
10	C	7920-00-291-0812	Brush, Dusting, Draftsman's (79819) 06-38ND-D1O	ea
11	C	7930-00-144-7061	Cleaner, Glass	cn
12	C		Cleaner, System, Developer (19139) 101-3259	pg
13	C	6750-00-037-9099	Cleaner, System, Fixer	bt
14	C	8305-00-222-2423	Cloth, Cheesecloth	yd
15	C	8220-00-299-8625	Cotton, Nonsterile	pk
16	C	7930-00-530-8067	Detergent, General Purpose	gl
17	C	7520-00-285-1772	Dispenser, Tape (76381) C-22	ea
18	C	7510-00-223-7044	Eraser, Rubber	ea

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST-Cont

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
19	C	6740-00-577-5837	Filter, Photographic Darkroom Safelight	ea.
20	F	5610-00-618-0258	Floorpatch	gl
21	C	7240-00-243-3614	Funnel, Plastic	ea
22	C	8415-00-248-3228	Gloves, Plastic, Disposable (80011) 11-394-11OB	bx
23	0		Grease, Ball and Roller Bearing (19139) 760614	lb
24	0	9150-00-190-0904	Grease, General Purpose	lb
25	C		Gum Solution (54624) 325	gl
26	C	8520-00-965-2109	Hand Cleaner (06608) 224200	pt
27	C		Lab Apron (94480) A4365	bx
28	C	6240-01-050-4441	Lamp, Mercury Vapor KM5	ea
29	C	7510-00-295-6170	Lead Repointer, Pencil (75364) 234	ea
30	C	7510-00-285-5866	Lead, Pencil, Graphite (79819) 2200-H	pg
31	F	9510-00-273-2389	Oil, Lubricating, General Purpose	cn
32	C	9510-00-189-6727	Oil, Lubricating SAE 10	qt
33	C	9150-00-052-9498	Oil, Lubricating SAE 20 (19139) TL2199	qt
34	C	6750-00-264-6763	Opaque, Paste, Retouch (19136) 146-4312	jr
35	C	7240-00-060-6006	Pail, Utility, Plastic (05668) 6270-10	ea

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST-Cont

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
36	0	8010-00-111-7937	Paint, Forest Green, Ext	gl
37	0	8010-00-298-3859	Paint, Light Green, Int	gl
38	C	7530-00-417-6719	Paper, Blotting	pg
39	C		Paper, Copy (19139) 594898	ea
40	C	3610-00-183-7085	Paper, Masking, Photolithographic	pg
41	C		Pen, Felt-Tip, Opaque, Red (79819) 8909	bx
42	C		Pen, Felt-Tip, Opaque, Red (79819) 8910	bx
43	C	7510-00-240-1525	Pencil, Glazed Surface, White	ea
44	C	7510-01-083-6734	Pencil, Mechanical (78919) 5611	ea
45	C	9330-00-282-8319	Plastic Sheet	rl
46	C	9330-00-202-4496	Plastic Sheet, Vinyl Chloride	bx
47	0	7920-00-205-1711	Rags	be
48	C	6750-00-264-6764	Red Rouge Paste, Retouch	jr
49	F	8010-01-030-7254	Resin, Epoxy	kt
50	0	5335-01-211-3292	Screen, Nylon (39428) 1017A11	ro
51	0	8040-00-851-0211	Sealant, Silicone	tu
52	0	3439-00-555-4629	Solder, Rosin Core	ea
53	0	6850-00-274-5421	Solvent, P-D-680	cn
54	0		Solvent, Flushing, Nonflammable (24123) AH255	cn
55	C	7920-00-240-2555	Sponge, Cellulose	ea

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST-Cont

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
56	0	6850-00-274-5421	Spray, Silicone	cn
57	0		Sprayfoam Sealant (39428) 7627T1	cn
58	0	5640-00-103-2254	Tape, Cloth, Duct Sealing	ro
59	C	5970-00-419-4290	Tape, Insulation, Electrical	ro
60	C	7510-00-051-1171	Tape, Pressure Sensitive Adhesive, Red, 1 in. Wide	ro
61	C	7510-00-285-6403	Tape, Pressure Sensitive Adhesive, Red, 1/2 in. Wide	ro
62	C	7510-00-551-9823	Tape, Pressure Sensitive Adhesive, Transparent, 1 in. Wide	ro
63	C	7920-00-823-9772	Towel, Paper (95135) DW61-1000-22	bx
64	0	8300-00-999-6313	Thread Sealer	tu
65	0	4020-00-233-5984	Twine, Cotton	lb
66	C	8030-00-875-9747	Teflon Tape	rl
67	0	9150-00-985-7243	Thermal Grease	tu

Change 1 E-5/(E-6 blank)

GLOSSARY

ABBREVIATION/TERM	DEFINITION
Angstrom Unit(\AA)	A unit of length equal to one ten-billionth of a meter. Used to measure the wavelengths of light.
Cathode	The negative electrode of a tube or diode.
Densitometer	An electric instrument for measuring optical density or tone. Transmission densitometers measure the full density range of negatives. Reflection densitometers measure the reflection range of opaque copy.
Density	(1) The mass per unit volume of a substance under specified conditions of pressure and temperature. (2) The quantity of metallic silver per unit area in negatives and positives.
Dynode	An electrode having the primary function of supplying secondary-electron emission, for current amplification, in an electron tube.
Fiber Optics	That branch of optical technology concerned with the transmission of radiant power through fibers made of transparent materials such as glass, fused silica, or plastic.
Flat	(1) Lithography: The assembly of negatives on goldenrod paper for contact exposure with a sensitized plate. (2) Photography: Lacking in contrast.
Halation	Blurring of a photographic image because of light reflection from the film base.
Peel	Selectively removing the opaque layer from its film base.
Peel Coat	A film which produces a peelable negative directly from a scribed original or film negative. The peel coat film eliminates the possibility of misregistration which occurs due to size variations inherent in photo materials after processing.
Photomultiplier Tube	A phototube with one or more dynodes between its photocathode and the output electrode.

GLOSSARY - Cont

ABBREVIATION/TERM	DEFINITION
Plenum	An enclosed space in which air pressure is greater than that of the outside atmosphere.
Sensitivity Guide	Measures tone variations of an exposed plate; a gray scale exposed on a plate with an image which, when developed, shows the sensitivity of the coating.
Stripping	(1) The art of producing a flat. (2) The refusal of ink rollers to accept ink, caused by glazing or driers.

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By Order of the Secretary of the Army:

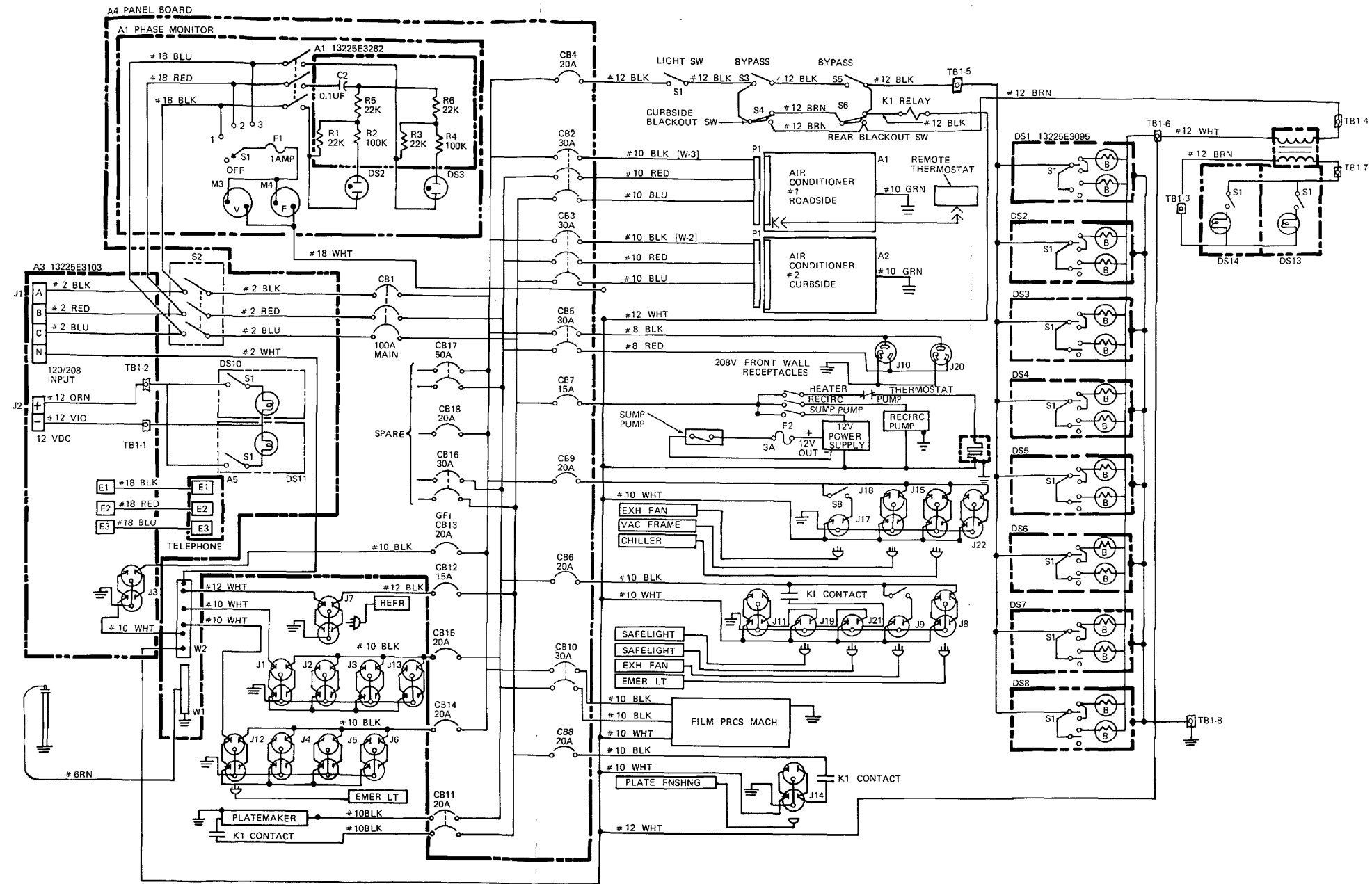
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To be distributed in accordance with DA Form 12-25A, Operator's, Organizational, Direct Support and General Support Maintenance requirements for Plate Process Section, Topographic Court System, Semitrailer Mounted (10536-2).



- NOTES:
1. ALL GROUNDS DEPICTED (⏏) TO TIE BACK TO W1.
 2. USE #12 GREEN GROUNDING WIRE FOR BRANCH CIRCUITS UNLESS OTHERWISE SPECIFIED.

Figure FO1 Photomechanical Diagram Schematic
FP-1/(FP-2 blank)

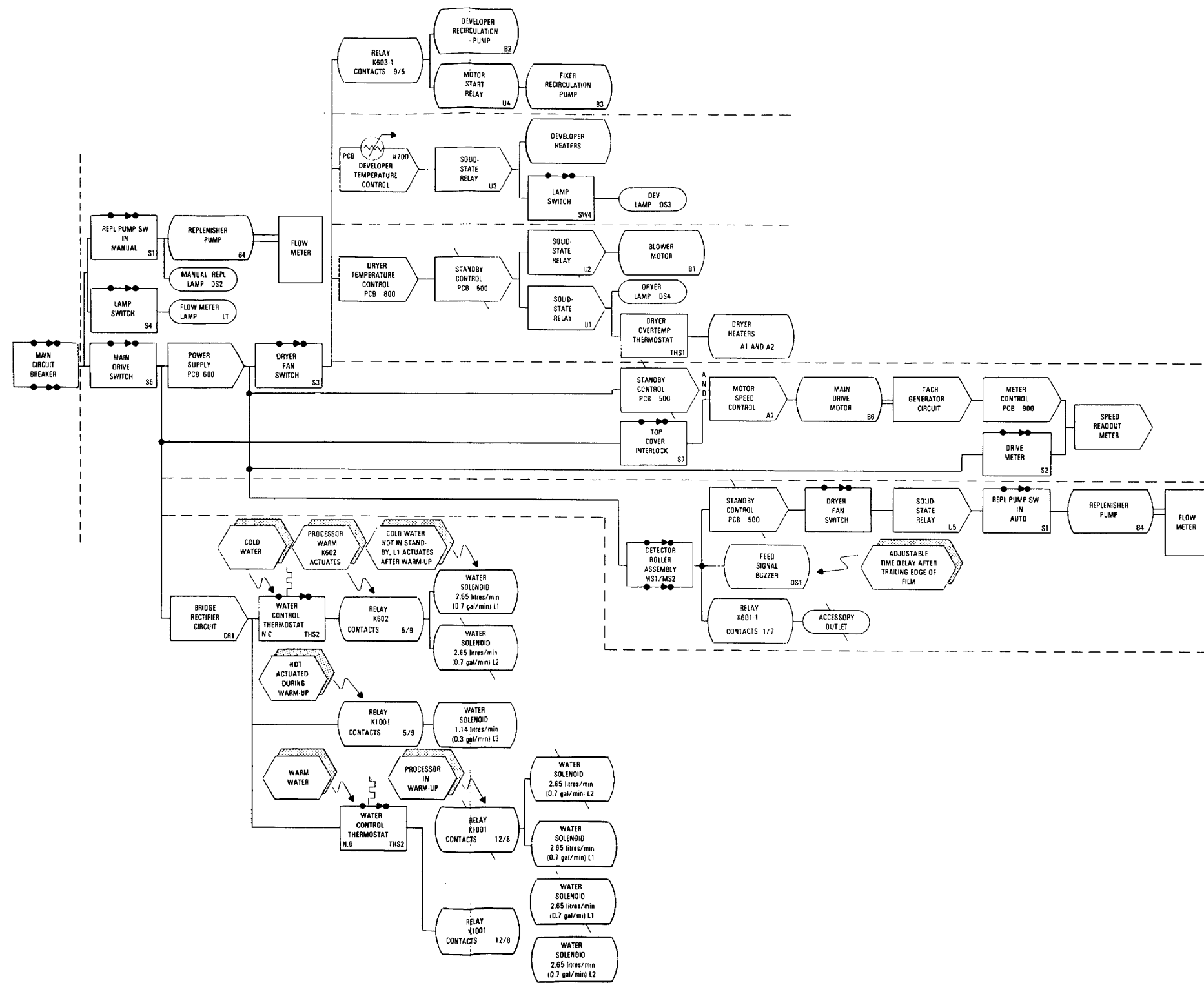
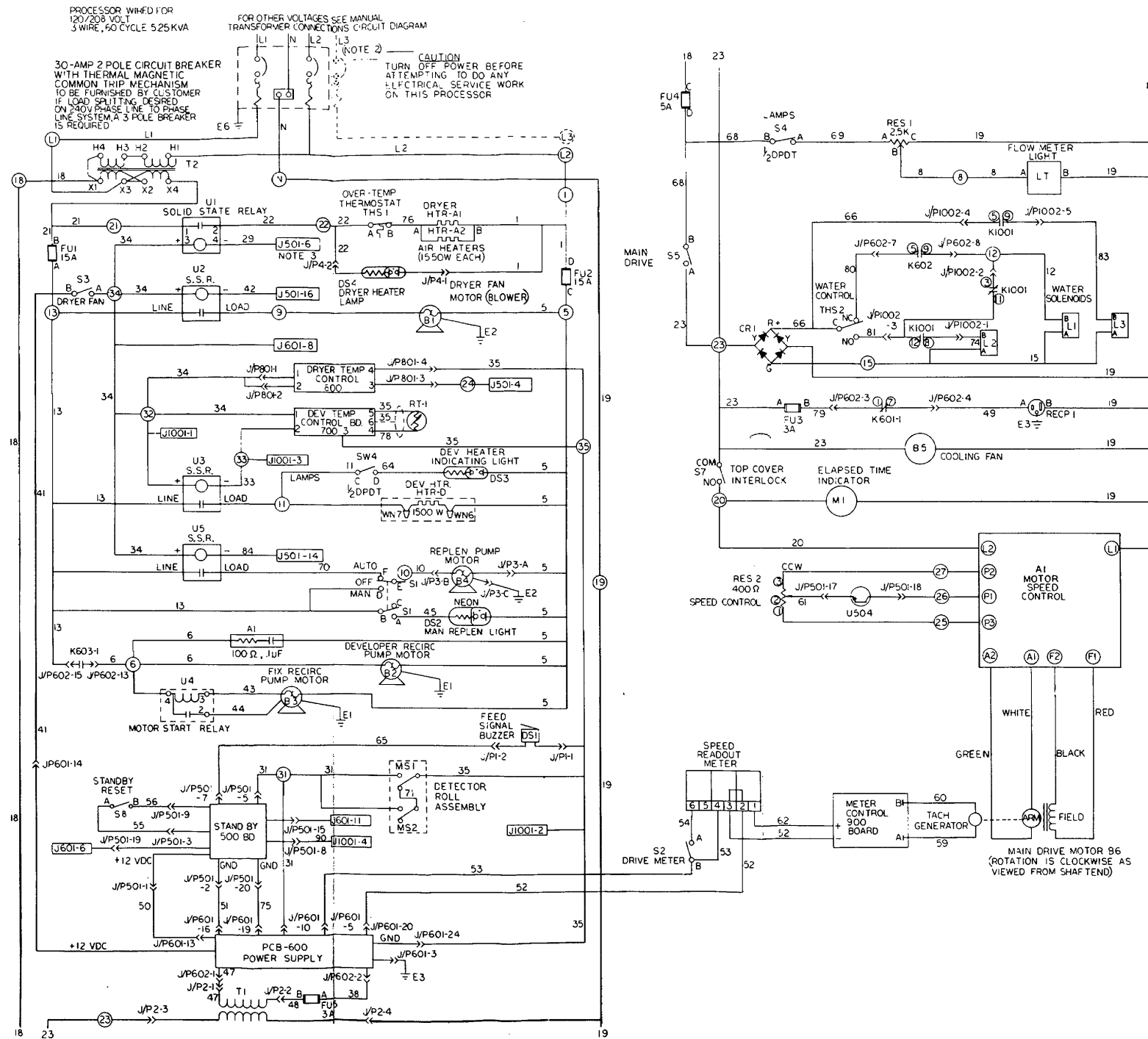


Figure FO2 Sequence of Operation Processor Complete FP-3/(FP-4 blank)



- NOTES:
1. CONNECTOR J501 IS ON THE STANDBY PRINTED CIRCUIT BOARD
CONNECTOR J601 IS ON THE POWER SUPPLY PRINTED CIRCUIT BOARD
 2. ONLY USED IF LOAD SPLITTING DESIRED ON 240 Ø TO Ø SYSTEM.
 3. J501-6 INDICATES SIGNAL DESTINATION IS 500 BOARD CONNECTOR 501 PIN 6.
 4. ○ INDICATES TERMINAL BOARD CONNECTION.

Figure FO3 Processor Circuit Diagram
FP-5/(FP-6 blank)

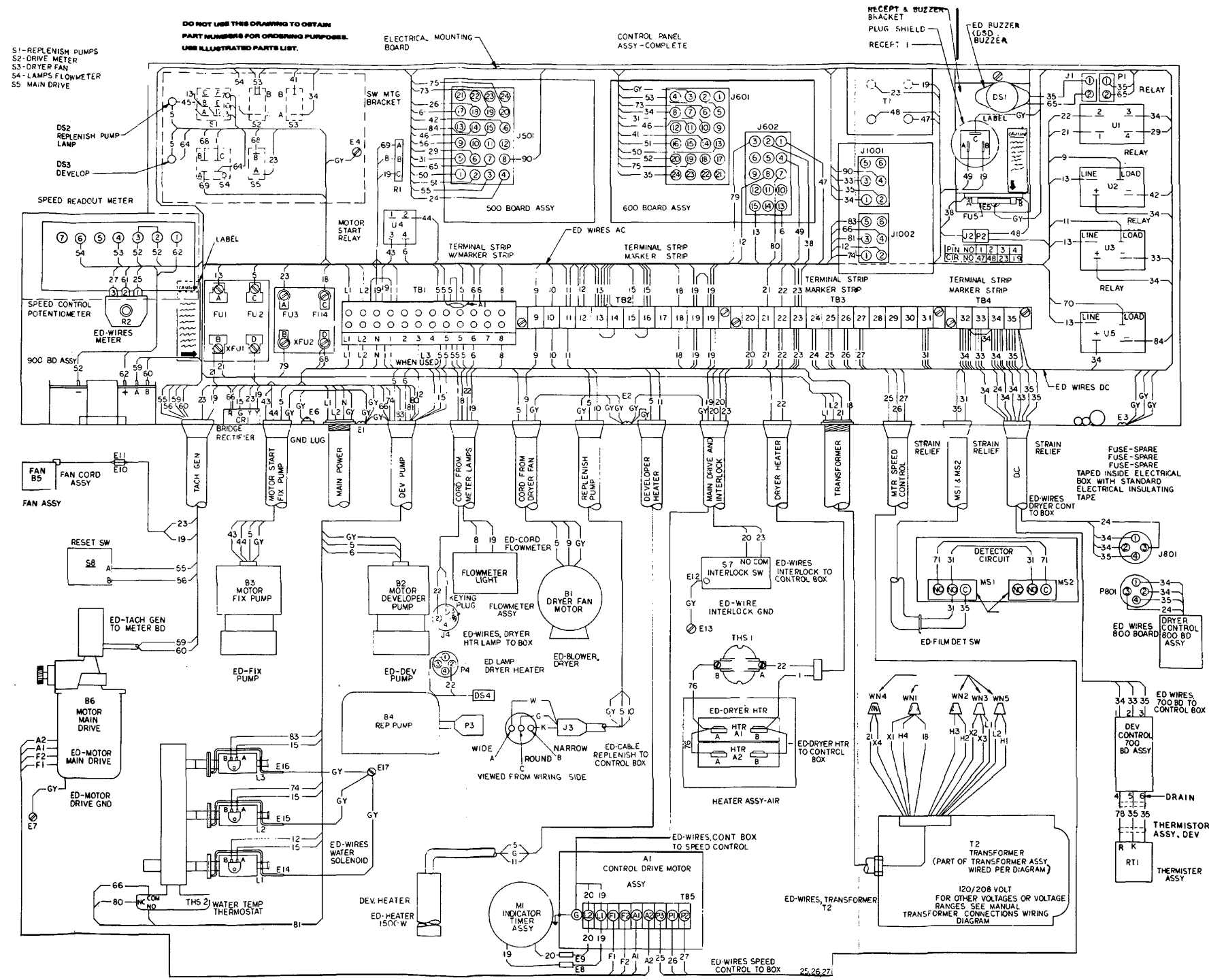
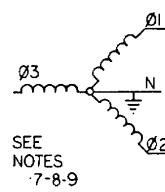
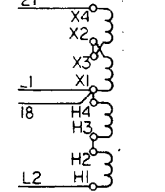
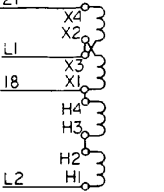
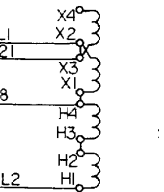
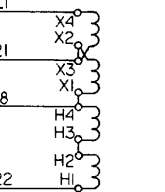
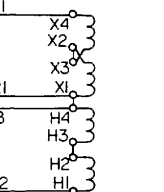
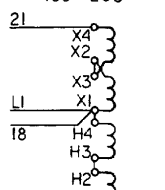
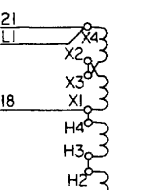
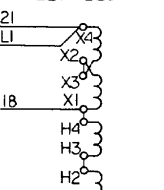
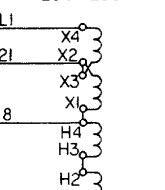
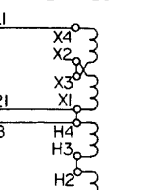
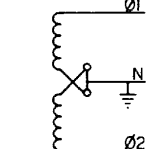
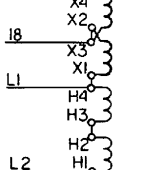
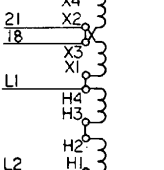
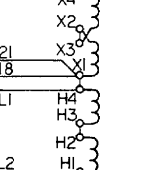
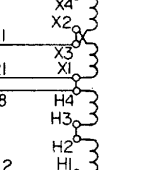
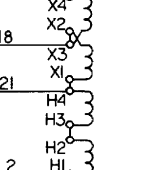
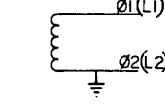
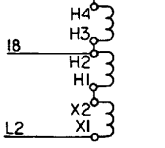
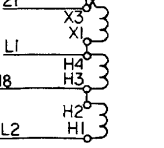
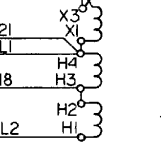
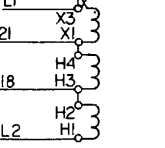
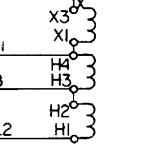
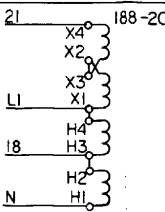
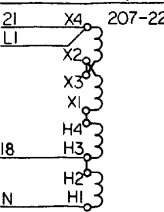
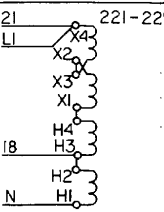
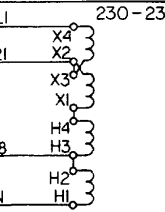
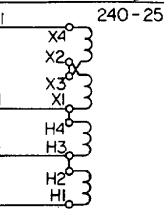
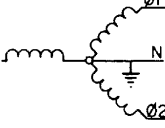
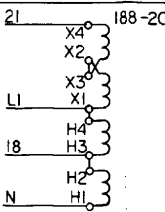
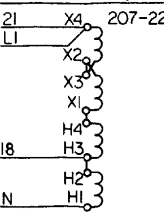
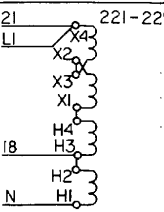
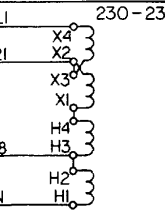
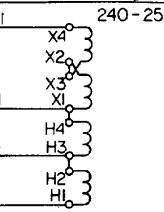


Figure FO4 Processor Wiring Diagram
 FP-7/(FP-8 blank)

POWER DISTRIBUTION SYSTEM	NOMINAL VOLTAGE & FREQUENCY	VOLTAGE RANGE Ø1 TO Ø2	VOLTAGE RANGE Ø1 TO Ø2	VOLTAGE RANGE Ø1 TO Ø2	VOLTAGE RANGE Ø1 TO Ø2	VOLTAGE RANGE Ø1 TO Ø2
	NOMINAL VOLTAGE Ø1 TO Ø2 BETWEEN 208 AND 240 60 Hz	188 - 206 	207 - 220 	221 - 229 	230 - 239 	240 - 254 
SAME AS ABOVE SEE NOTES 7-8-9	SAME AS ABOVE EXCEPT 50 Hz	188 - 206 	207 - 220 	221 - 229 	230 - 239 	240 - 254 
	NOMINAL VOLTAGE Ø1 TO Ø2 BETWEEN 208 AND 240 50/60 Hz	188 - 206 	207 - 220 	221 - 229 	230 - 239 	240 - 254 
	NOMINAL VOLTAGE Ø1 TO Ø2 BETWEEN 208 AND 240 50/60 Hz	188 - 206 	207 - 220 	221 - 229 	230 - 239 	240 - 254 
SEE NOTE 10		VOLTAGE RANGE Ø TO N 188 - 206 	VOLTAGE RANGE Ø TO N 207 - 220 	VOLTAGE RANGE Ø TO N 221 - 229 	VOLTAGE RANGE Ø TO N 230 - 239 	VOLTAGE RANGE Ø TO N 240 - 254 
	NOMINAL VOLTAGE Ø1 TO N BETWEEN 208 AND 240 50 Hz	VOLTAGE RANGE Ø TO N 188 - 206 	VOLTAGE RANGE Ø TO N 207 - 220 	VOLTAGE RANGE Ø TO N 221 - 229 	VOLTAGE RANGE Ø TO N 230 - 239 	VOLTAGE RANGE Ø TO N 240 - 254 

NOTES:

FOR THIS SERVICE, REWIRE AS FOLLOWS:

1. REMOVE WIRE 21 THAT CONNECTS U1 TO THE TERMINAL STRIP.
2. REMOVE JUMPER THAT CONNECTS TERMINAL STRIP POSITIONS 1 AND L2.
3. REMOVE END OF WIRE THAT GOES TO BUCK BOOST TRANSFORMER FROM TERMINAL L2. CONNECT THIS WIRE TO TERMINAL 2.
4. ADD JUMPER FROM TERMINAL N TO TERMINAL 1.
5. ADD JUMPER FROM TERMINAL L2 TO U1 (POSITION FROM WHICH YOU REMOVED WIRE 21).
6. ADD NEW JUMPER FROM TERMINAL N TO TERMINAL 2.

FOR LOAD SPLITTING ON THE FOLLOWING TWO POWER SYSTEMS, DO THE FOLLOWING:

7. BRING Ø3 INTO THE PROCESSOR AND CONNECT TO TB1-3.
8. REMOVE WIRE 21 THAT GOES FROM U1-1 TO TB3-21.
9. ADD NEW JUMPER FROM TB1-3 TO U1-1.

FOR TWO-WIRE SERVICE, REWIRE AS FOLLOWS:

10. ADD JUMPER FROM TERMINAL STRIP POSITION L2 TO POSITION N.

Figure FO5 Transformer Connections Diagram
FP-9/(FP-10 blank)

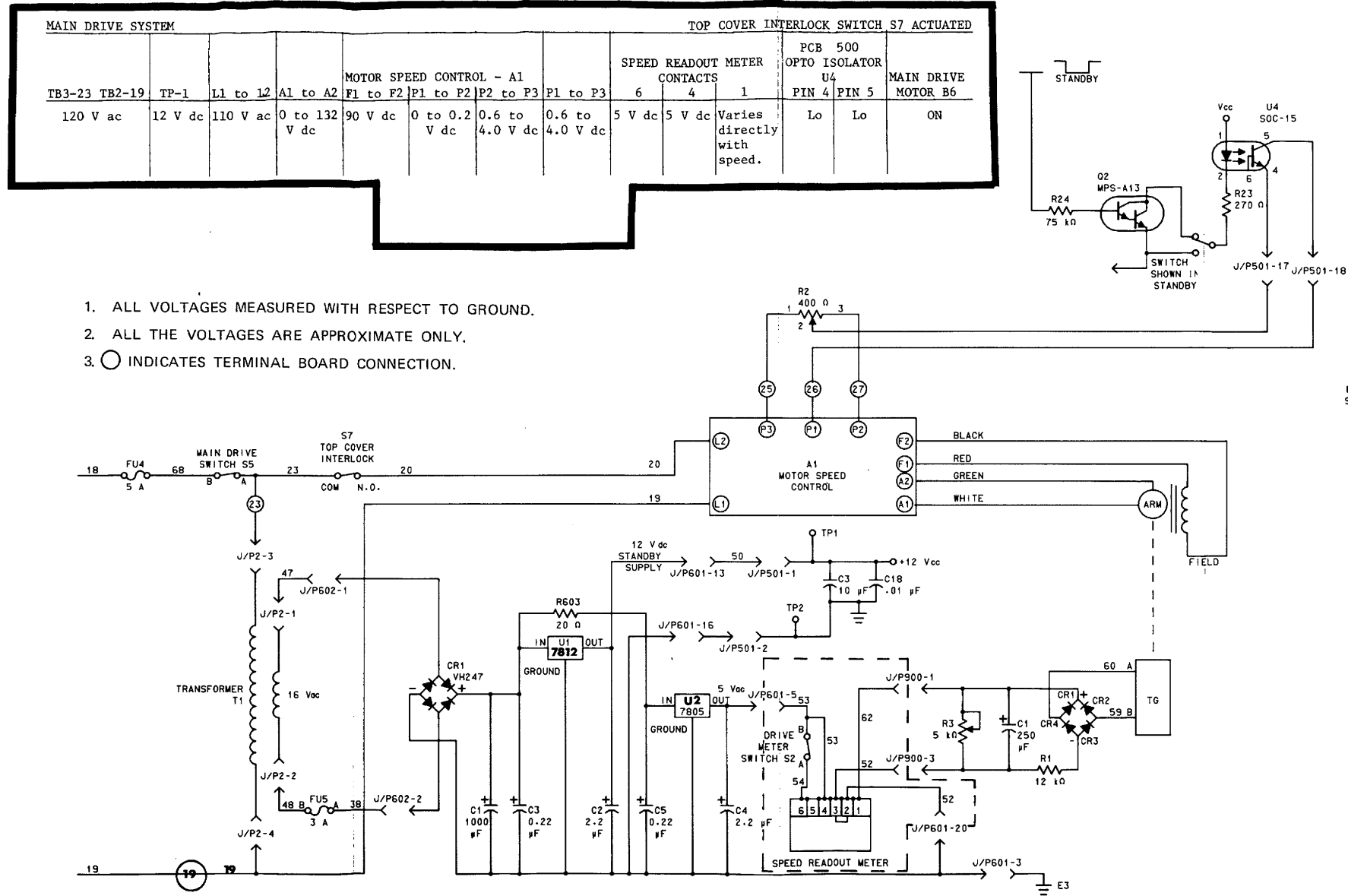
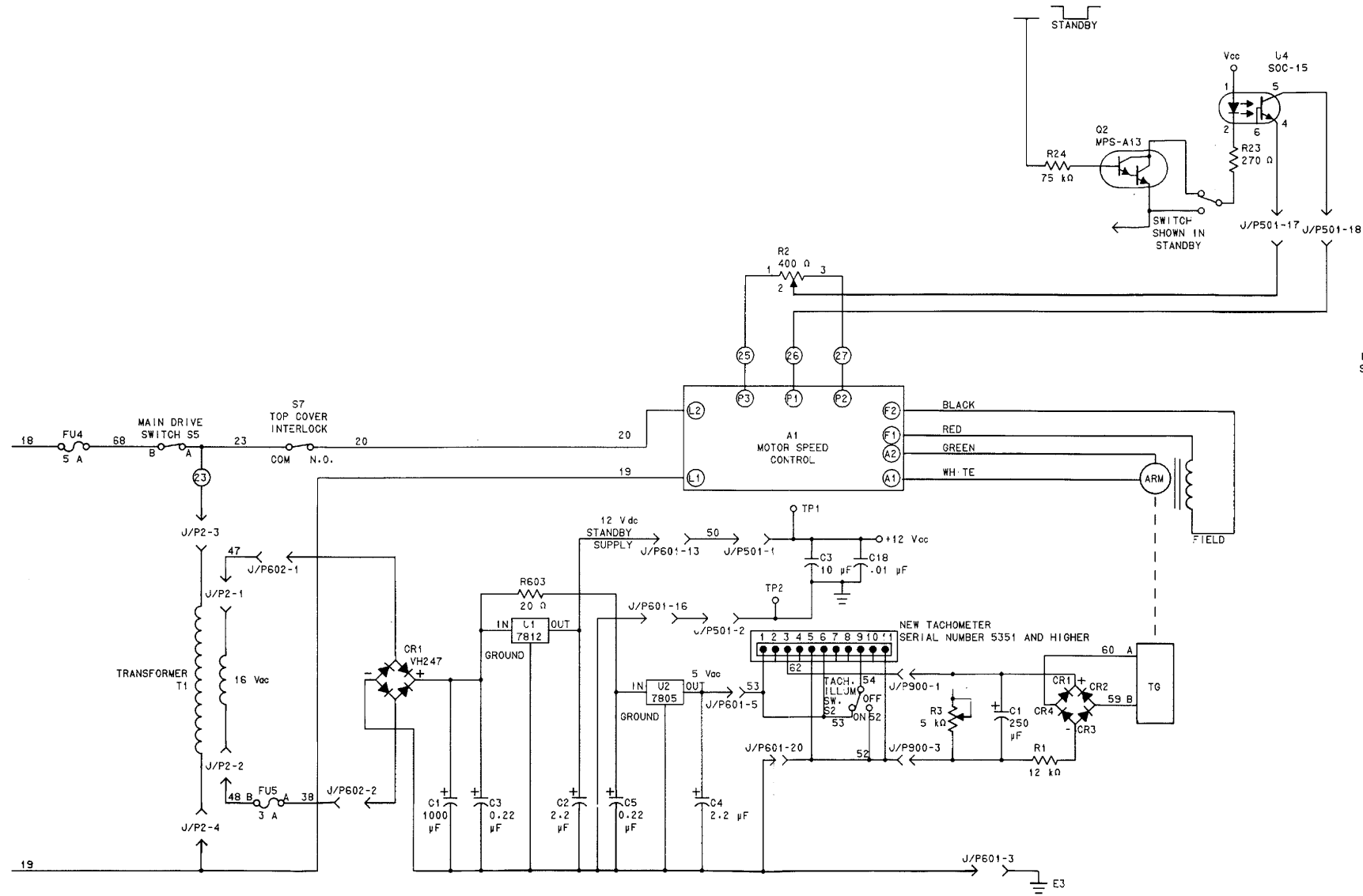


Figure FO6. Main Drive (Serial No. 5350 and lower)
 FP-11/(FP-12 blank)



NOTE
 IF THE FOLLOWING CONDITIONS EXIST,
 SEE THE STANDBY CONTROL CIRCUIT DIAGRAM:
 1) THE MAIN DRIVE CIRCUIT IS
 OPERATING CORRECTLY.
 2) THE PROCESSOR IS CONTINUALLY
 IN STANDBY AFTER THE STANDBY
 RESET SWITCH S8 IS ACTUATED.

Figure FO7. Main Drive (Serial No. 5351 and higher)

FP-13/(FP-14 blank)

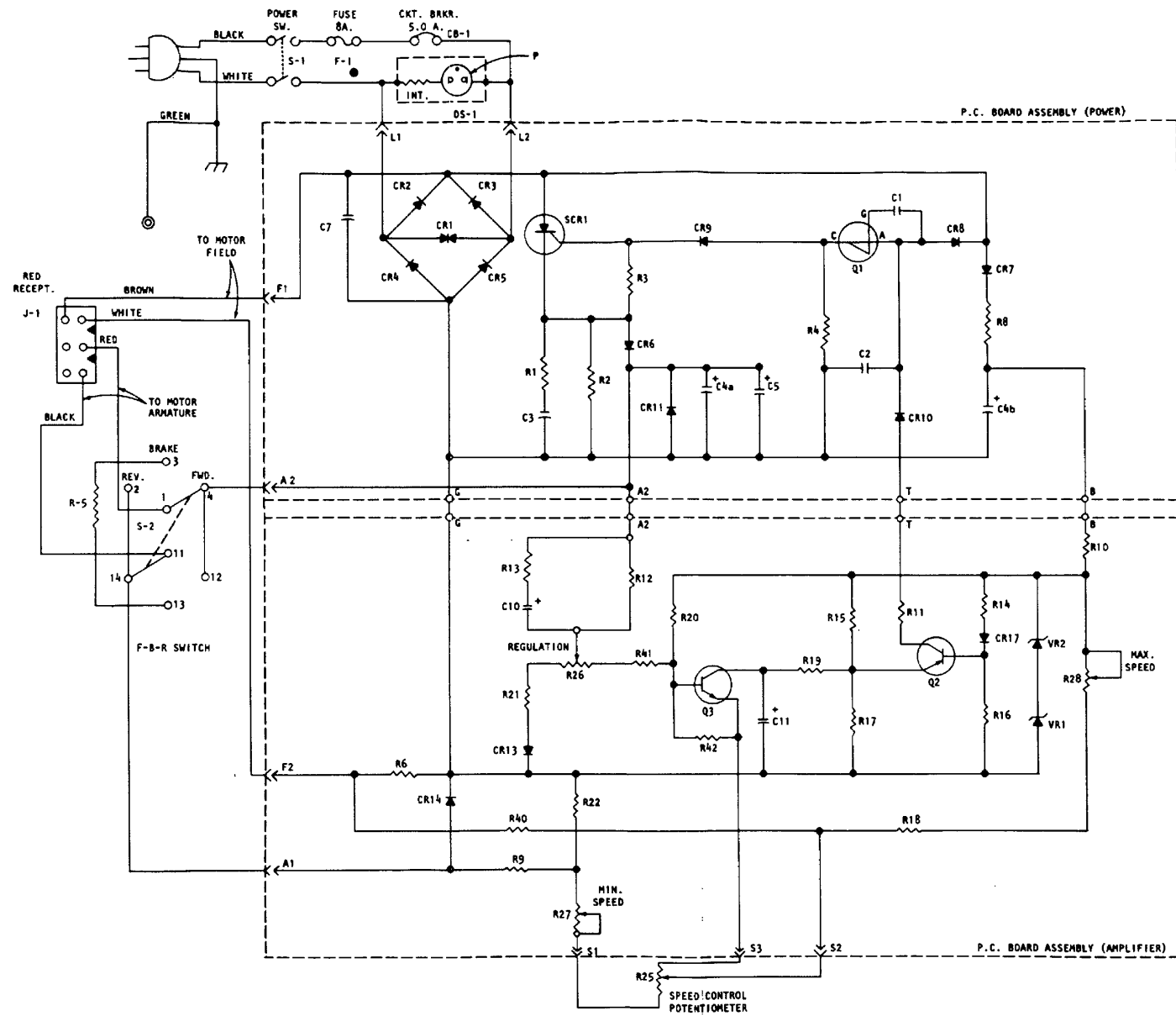


Figure FO8. Main Drive Controller Circuit Diagram
FP-15/(FP-16 blank)

DRYER TEMPERATURE	TB3-23 to TB2-19	TB4-34	PCB 800 TP1 to TP2	PCB 700 VOLTAGE COMPARATOR PIN 3 PIN 2 PIN 7			TB4-33
COLD (Ambient)	120 V ac	12 V dc	H1	H1	Lo	H1	Lo < 2 V
HOT (Oper. Temp)	120 V ac	12 V dc	H1	H1	Lo	Lo	H1 12 V
	WIRE 29 - U1 SOLID-STATE RELAY	SOLID-STATE RELAY - U1	DRYER HEATERS	WIRE 42 - U2 SOLID-STATE RELAY	U2	DRYER BLOWER	
	Lo	ENERGIZED	ON	Lo	ENERGIZED	ON	
	H1	DE-ENERGIZED	OFF	H1	DE-ENERGIZED	OFF	

NOTE

Main Drive Switch S5, Dryer Fan Switch S3, and Standby Reset Switch S8 actuated.

1. ALL VOLTAGES ARE MEASURED WITH RESPECT TO GROUND.
2. ALL VOLTAGES ARE APPROXIMATE ONLY.
3. ○ INDICATES TERMINAL BOARD CONNECTION.

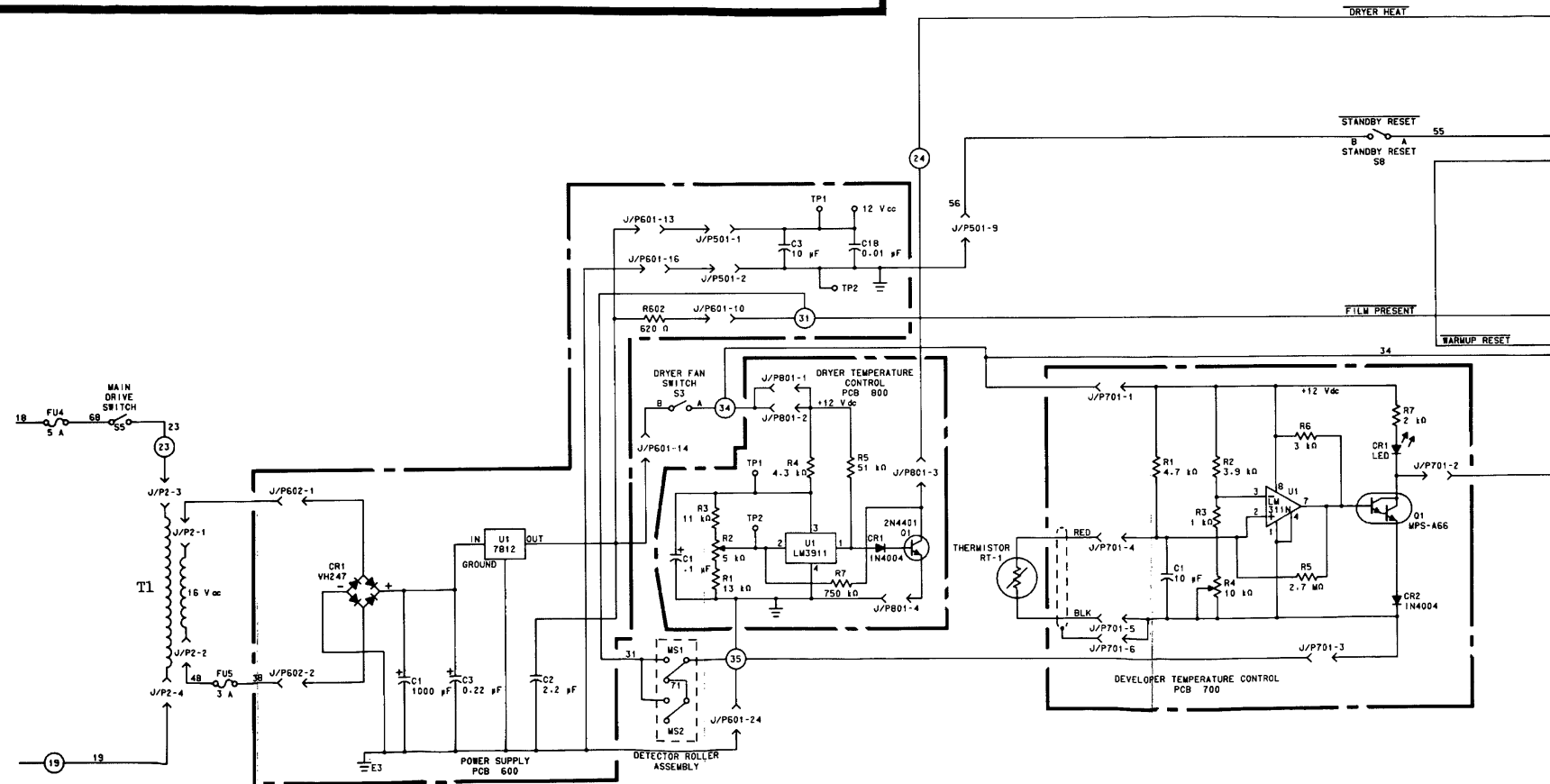


Figure FO9. Dryer Temperature Control
FP-17/(FP-18 blank)

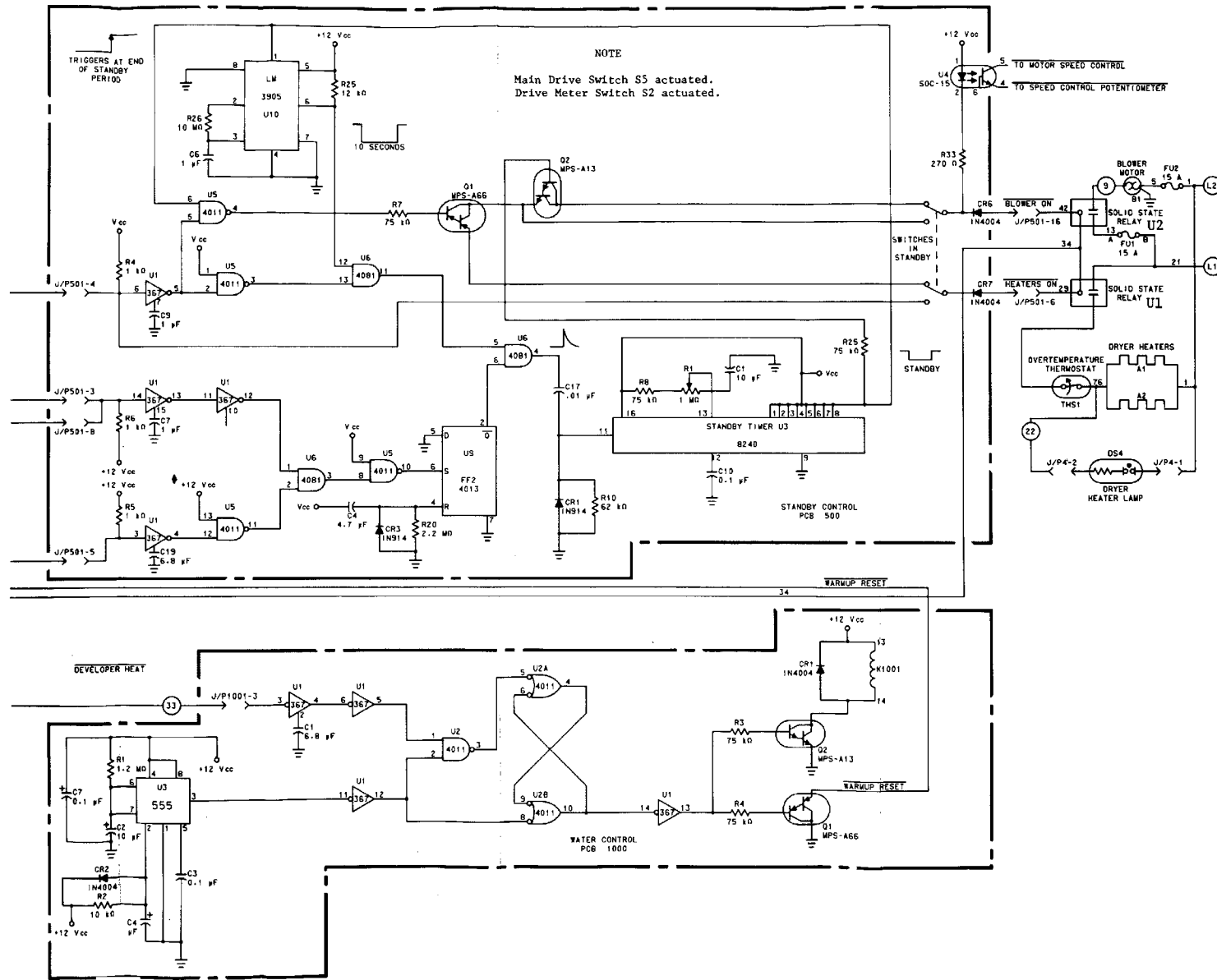


Figure FO10. Dryer Temperature Control
FP-19/(FP-20 blank)

1. ALL VOLTAGES MEASURED WITH RESPECT TO GROUND
2. ALL VOLTAGES ARE APPROXIMATE ONLY.
3. ○ INDICATES TERMINAL BOARD CONNECTION.

DEVELOPER TEMPERATURE	FROM		TO		PCB 700 VOLTAGE COMPARATOR U1			TB4-33	TB4-32	SOLID-STATE RELAY - U3	DEVELOPER HEATER
	TB3-23	TB2-19	TB4-34	TB4-34	PIN 3	PIN 2	PIN 7				
COLD (Ambient)	120 V ac	120 V ac	12 V dc	12 V dc	Hi	Lo	Hi	Lo < 2 V dc	Hi	ENERGIZED	ON
HOT (Oper. Temp)	120 V ac	120 V ac	12 V dc	12 V dc	Hi	Hi	Lo	Hi 12 V dc	Hi	DE-ENERGIZED	OFF

NOTE
Main Drive Switch S5 actuated.
Dryer Fan Switch S3 actuated.

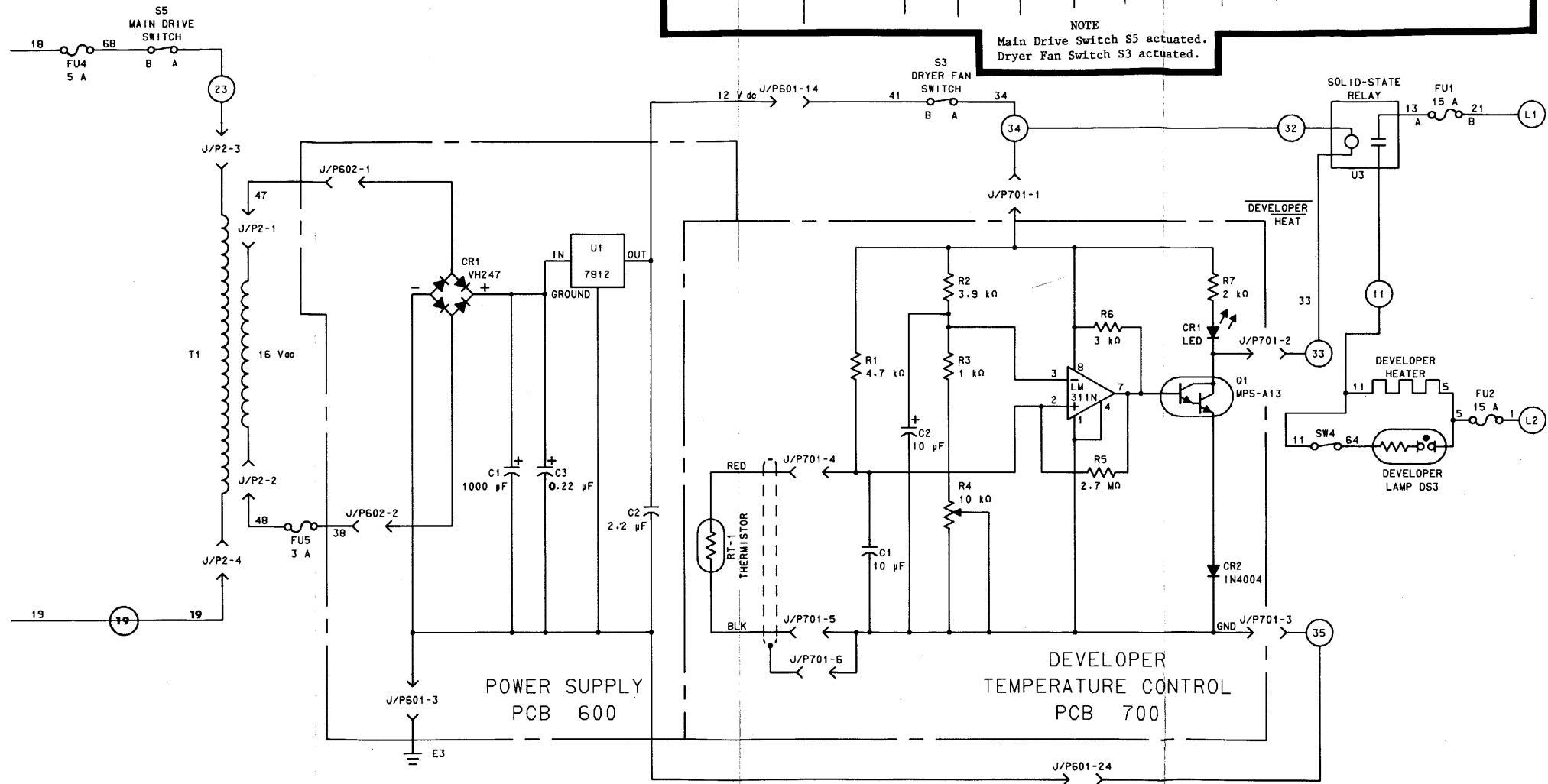


Figure FO11. Developer Temperature Control
FP-21/(FP-22 blank)

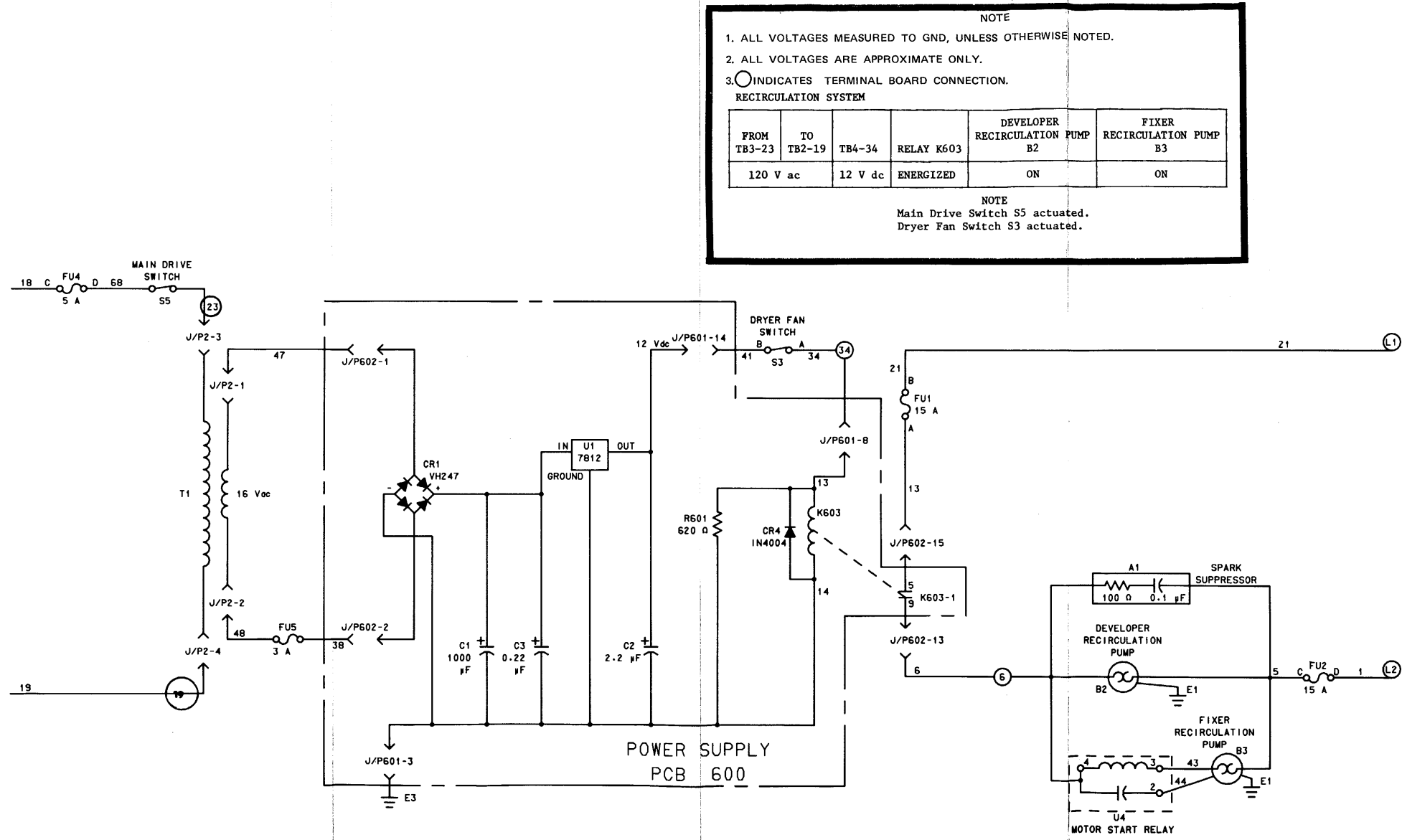
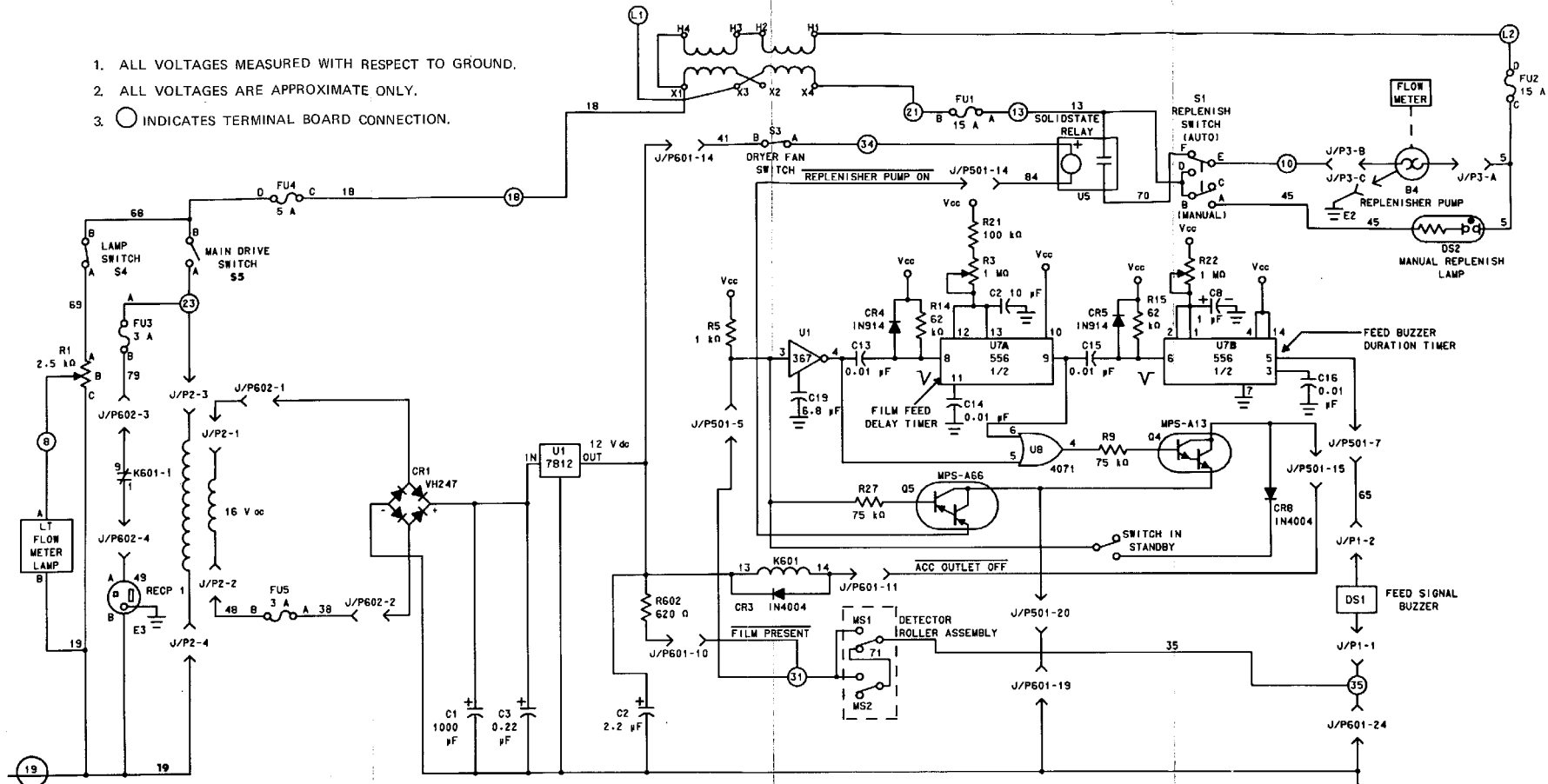


Figure FO12. Recirculation
FP-23/(FP-24 blank)



1. ALL VOLTAGES MEASURED WITH RESPECT TO GROUND.
2. ALL VOLTAGES ARE APPROXIMATE ONLY.
3. ○ INDICATES TERMINAL BOARD CONNECTION.

DETECTOR ROLLER ASSEMBLY (MS1) (MS2)	VOLTAGE		TB4-34	TB3-31	RELAY K601	SAFELIGHT	WIRE 84	SOLID-STATE RELAY-U5	REPLENISH PUMP
	FROM TB3-23	TO TB2-19							
FILM PRESENT	120 V ac	12 V dc	Lo	Lo	ENERGIZED	OFF	Lo	ENERGIZED	ON
FILM NOT PRESENT	120 V ac	12 V dc	Hi	Hi	DE-ENERGIZED	ON	Hi	DE-ENERGIZED	OFF

NOTE
Main Drive Switch S5 actuated.
Dryer Fan Switch S3 actuated.
Replenish Switch S1 in "AUTO" position.

Figure FO13. Replenishment
FP-25/(FP-26 blank)

1. ALL VOLTAGES ARE MEASURED WITH RESPECT TO GROUND.
2. ALL VOLTAGES ARE APPROXIMATE ONLY.
3. ○ INDICATES TERMINAL BOARD CONNECTION.

WATER TEMPERATURE	TB3-23 to TB2-19	TB4-34	PCB 700 VOLTAGE COMPARATOR U1			TB4-33	PCB 1000 U1	Contact 14
			PIN 3	PIN 2	PIN 7		PIN 13	K1001
COLD (Ambient)	120 V ac	12 V dc	Lo	Lo	Hi	Lo < 2 V	Lo	Hi
HOT (Oper. Temp)	120 V ac	12 V dc	Hi	Hi	Lo	Hi 12 V	Hi	Lo

(For other conditions, see the Circuit Description for the WATER CONTROL in the Theory Guide.)

RELAY K1001	L3 WATER SOLENOID	L2 WATER SOLENOID	PCB 500 PIN 14 U1	Contact 14 K602	RELAY K602	L1 WATER SOLENOID
DE-ENERGIZED	OFF	OFF	Hi	Lo	ENERGIZED	ON
ENERGIZED	ON	ON	Lo	Hi	DE-ENERGIZED	OFF

NOTE
Main Drive Switch S5 actuated.
Dryer Fan Switch S3 actuated.

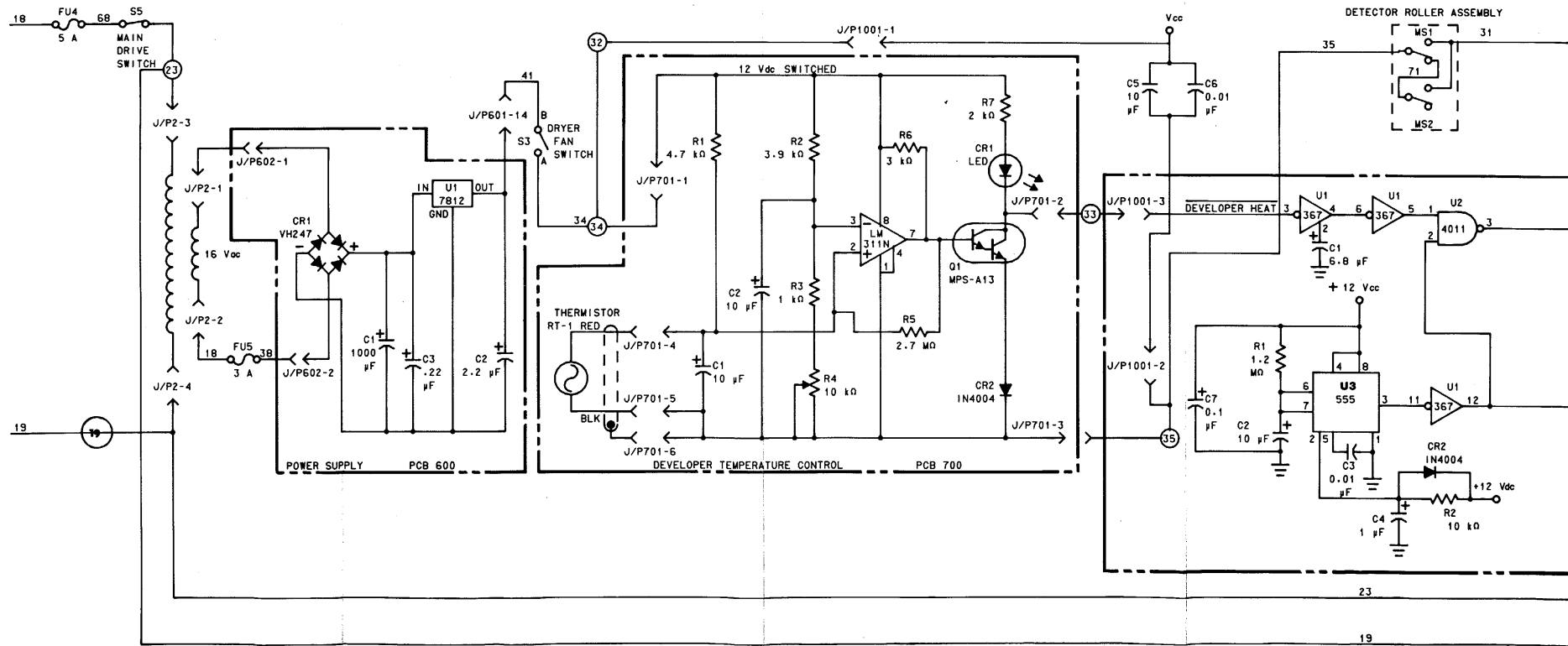


Figure FO14. Water Control
FP-27/(FP-28 blank)

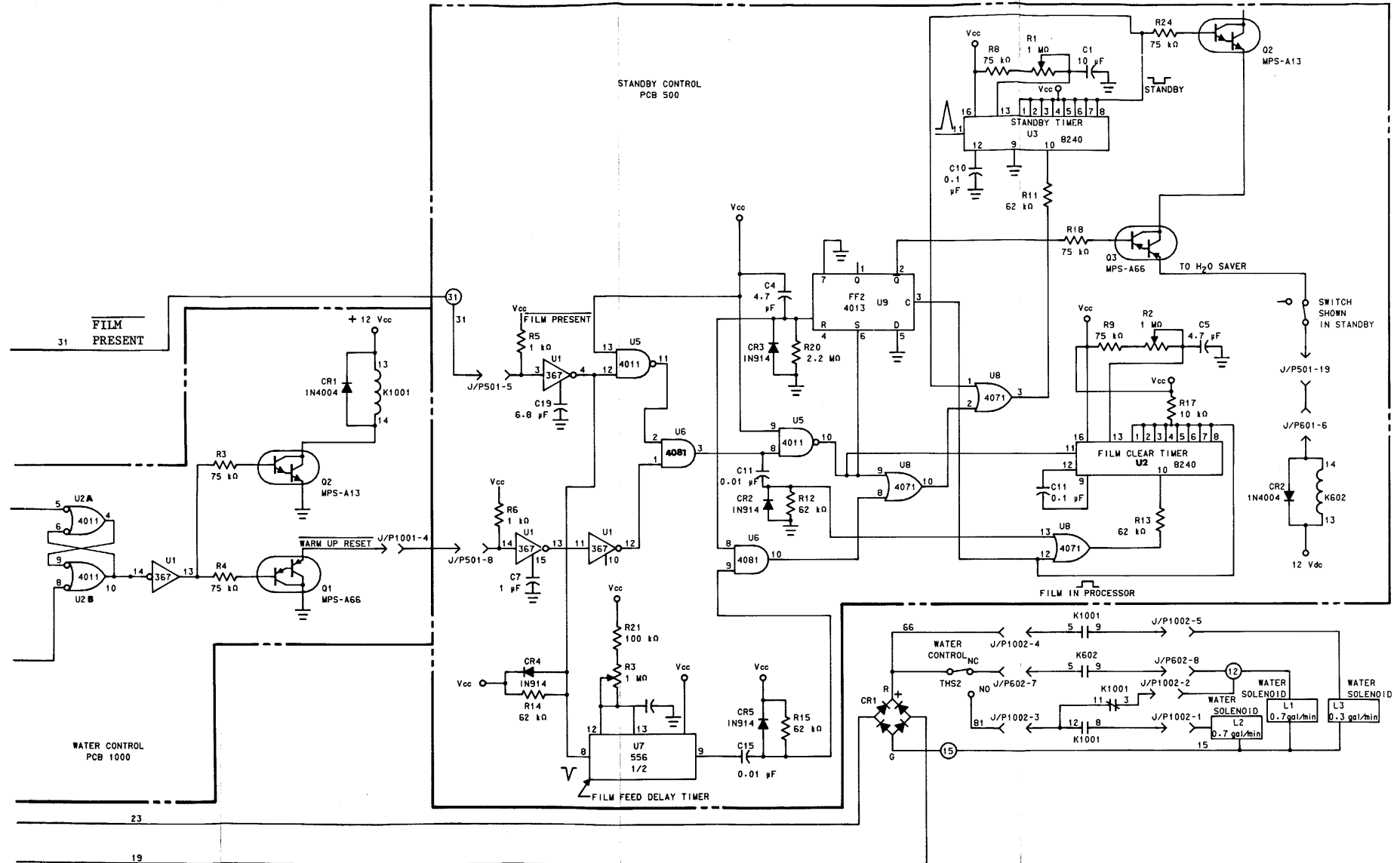
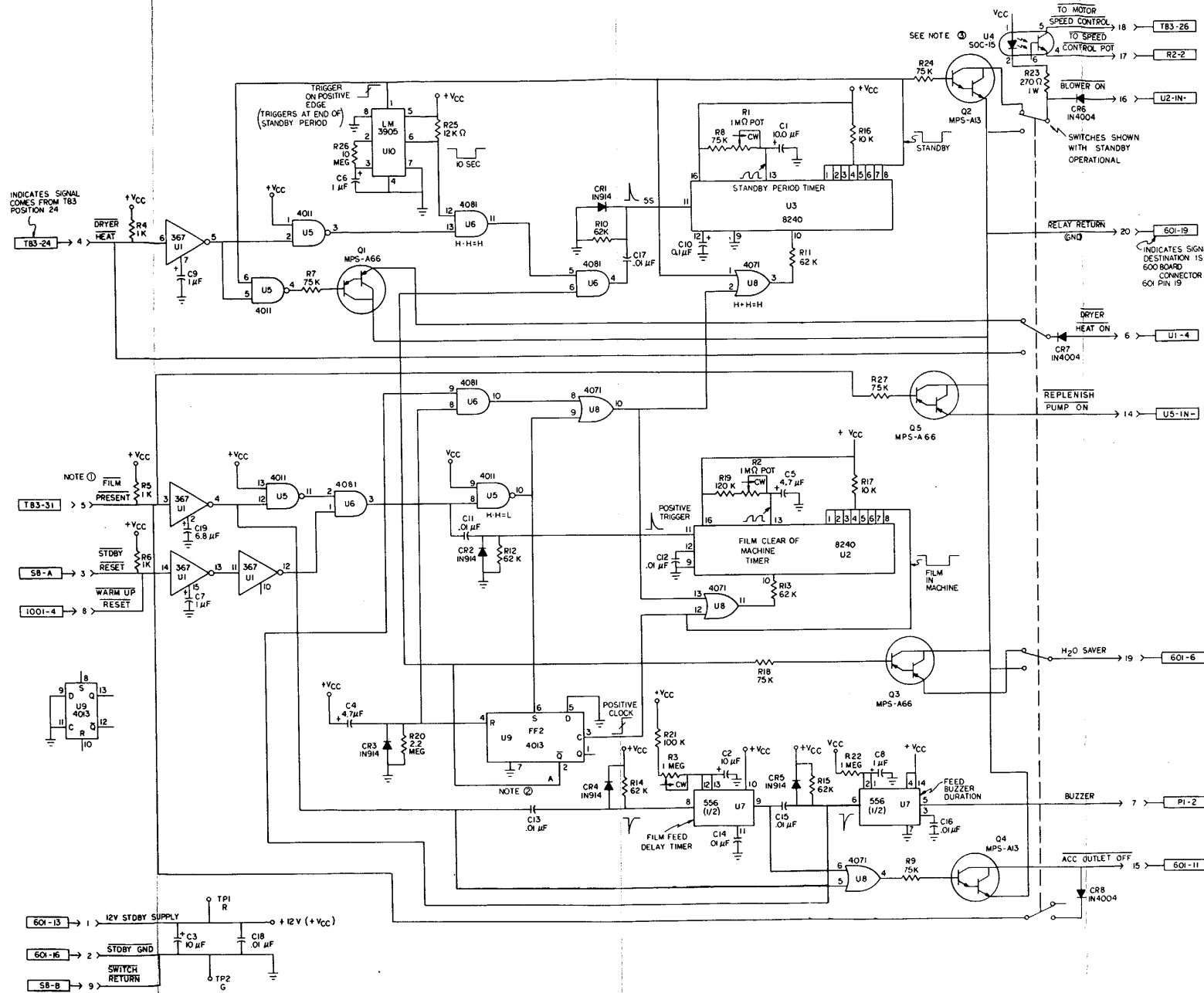


Figure FO15. Water Control
FP-29/(FP-30 blank)



NOTES:
 ① A LINE OVER THE NAME OF A SIGNAL MEANS THE NAME IS TRUE WHEN THE SIGNAL IS LOW. FOR EXAMPLE FILM PRESENT MEANS FILM IS GOING INTO THE MACHINE WHEN THIS LINE IS AT 0 (OR NEARLY 0) VOLTS.
 ② HIGH FOR FIRST 8 TO 10 SECONDS OF MACHINE ON
 ③ IS ALSO HIGH AFTER U2 TIMES OUT
 ④ U4 OFF, STOPS DRIVE MOTOR

Figure FO16. 500 Standby Control Circuit Board
 FP-31/(FP-32 blank)