TECHNICAL MANUAL

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

TOPOGRAPHIC SUPPORT SYSTEM FINISHING SECTION MODEL ADC-TSS-16 NSN 3610-01-105-6443

This manual together with TM 5-3610-253-14-2 supersedes TM 5-3610-253-14 dated 15 September 1983.

HEADQUARTERS, DEPARTMENT OF THE ARMY

3 SEPTEMBER 1985

TM 5-3610-253-14-1
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CHANGE NO. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 27 June 1988

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

TOPOGRAPHIC SUPPORT SYSTEM
FINISHING SECTION
MODEL ADC-TSS-16
NSN 3610-01-105-6443

TM 5-3610-253-14-1, 3 September 1985, is changed as follows:

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No. 2

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WASHINGTON, D.C., 21 March 1988

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

TOPOGRAPHIC SUPPORT SYSTEM
FINISHING SECTION
MODEL ADC-TSS-16 NSN 3610-01-105-6443

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CHANGE NO. 1

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

TOPOGRAPHIC SUPPORT SYSTEM
FINISHING SECTION
MODEL ADC-TSS-16
NSN 3610-01-105-6443

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Remove pages	Insert pages
1-11 and 1-12	1-11 and 1-12
1-53 and 1-54	1-53 and 1-54
1-61 and 1-62	1-61 and 1-62
1-69 and 1-70	1-69 and 1-70
1-97 and 1-98	1-97 and 1-98
3-7 and 3-8	3-7 and 3-8
3-33 and 3-34	3-33 and 3-34
4-31 and 4-32	4-31 and 4-32
4-39 and 4-40	4-39 and 4-40
5-1 and 5-2	5-1 and 5-2
5-33 and 5-34	5-33 and 5-34
5-165 and 5-166	5-165 and 5-166
5-239 and 5-240	5-239 and 5-240
5-427 and 5-428	5-427 and 5-428
5-453 and 5-454	5-453 and 5-454

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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 Finishing Section, Topographic Support System, Model ADC-TSS-16 (TM 5-3610-253 Series)

WARNING

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

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

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

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

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

For Artificial Respiration refer to FM 21-11.

WARNING

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

WARNING

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

WARNING

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

INTRODUCTION

This manual is divided into two volumes:

Volume I, TM 5-3610-253-14-1, consists of Chapters 1 through Chapter 5.
Volume II, TM 5-3610-253-14-2, consists of Chapters 6 through Chapter 9, Appendixes A through E, Glossary and Index.

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

TECHNICAL MANUAL

NO. 5-3610-253-14-1

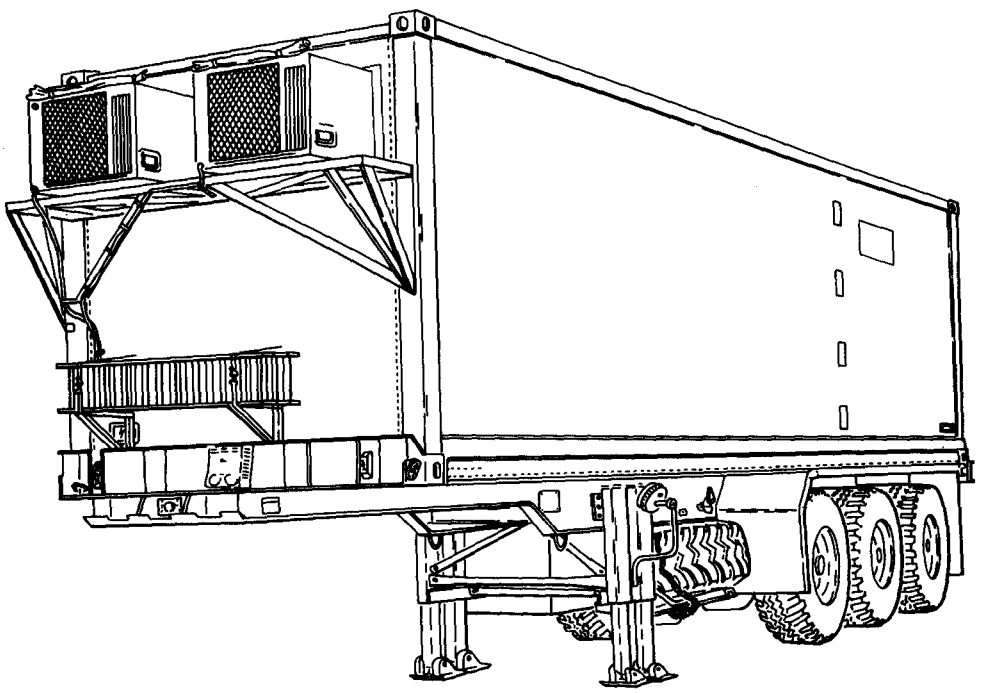
HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 3 September 1985

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

TOPOGRAPHIC SUPPORT SYSTEM
FINISHING SECTION, MODEL ADC-TSS-16
NSN: 3610-01-105-6443

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake 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 direct to: Commander, U.S. Army Troop Support Command, ATTN: AMSTR-MCTS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.



CHAPTER 1
FINISHING SECTION

Section I. INTRODUCTION

1-1 GENERAL INFORMATION.

1-1.1 ***Scope.*** This manual contains operating and maintenance instructions for the ADC-TSS-16, Finishing Section, Topographic Support System (TSS). The purpose of the Finishing Section is to bind, drill, and package finished topographic products. The trailer chassis is covered in TM 5-2330-305-14, Operator, Organizational, Direct Support and General Support Maintenance Manual, Topographic Support System, Chassis, Semitrailer, ISO Container Transporter. Repair parts and special tools are listed in TM 5-3610-253-24P, Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List, Finishing Section, Topographic Support System. Lubrication instructions are contained in LO 5-3610-253-12, Lubrication Order, Finishing Section, Topographic Support System. All authorized equipment, supplies, and their locations for transport are shown in Location and Description of Major Components of this manual.

1-1.2 ***Purpose of Equipment.*** To provide a transportable facility for cutting printed material to format size; binding, drilling, and packaging finished products; disposal of printed waste by shredding and storing photographic supplies.

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

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

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

1-1.6 ***Preparation for Storage or Shipment.***

a. Perform your preparation for movement procedures.

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

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

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

1-2. EQUIPMENT DESCRIPTION.

1-2.1 Equipment Characteristics, Capabilities, and Features

a. Air and sea transportable.

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

c. Controlled internal environment.

1-2.2 Special Considerations.

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

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

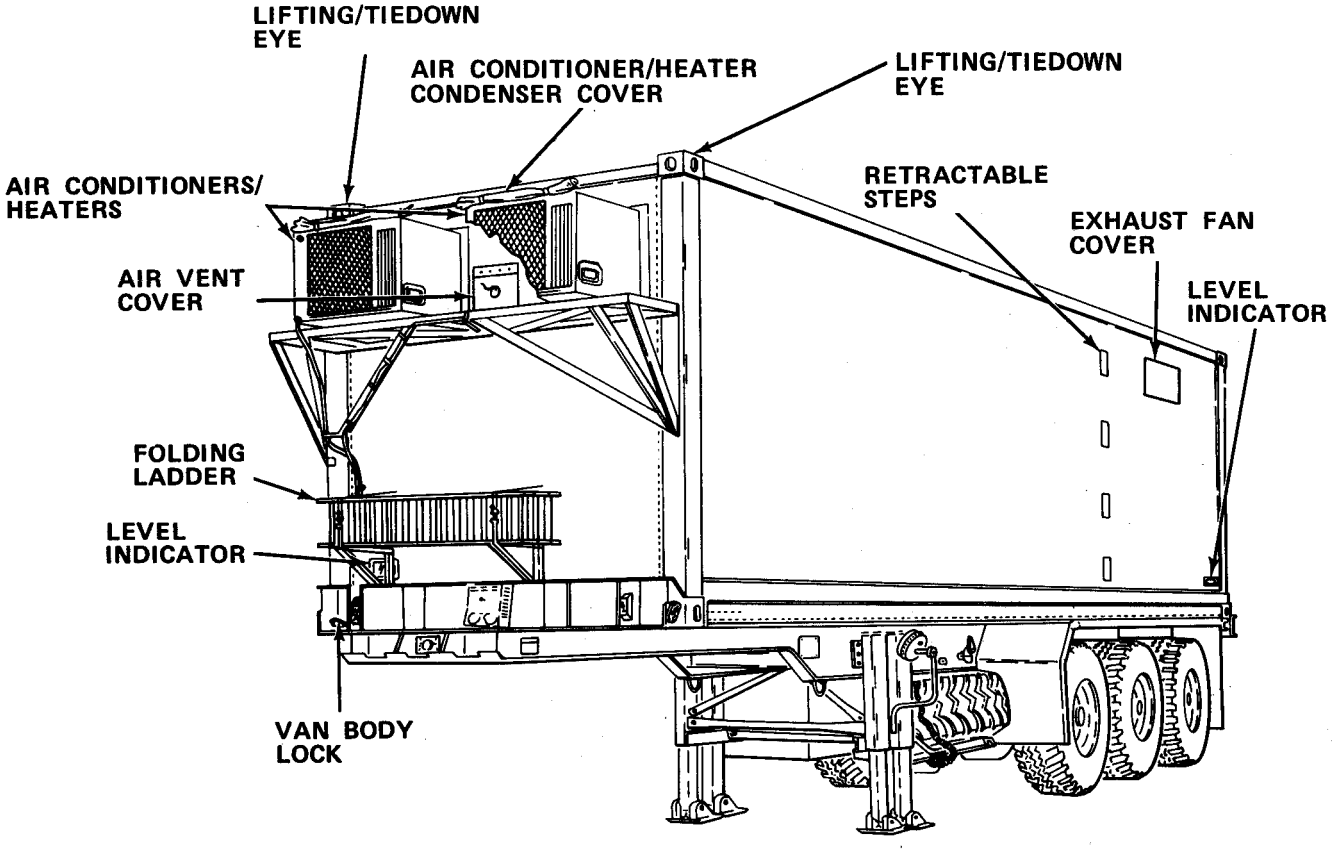
c. During site selection, avoid overhead power transmission lines to prevent danger from electric shock or electromagnetic interference.

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

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

1-2.3 Location and Description of Major Components.

a. Roadside Exterior.



VAN BODY LOCK. Locks van body to trailer chassis.

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

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

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

AIR VENT COVER. Covers air vent opening.

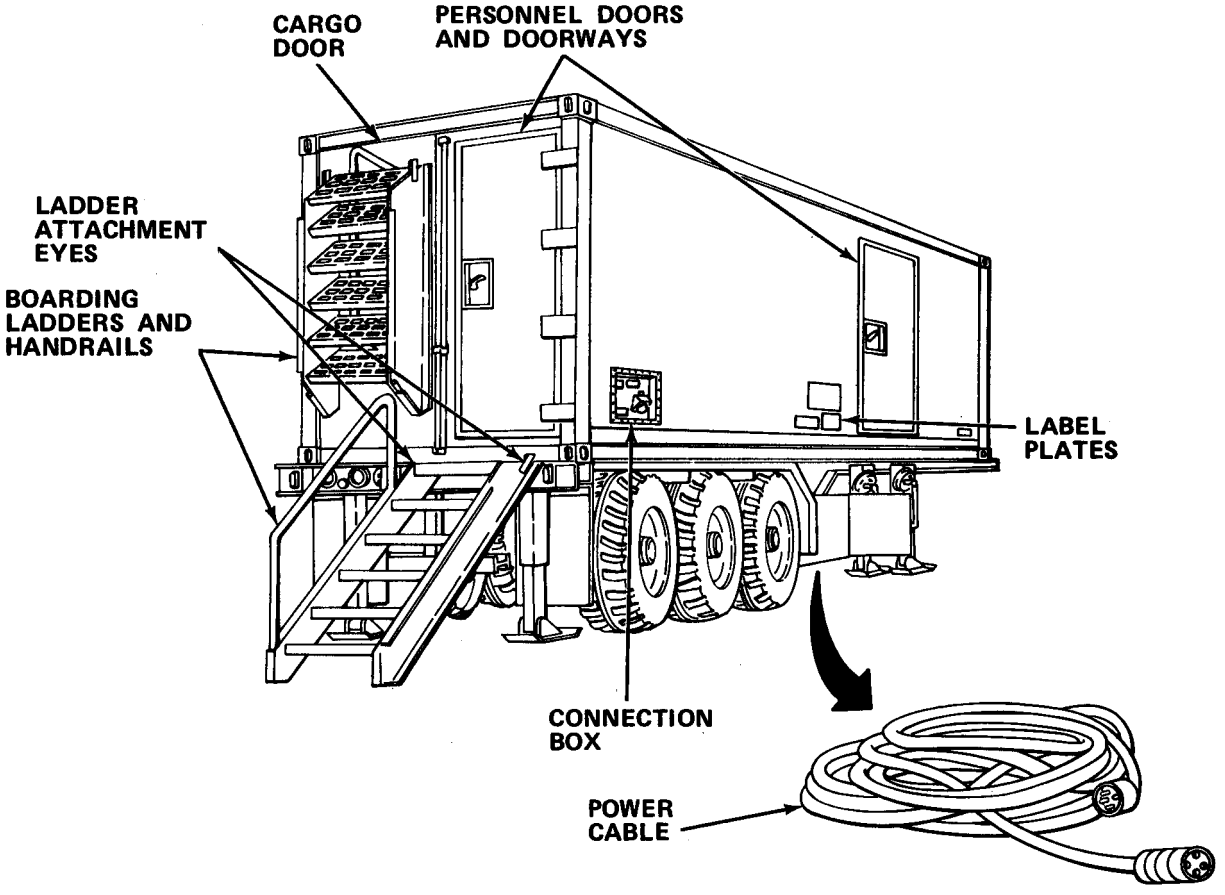
RETRACTABLE STEPS. Provide access to roof.

EXHAUST FAN COVER. Covers exhaust fan opening.

LEVEL INDICATORS. Indicate van body inclination.

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

b. Curbside Exterior.



CARGO DOOR. Access for equipment removal/installation.

PERSONNEL DOORS. Doors are 26.75 in. (67.9 cm) wide by 70.5 in. (178.8 cm) high.

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

LABEL PLATES. Provide weight/moment data.

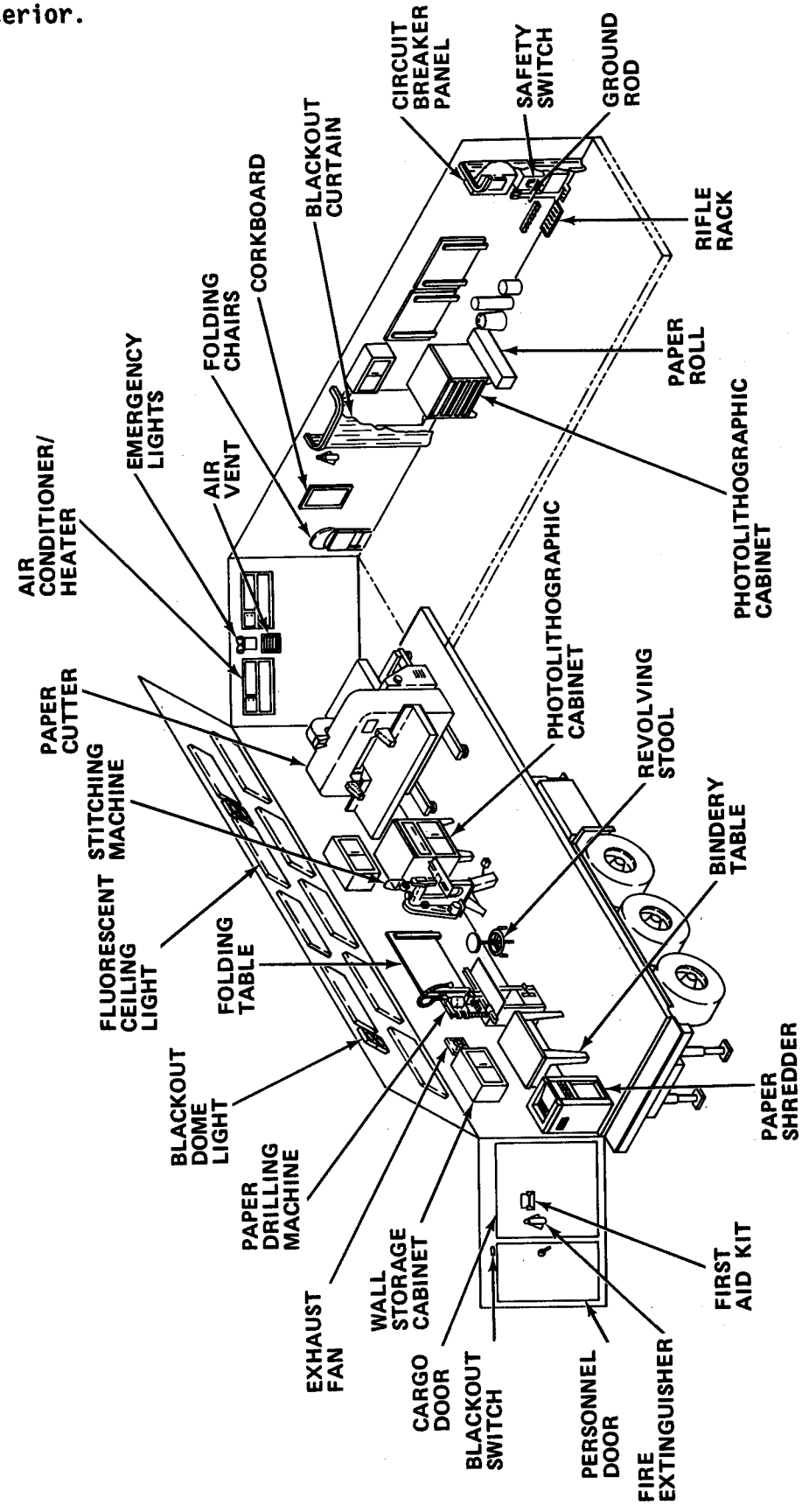
POWER CABLE. Power cable is in 50 ft (15.2 m) sections. (Stored in trailer chassis storage box.)

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

LADDER ATTACHMENT EYES. Attachment points for boarding ladders.

BOARDING LADDERS AND HANDRAILS. Provide access to section.

c. Interior.


CIRCUIT BREAKER PANEL
SAFETY SWITCH
GROUND ROD
BLACKOUT CURTAIN
CORKBOARD
FOLDING CHAIRS
EMERGENCY LIGHTS
AIR VENT
AIR CONDITIONER/ HEATER
RIFLE RACK
PAPER ROLL
PHOTOLITHOGRAPHIC CABINET
PHOTOLITHOGRAPHIC CABINET
REVOLVING STOOL
BINDERY TABLE
PAPER CUTTER
STITCHING MACHINE
FLUORESCENT CEILING LIGHT
FOLDING TABLE
BLACKOUT DOME LIGHT
PAPER DRILLING MACHINE
PAPER SHREDDER
EXHAUST FAN
WALL STORAGE CABINET
FIRST AID KIT
CARGO DOOR
BLACKOUT SWITCH
PERSONNEL DOOR
FIRE EXTINGUISHER

PERSONNEL DOOR. Weatherproof, fitted with blackout switch.

BLACKOUT SWITCH. Turns ceiling lights off when activated.

CARGO DOOR. Access for equipment removal/installation.

WALL STORAGE CABINET. Storage.

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

PAPER DRILLNG MACHINE. Makes holes in paper products.

FOLDING TABLE. Work surface. Stores against wall.

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

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

STITCHING MACHINE. Staples paper products.

PAPER CUTTER. Cuts and trims stock paper.

AIR CONDITIONER/HEATER. Internal environmental control.

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

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

FOLDING CHAIRS. Storage for transport.

CORKBOARD. Vertical display board.

BLACKOUT CURTAIN. Lightproof cover for personnel door.

CIRCUIT BREAKER PANEL. Circuit breakers with phase test indicator.

SAFETY SWITCH. Main power safety disconnect switch.

GROUND ROD. Electrical ground for section.

RIFLE RACK. Weapon storage.

PAPER ROLL. Wrapping paper for finished products.

PHOTOLITHOGRAPHIC CABINETS. Lightproof storage.

REVOLVING STOOL. Adjustable height.

BINDERY TABLE. Work station.

PAPER SHREDDER. Shreds waste paper.

FIRST AID KIT. Limited first aid supplies.

FIRE EXTINGUISHER. Dry chemical fire extinguisher.

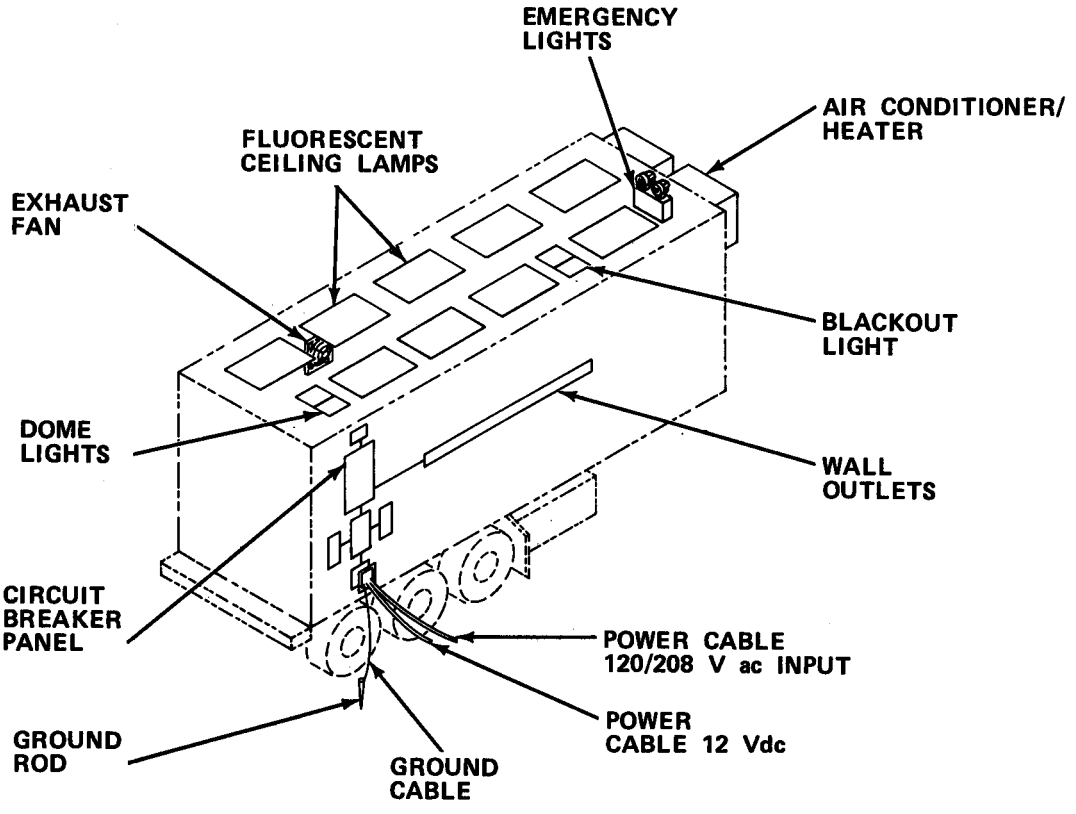
1-2.4 Equipment Data - IS0 Container (Unmounted).

Dimensions	
Length	31.75 ft (9.68m)
Width	8 ft (2.44m)
Height	8 ft (2.44m)
Cubage	2038 ft^3 (57.7 m^3)
Connections	
Telephones	One telephone (three-post) connection
Power	21.6 kW. One 120/208 V, three-phase, four-wire connection and one 12 V dc connection
Ground	Ground lug
Air Conditioner/Heater (Two Units)	
Cooling	18,000 Btu/hr (5274 W) each
Heating	14,300 Btu/hr (4190 W) (Max) each
Power Requirements	208 V, 60 Hz, three-phase
Exhaust Fan	289 ft^3/min (8.18 m^3/min)
Air Vent	289 ft^3/min (8.18 m^3/min)
Weight	
Gross (Container and Chassis)	28,990 lbs (13,146.97 kg)
Tare (Container Only)	17,550 tlbs (7958.93 kg)

1-3. TECHNICAL PRINCIPLES OF OPERATION.

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

1-3.2 Electrical System.



GROUND ROD. Used to ground section.

GROUND CABLE. Used with ground rod.

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

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

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

EXHAUST FAN. Plug - in fan. Separately fused.

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

EMERGENCY LIGHTS. Battery powered. Activated by power loss.

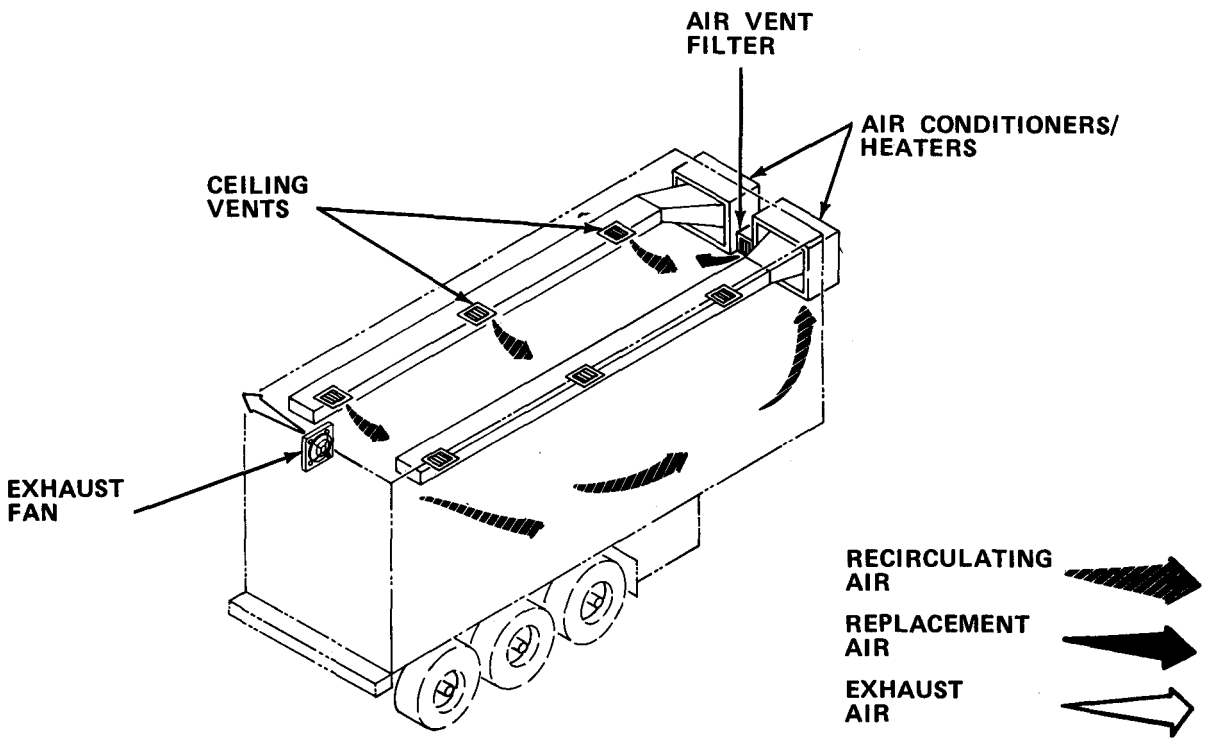
AIR CONDITIONER/HEATER. Air conditioner and electrical heater powered by three-phase, 208 V, 30 amp current.

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

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.



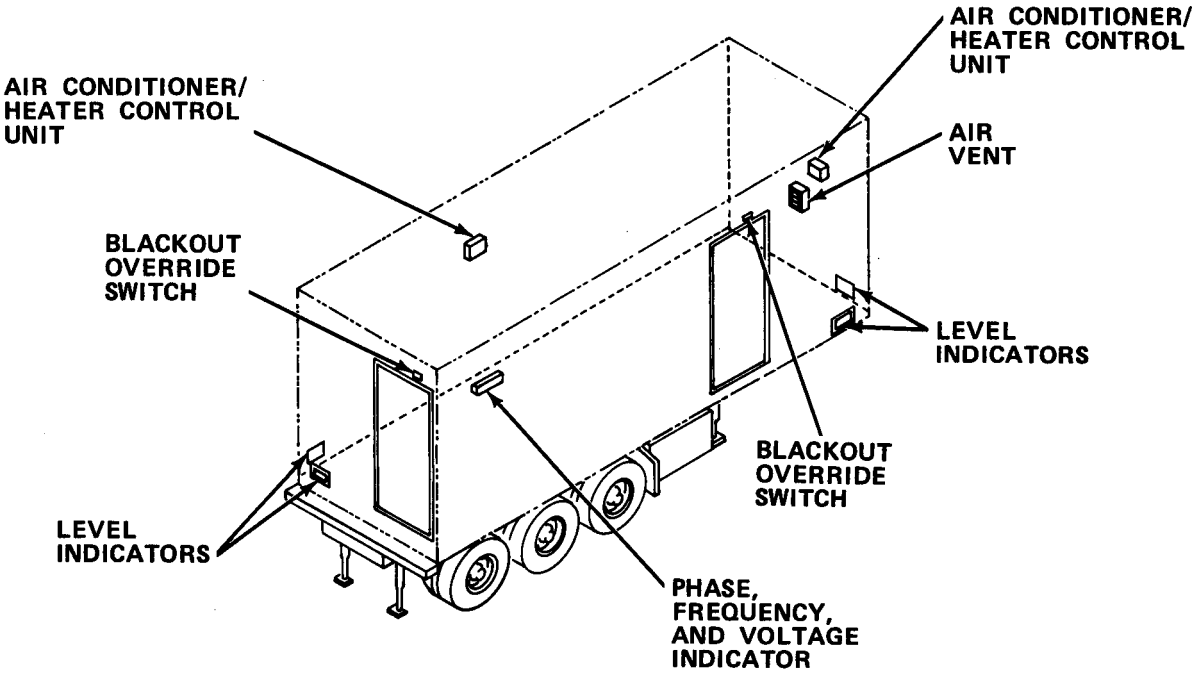
Exhaust fan exhausts air. Replacement air flows into the section through the air vent filter. Recirculating air is filtered as it enters the air conditioners/heaters. From the air conditioners/heaters, it flows through the ceiling vents and into the section.

NOTE

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

Section II OPERATING INSTRUCTIONS

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



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

1-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

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

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

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

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

1-5.1 PMCS Procedures.

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

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

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

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

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

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

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

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

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

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

Item	Quantity
Wire Brush	1 ea
6 in. Adjustable Wrench	1 ea
Flat Tip Screwdriver	1 ea
Vacuum Cleaner	1 ea
Cheesecloth (Item 6, Appendix E)	ar
General Purpose Detergent (Item 8, Appendix E)	ar
Paint (Item 18, 18A, and 18B, Appendix E)	ar
Paint Brushes	ar

Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

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

B - Before
D - During
A - After

W-Weekly
M - Monthly
Q-Quarterly

AN - Annually
S - Semiannually
Bl - Biennially

(Number) - Hundreds of Hours

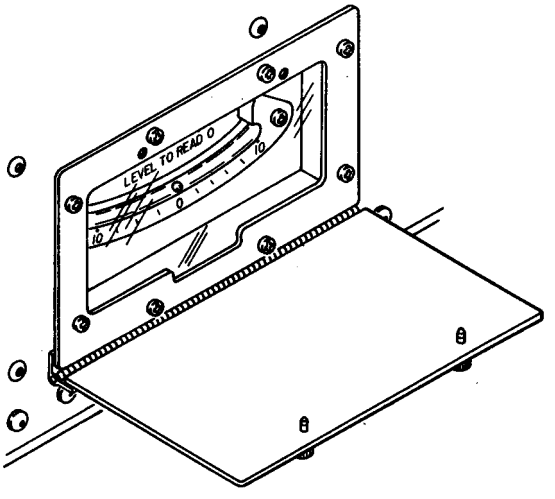
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		VAN BODY	
1		Inspect Exterior.	
	B/W	1. Inspect surfaces for punctures, cracks, or open seams that could permit moisture to enter wall.	Punctures, cracks, or open seams are present.
			
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

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

B - Before	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:
		VAN BODY - Cont	
1		Inspect Exterior - Cent	
		WARNING To prevent death or serious injury, do not handle or clean power cable or connectors when cable is connected to power source.	
	B	3. Inspect power cable assembly for dirt or damaged connectors. a. Wipe cable insulation with clean, dry cloth to remove dirt. b. Clean corrosion from terminals.	Connector damaged.

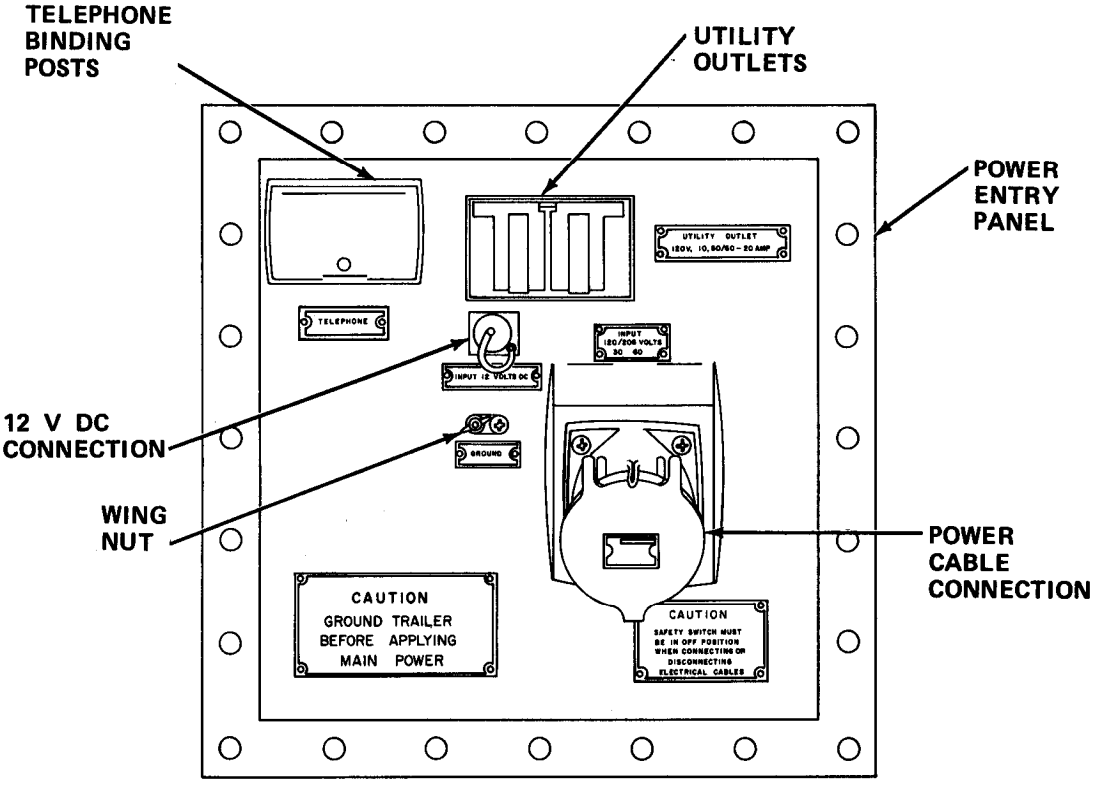


Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

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

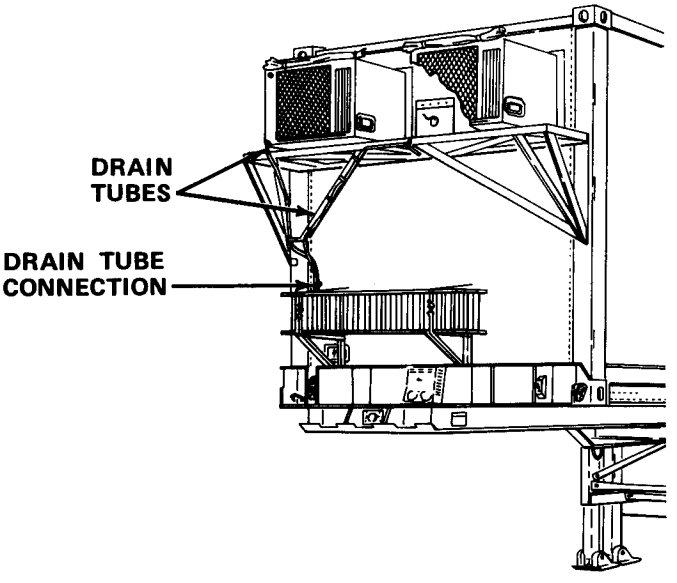


Table 1-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

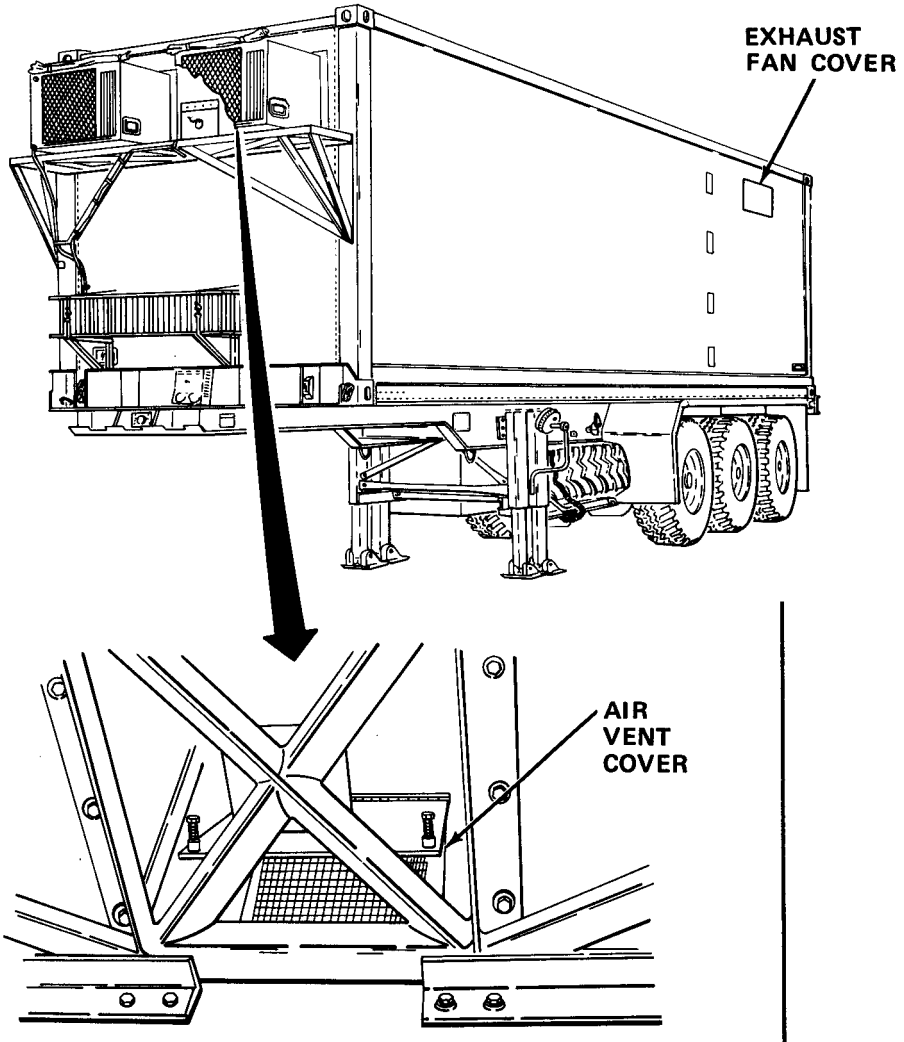
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		VAN BODY - Cont	
1		Inspect Exterior - Cont	
			
	B/W	7. Inspect exhaust fan cover and air vent cover to be sure they are not blocked or clogged. Clean as required. Clean screen with vacuum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

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

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

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

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

B—Before 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
		VAN BODY—Cont.	
1		Inspect Exterior-Cont.	
	B/D /A	10. Inspect front and rear van body locks to be sure locks are fully engaged.	Lock disengaged.
	Q	11. Inspect gaskets on personnel doors for leaks or damage.	
	W	11.1 Inspect hinges for proper placement of hinge pins.	Missing binge pins.
	Q	12. Clean and paint blistered, pitted, or flaking areas and bare metal spots in accordance with instructions contained in TM 43-0139, Painting Instructions for Field Use.	
2		Inspect Interior.	
	B/D	1. Test emergency lights by pressing test button.	Emergency lights do not light.
	W	2. Inspect power cords and cables to be sure wires are not kinked, cut, or cracked.	Wires or cables are cracked or cut.
	W	3. Inspect plug connectors to be sure all plug connectors are tight and firmly seated. Tighten if necessary.	
	D	4. Inspect for burned out light bulbs and fluorescent lamps. Replace as required.	
	W	5. Inspect walls, ceiling, and floor for holes, open seams, or signs of seepage or leaks.	Leaks are present.
	D	6. Check storage cabinets for broken hinges, latches, and locks.	Hinge, latch, or lock is broken.

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

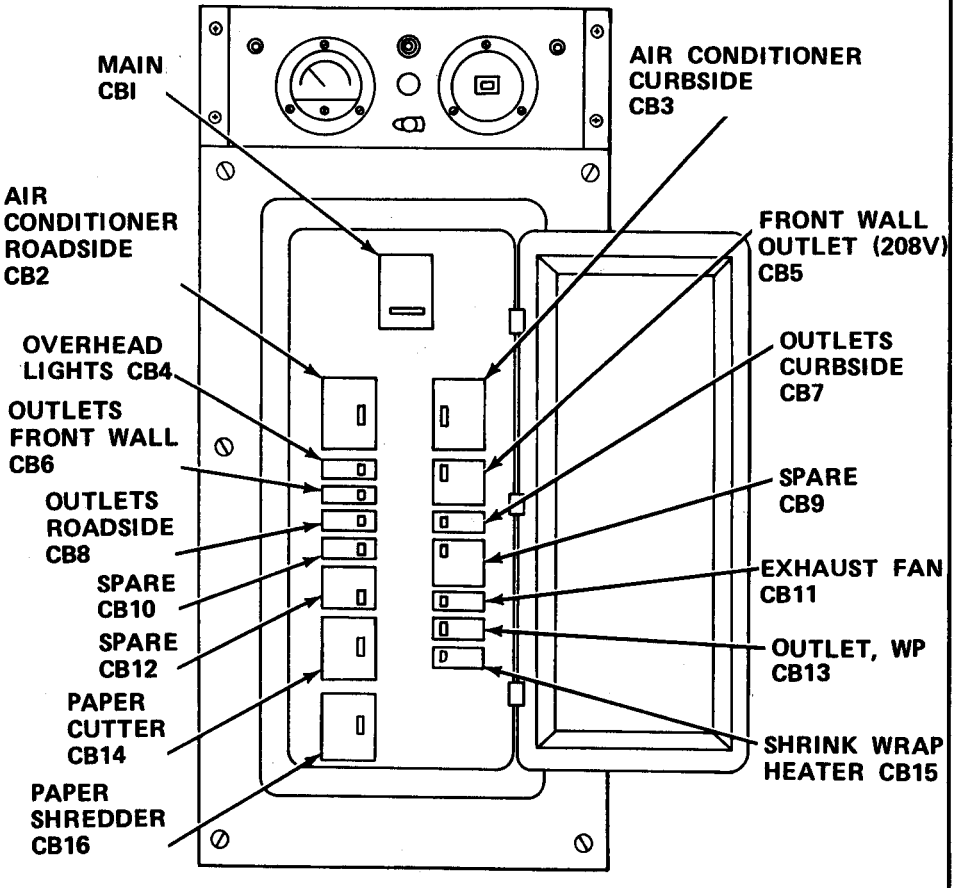
B - Before, D - During, A - After | W - Weekly, M - Monthly, Q - Quarterly | AN - Annually, S - Semiannually, BI - Biennially | (Number) - Hundreds of Hours

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

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

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

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



a. Set main circuit breaker to ON.

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

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

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

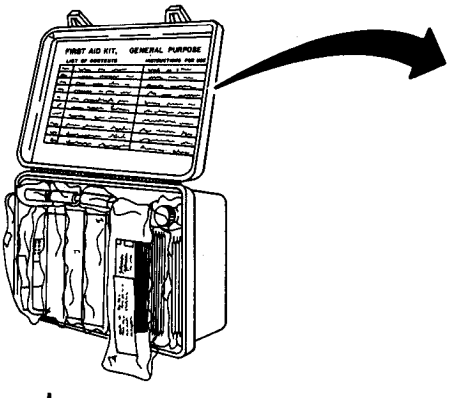
(Number) - Hundreds of Hours

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

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

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

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



FIRST AID KIT, GENERAL PURPOSE

LIST OF CONTENTS		INSTRUCTIONS FOR USE
3 ROLLS	ADHESIVE TAPE, SURGICAL, 1"X1½ YARDS	USE FOR MINOR CUTS AND CLOTHING REPAIR
16 EACH	BANDAGE, ADHESIVE, ¾"X3"	MINOR CUTS, AS REQUIRED
2 EACH	BANDAGE, GAUZE, COMPRESSED, CAMOUFLAGED, 3"X6 YARDS	CUT IN LENGTHS AS REQUIRED FOR BANDAGE INJURIES
1 EACH	BANDAGE, MUSLIN, COMPRESSED, CAMOUFLAGED, 27X27X52 INCH	USE FOR SLING
1 PKG	BLADE, SURGICAL PREPARATION RAZOR, STRAIGHT, SINGLE EDGE, 5s	SHAVING HAIR AND OPENING WOUNDS AS REQUIRED
1 PKG	COMPRESS AND BANDAGE, CAMOUFLAGED, 3"X3", 4s	FOR WOUNDS
3 EACH	DRESSING, FIRST AID, FIELD, 4X7 INCHES	FOR LARGE WOUNDS, EXCESSIVE BLEEDING
1 EACH	FIRST AID KIT, EYE DRESSING	FOR EYE WOUNDS, SEE INSTRUCTIONS
1 PKG	GAUZE, PETROLATUM, 3"X36", 2s	FOR BURNS, APPLY PAD OVER BURN
1 BTL	POVIDONE, IODINE SOLUTION, ½ OUNCE	AS DISINFECTANT AND CLEANSER OF CUTS AND WOUNDS, APPLY BEFORE BANDAGING
1 EACH	AMMONIA INHALANTS	CRUSH INHALANT BETWEEN FINGERS. HOLD A FEW INCHES FROM NOSE. HOLD CLOSER AS AMMONIA GETS WEAKER. WHEN TOO WEAK, USE FRESH INHALANT.
1 EACH	INSTRUCTION BOOKLET AND FIRST AID EXPLANATIONS	

a. Remove first aid kit from bracket.

b. Remove contents.

c. Inspect container for damage.

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

e. Replace damaged or missing items.

f. Repack kit.

g. Reinstall kit.

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

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

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

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

1-6.1 Preparation for Use.

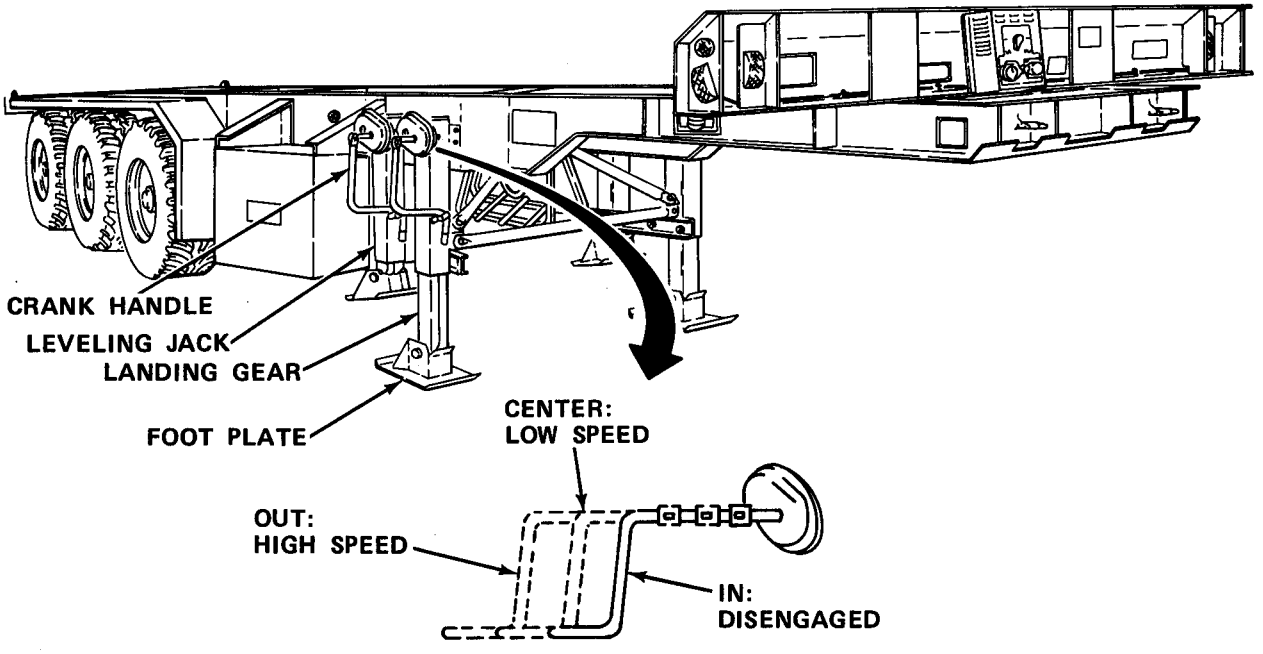
a. Procedures for leveling.

CAUTION

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

NOTE

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



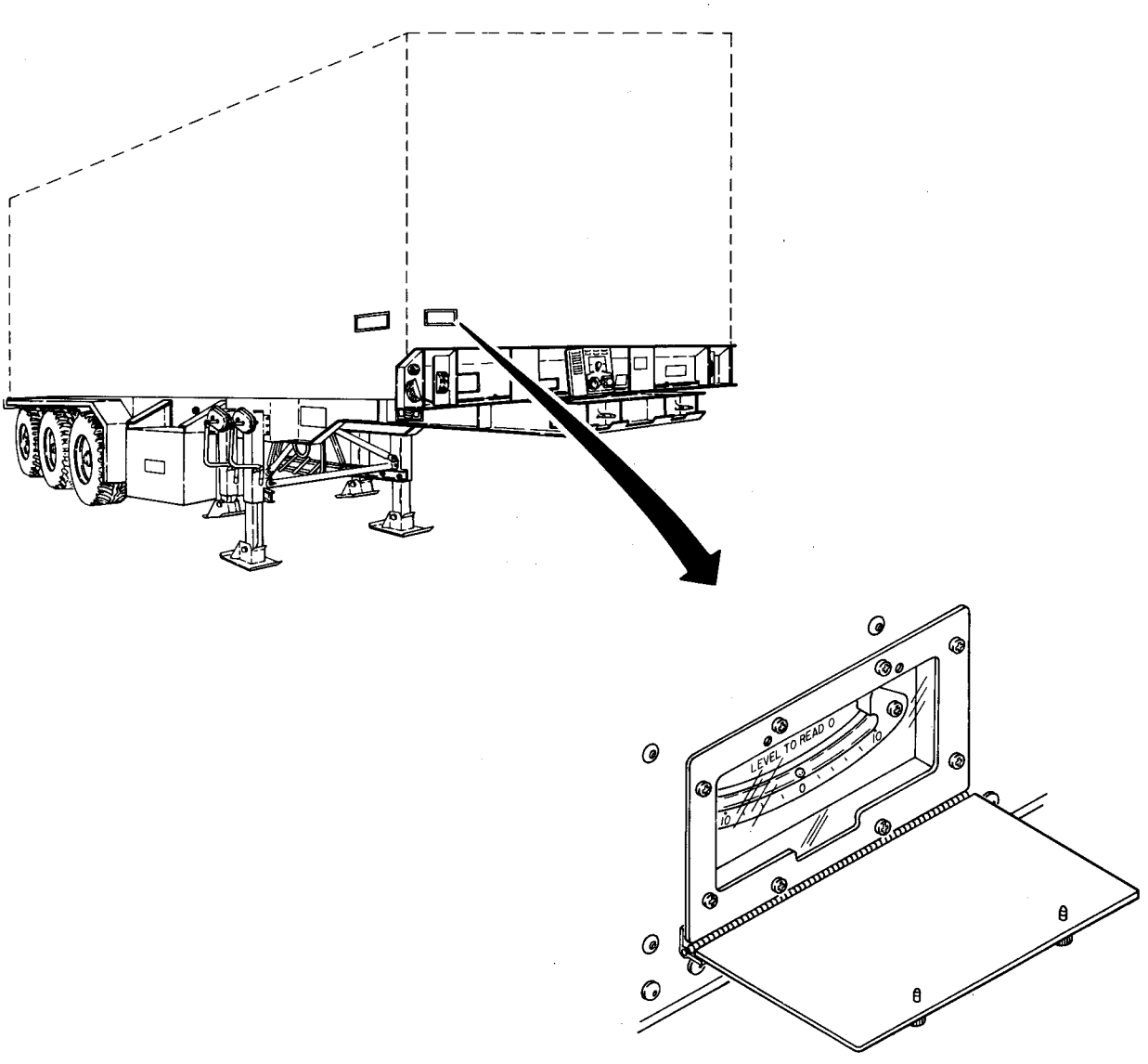
(1) Deflate air suspension in accordance with TM 5-2330-305-14.

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

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

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

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

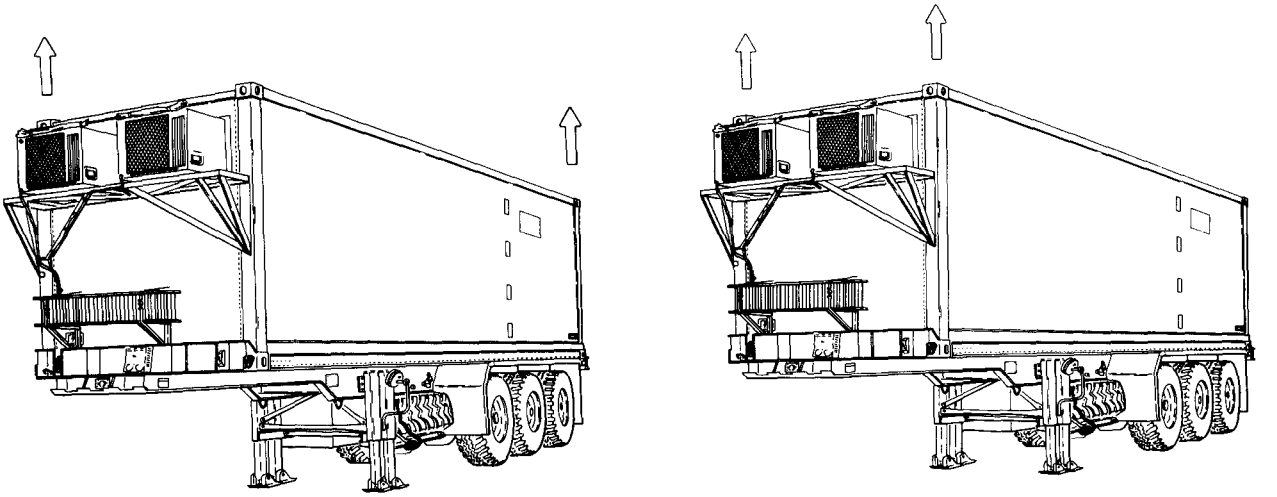


(6) Station personnel to have a clear view of level indicators at both front and rear of section.

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

CAUTION

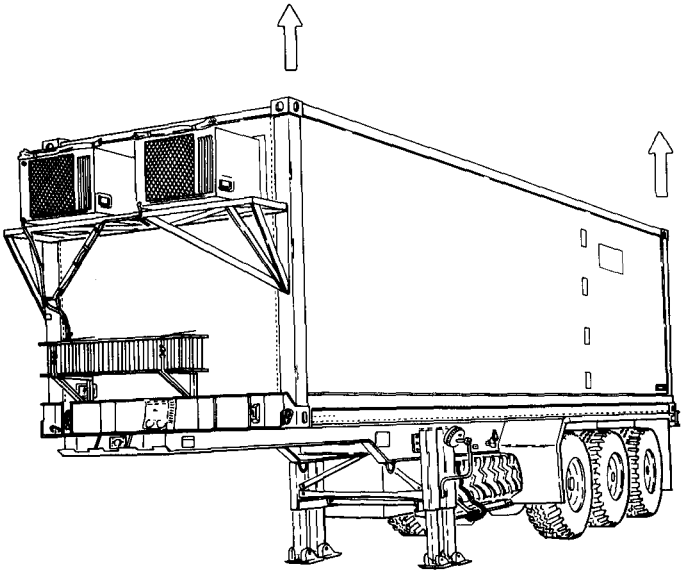
Do not attempt to level section by lifting at diagonal corners, or frame will be twisted.



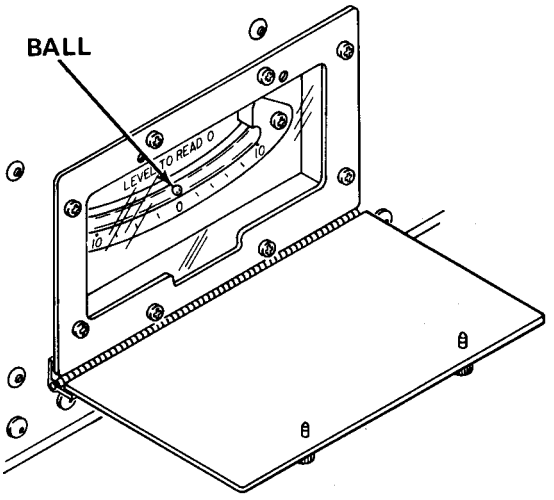
NO

YES

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



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

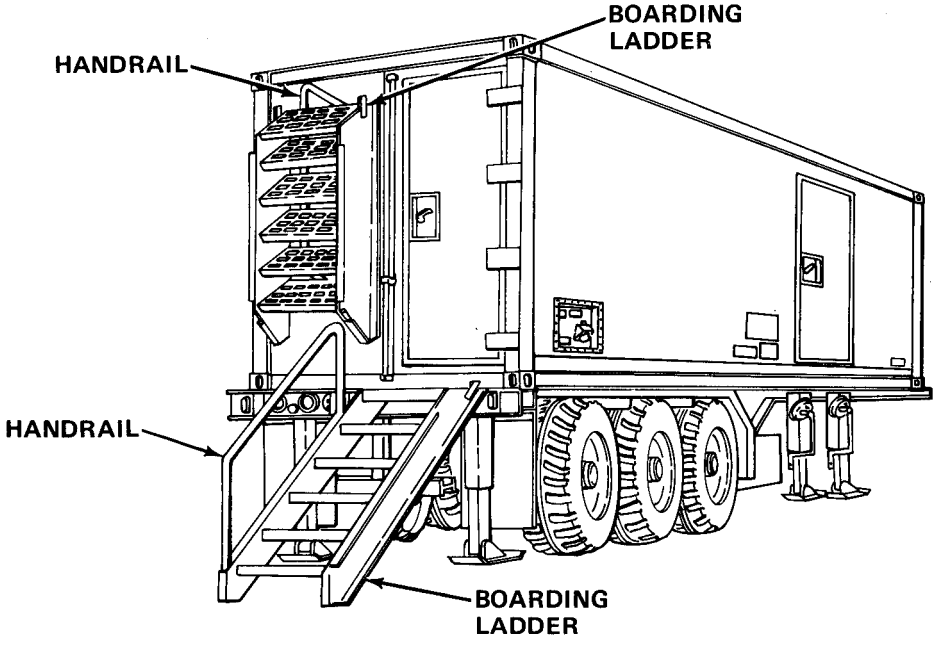


NOTE

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

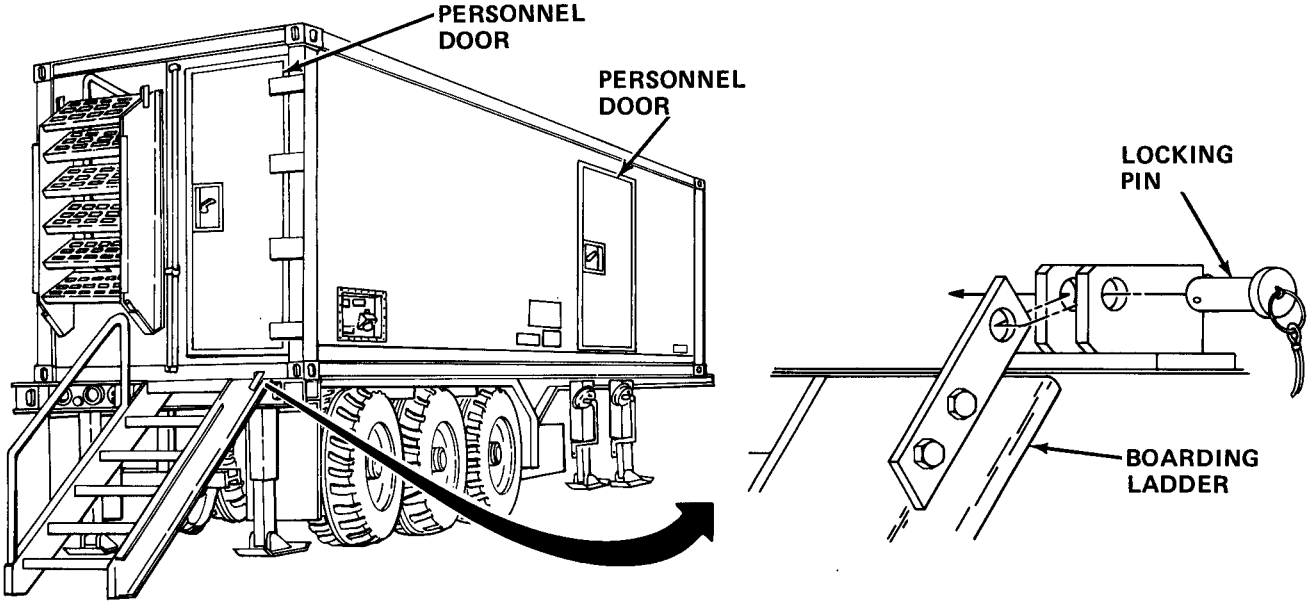
(10) Pull leveling crank handles away from trailer chassis, and lower crank handle to stowed position.

b. Procedures to activate section.

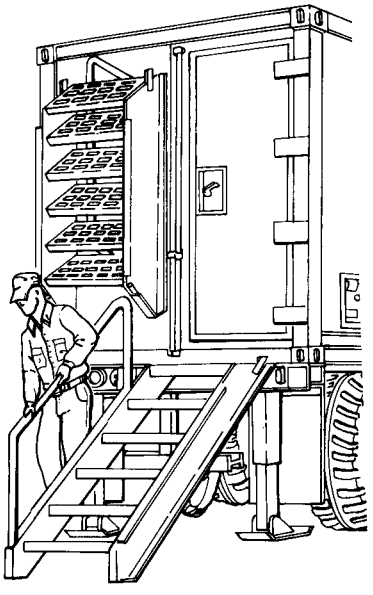


(1) Remove boarding ladders and handrails from rear of section.

(2) Remove handrails from ladders.



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

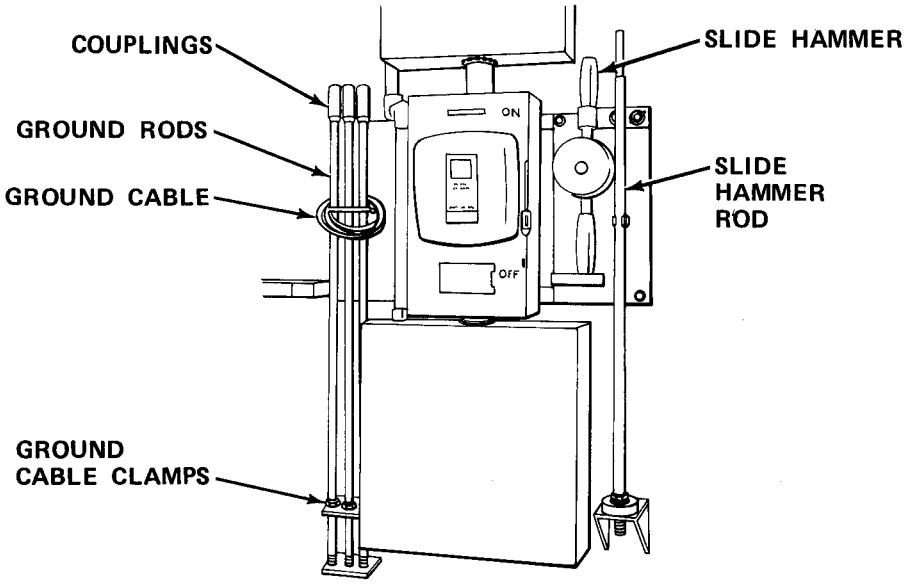


(4) Mount one handrail on each ladder.

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

WARNING

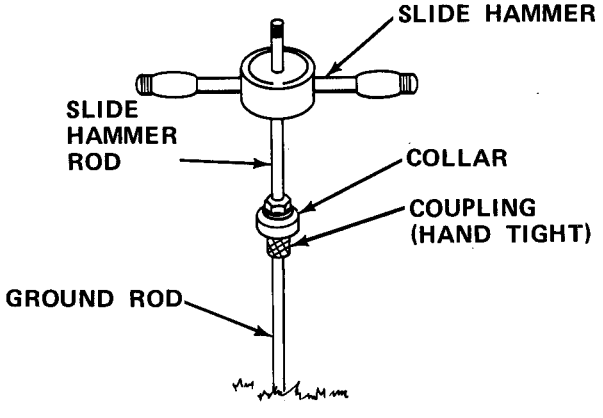
Death or serious injury may occur from connecting power cable to section before grounding.



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

NOTE

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



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

CAUTION

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

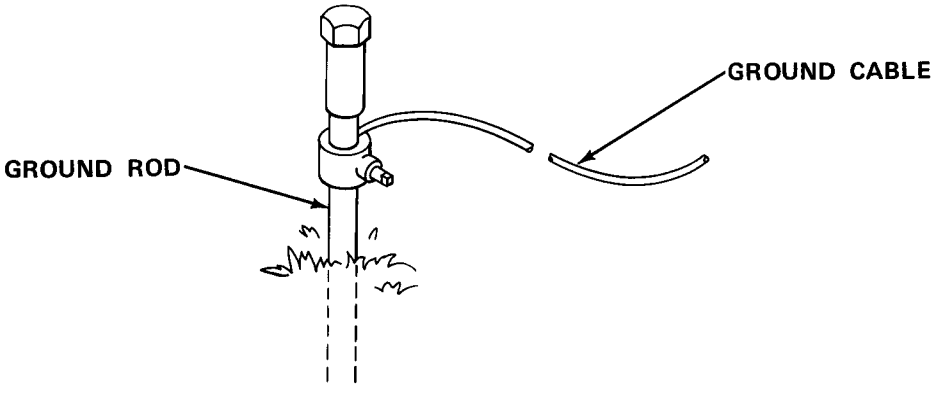
NOTE

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

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

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

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

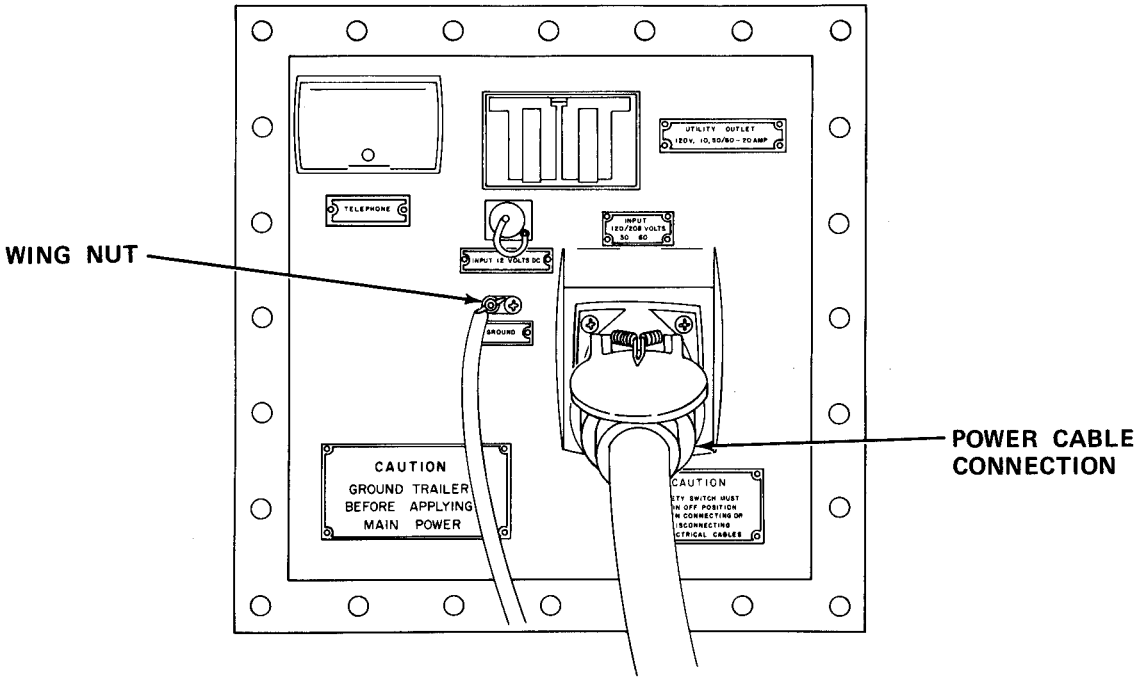


WARNING

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

NOTE

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



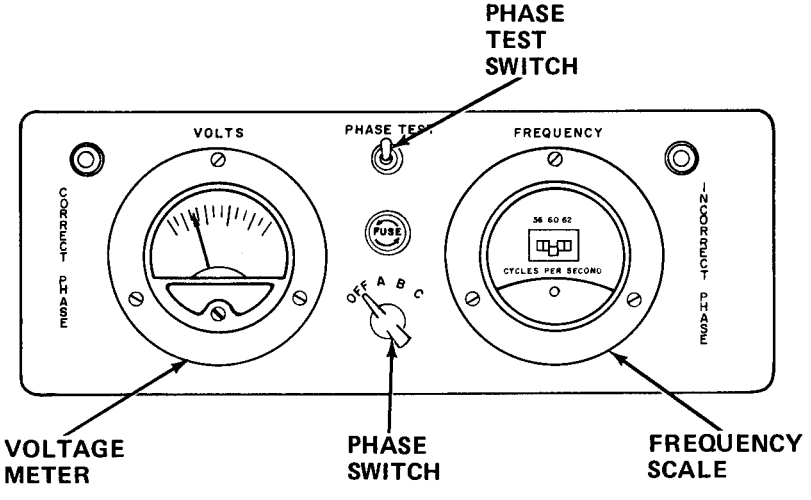
(11) Connect ground cable to ground lug with wing nut.

CAUTION

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

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

(13) Turn on safety switch.



CAUTION

Do not energizesection 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.

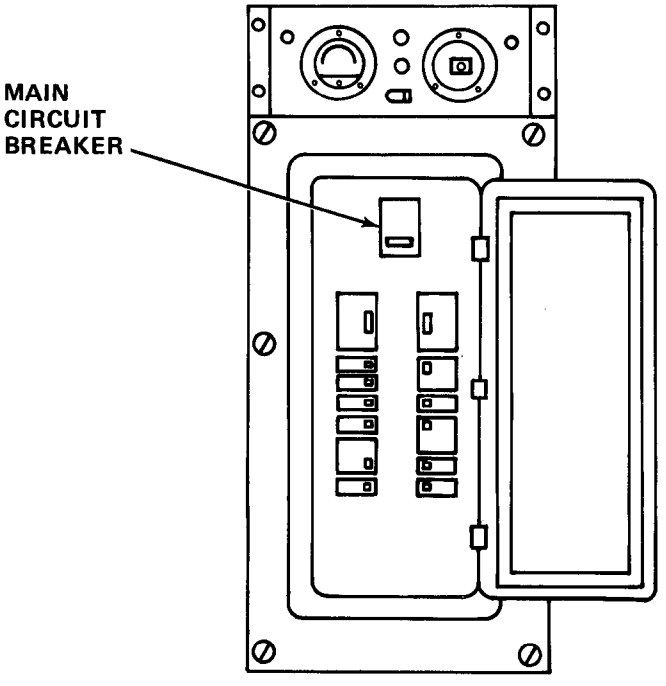
CAUTION

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 seal e.

(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.

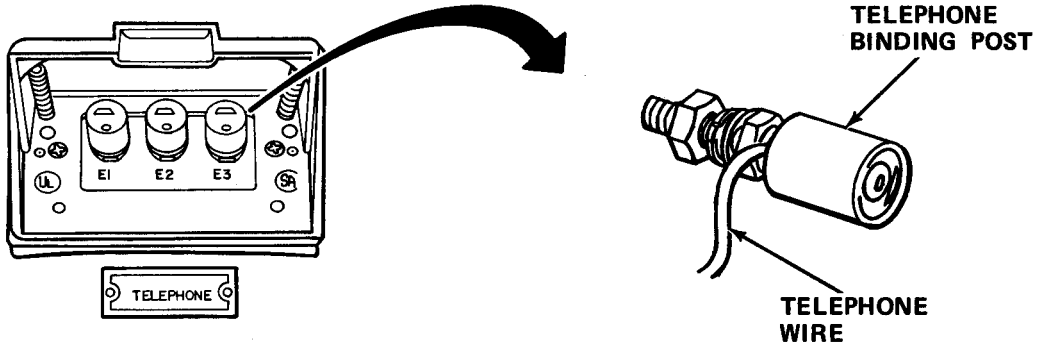
(16) Close blackout curtains, if required.

(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.

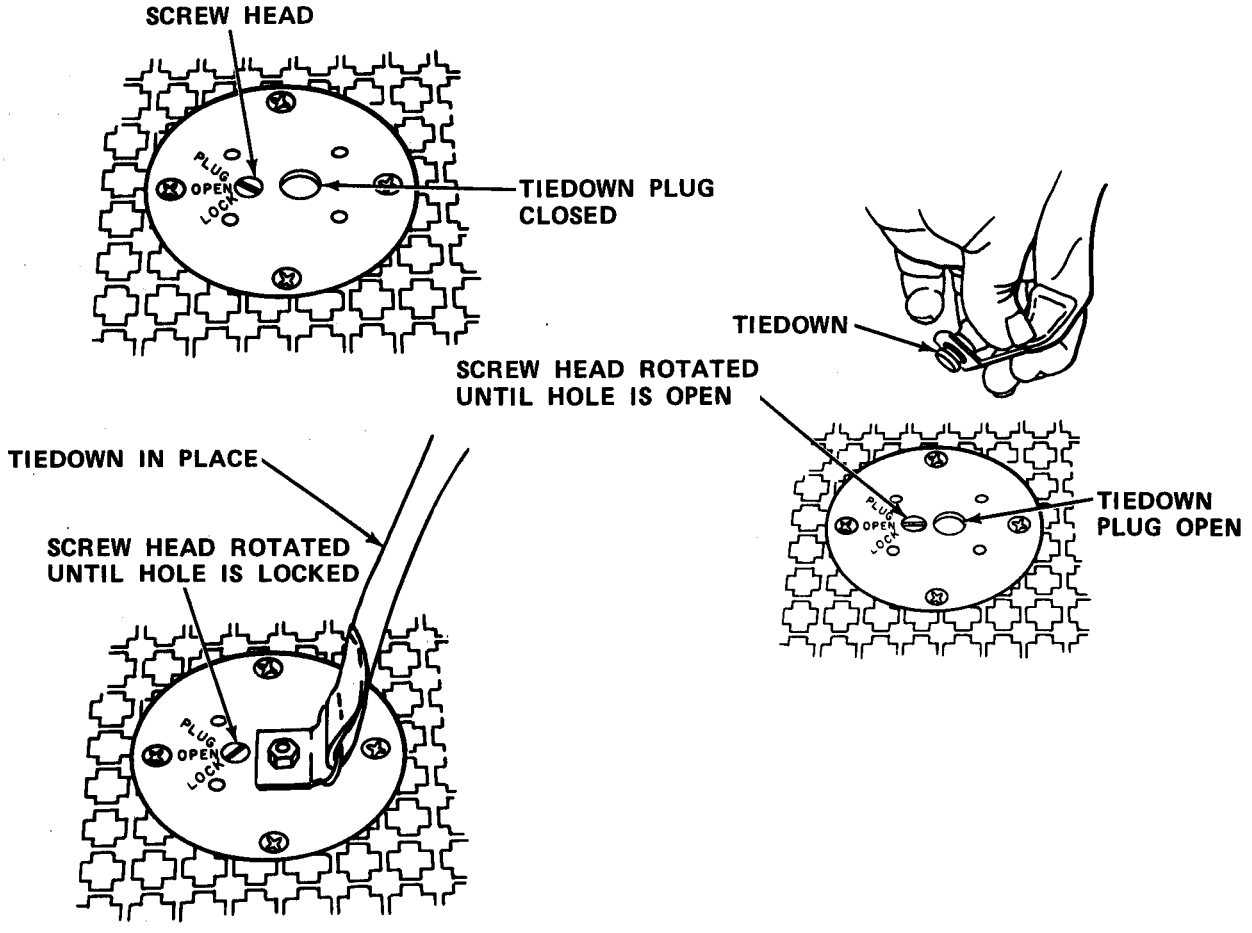
(19) Check blackout switches.

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

(21) Fully deflate air shocks until paper cutter rests on air shocks.

1-6.2 Preparation for Movement.

a. Inventory equipment and supplies.



b. Install tiedowns in tiedown sockets.

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

d. Secure straps and remove slack from tiedowns.

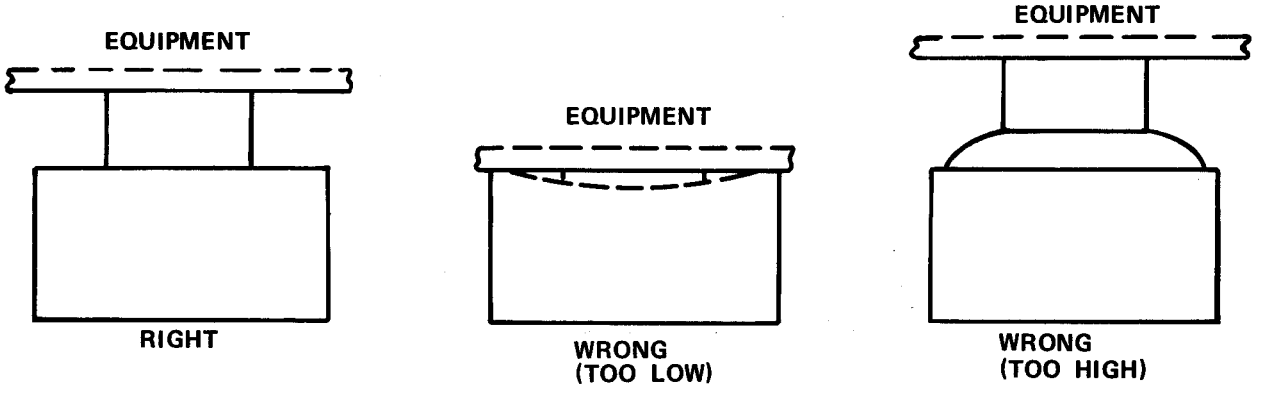
e. Inflate shock absorbers.

(1) Remove all valve caps.

CAUTION

To prevent damage to equipment or air shocks during transportation, inflate air shocks correctly. Do not exceed 90 psi (620 kPa) for the paper cutter.

(2) Connect air hose to valve.



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

(4) Reinstall valve caps.

WARNING

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

f. Turn equipment switches off.

g. Turn main circuit breaker off.

h. Turn safety switch off.

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

j. Turn emergency light switch off.

k. Disconnect telephone cables from power entry panel.

CAUTION

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

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

NOTE

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

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

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

NOTE

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

o. Remove handrails from boarding ladders.

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

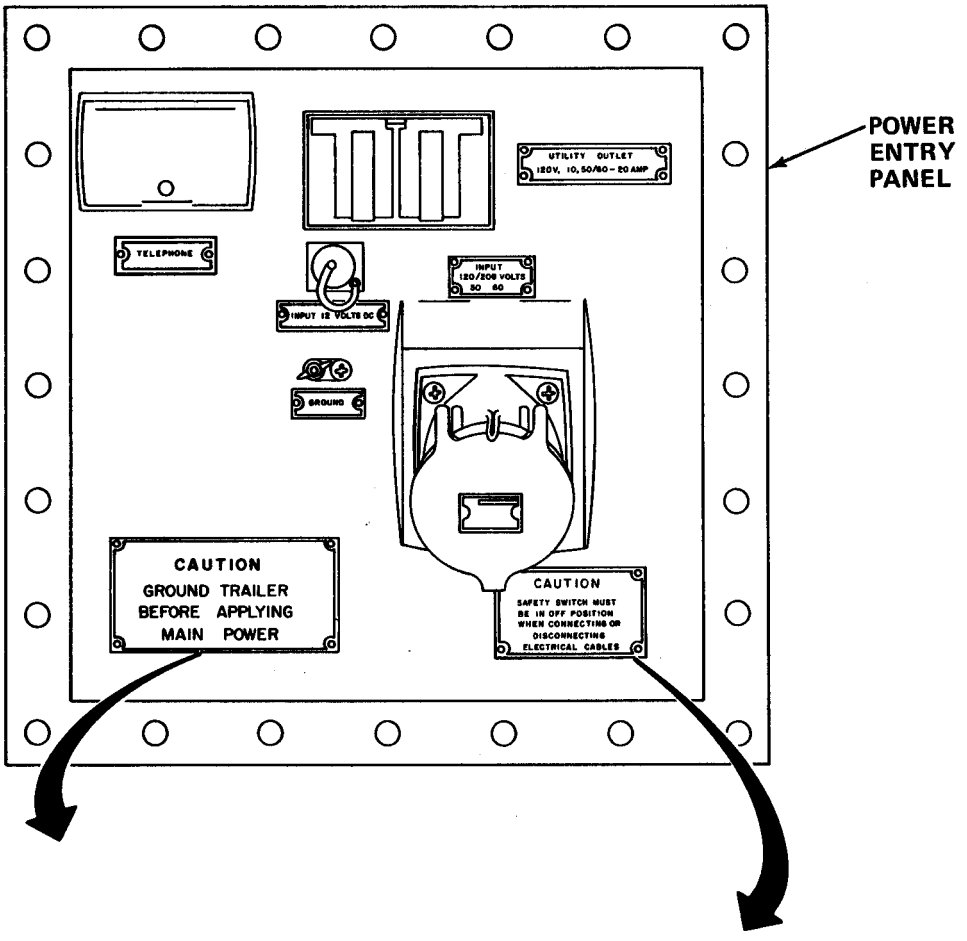
q. Secure ladders to back of section.

r. Fully extend landing gear.

s. Retract leveling jacks.

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

1-6.3 Operating Instructions on Decals and Instruction Plates.



CAUTION

GROUND TRAILER BEFORE APPLYING MAIN POWER

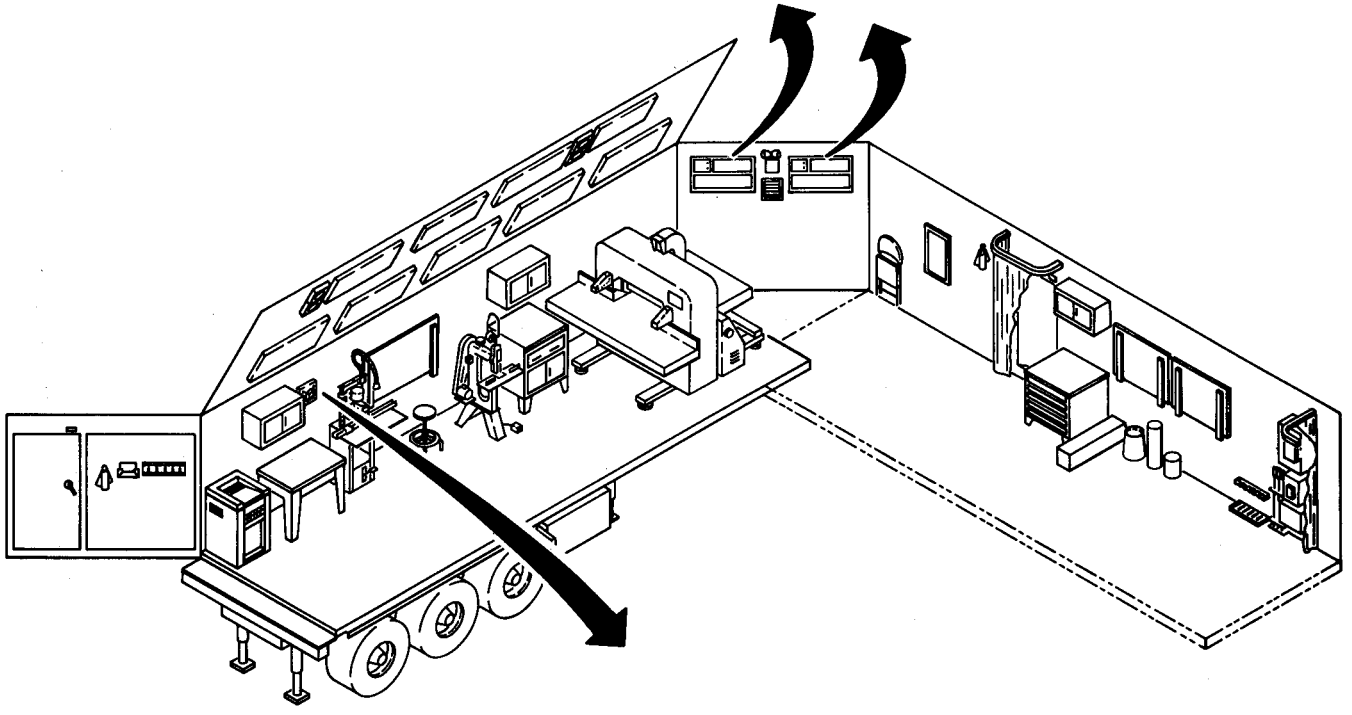
CAUTION

SAFETY SWITCH MUST BE IN OFF POSITION WHEN CONNECTING OR DISCONNECTING ELECTRICAL CABLES

CAUTION

FOR SAFE OPERATION
SEE TM FOR PROPER
INTERNAL AND EXTERNAL
GROUNDING

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



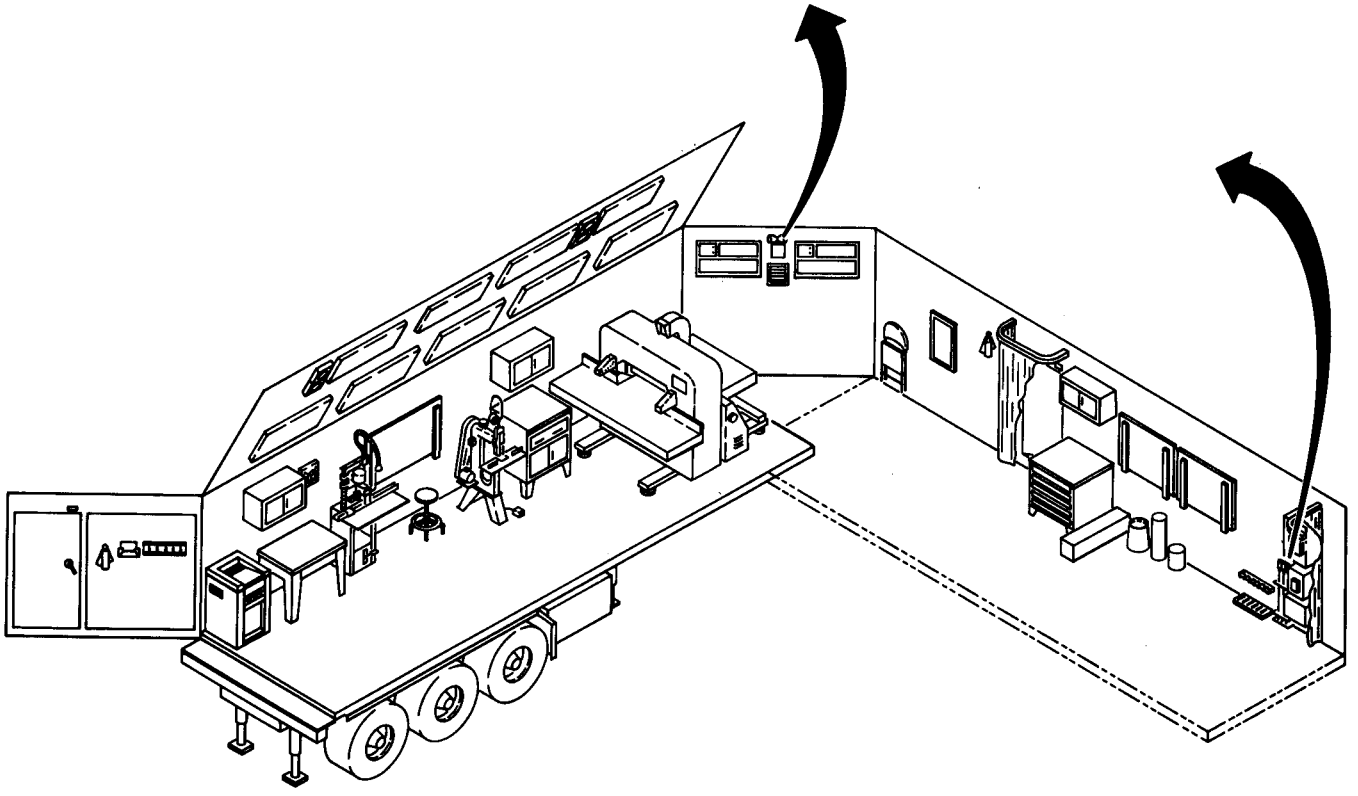
CAUTION

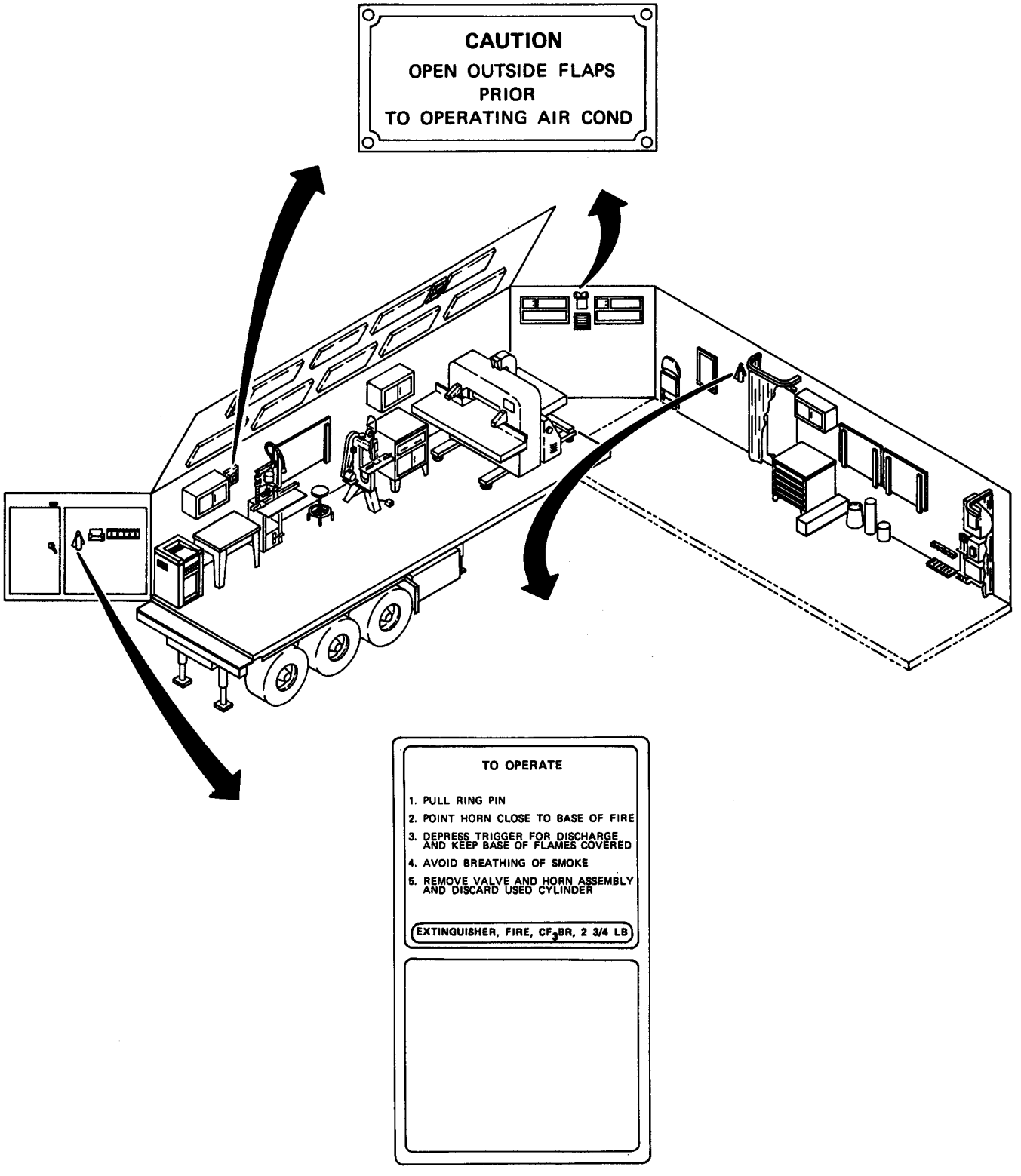
OPEN OUTSIDE VENT BEFORE
OPERATING FAN

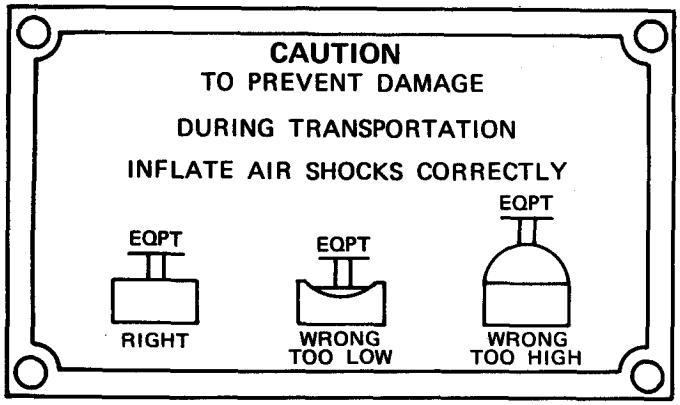
CAUTION

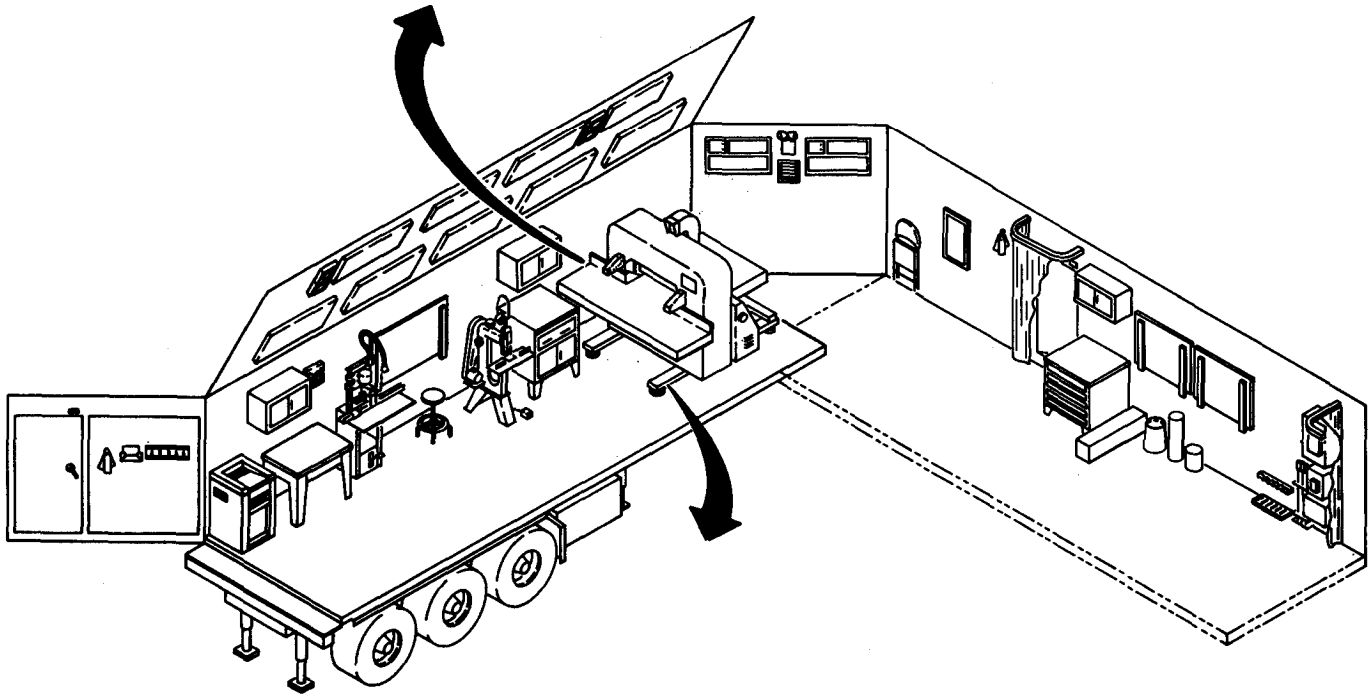
EMERGENCY LIGHT SWITCH
MUST BE IN THE OFF POSITION
WHEN ELECTRICAL POWER
IS INTENTIONALLY DISCONNECTED

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, CF_3BR, 2 3/4 LB





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

BARRY STABL-LEVL SLM-48
LOAD RATING: 1200 to 4800 PSI LBS.
MAX. INFLATION 90 P.S.I.

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

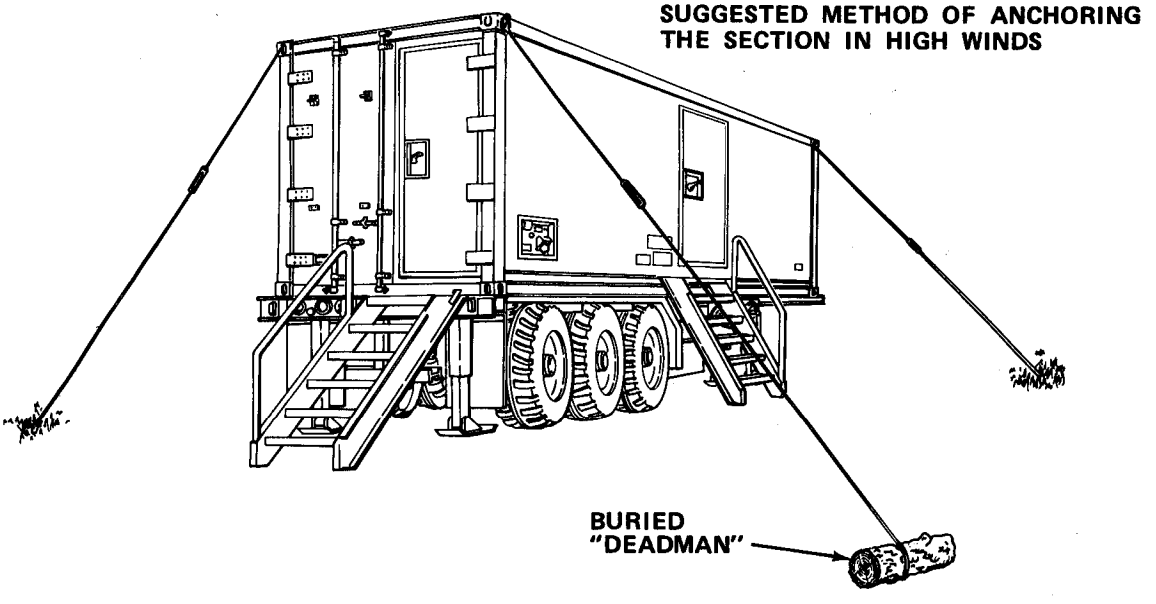
1-7. OPERATION UNDER UNUSUAL CONDITIONS.

NOTE

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

1-7.1 Operation in High Wind or Storm Conditions.

a. Relocate section if trees or structures present hazard.



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. When connecting or disconnecting cables, be careful 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.

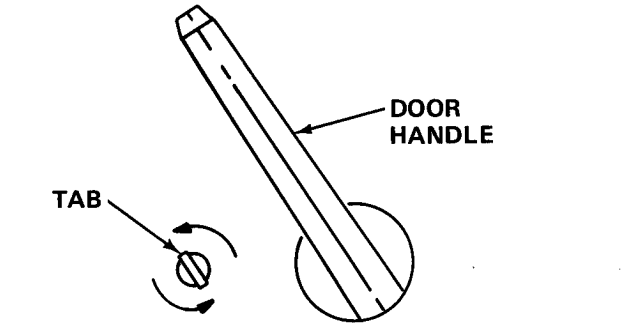
c. When section heaters are not operating or when the section is being transported, liquid consumable supplies may freeze, break their containers, then melt, and ruin equipment or documents. Store these items in an area to prevent equipment and document damage.

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

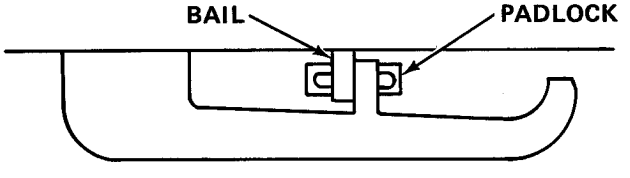
1-7.4 Operation in Tropical Conditions. Fungi, mildew, or mold will form on and in equipment, documents, and supplies if internal environmental control equipment is not operating and outside heat and humidity are allowed to enter the section.

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

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



INSIDE FRONT VIEW



OUTSIDE TOP VIEW

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 MAINTENANCE

1-8. LUBRICATION INSTRUCTIONS.

a. Lubrication instructions for the Finishing Section are contained in LO 5-3610-253-12, Lubrication Order, Finishing Section, Topographic Support System. The intervals and man-hours specified in the Lubrication Order are based on normal operations. During inactive periods, lubrication periods may be extended with adequate preservation.

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

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

1-9. TROUBLESHOOTING PROCEDURES.

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

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

Table 1-2. TROUBLESHOOTING

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

WARNING

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

Table 1-2. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
1. NO ELECTRICAL POWER TO SECTION - Cont	
Step 1. Observe voltage and frequency for phases A, B, and C. Read 115 ± 5 V,60 ± 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.
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.

Table 1-2. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

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.

3. BLACKOUT SWITCH DOES NOT OPERATE.

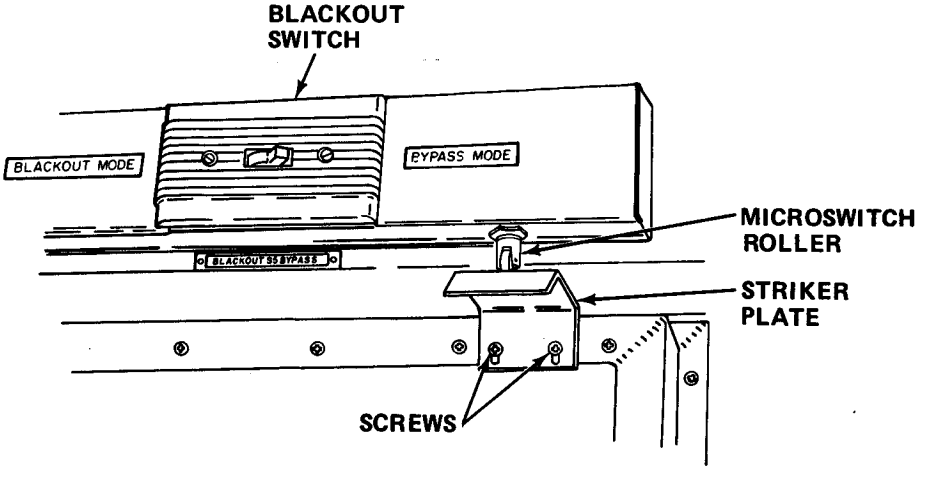


Table 1-2. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
3. BLACKOUT SWITCH DOES NOT OPERATE - Cent	
Step 1. Check blackout switch position.	
	(a) If switch is ON, proceed to step 2.
	(b) If switch is OFF, reset switch to BLACKOUT.
Step 2. Check to see that striker plate contacts roller on microswitch.	
	(a) Loosen screws and move plate up or down until microswitch operates.
	(b) If blackout switch still fails to operate, refer to organizational maintenance.

1-10. MAINTENANCE PROCEDURES.

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

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

INDEX

1-10.1 Replace Fluorescent Lamp.

MOS: 83F, Photolithographer

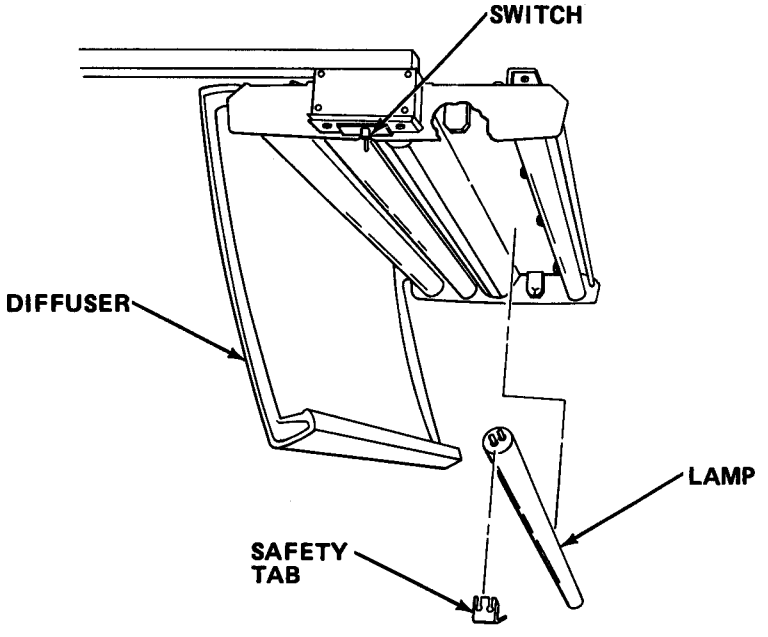
TOOLS: None

SUPPLIES: Fluorescent Lamp

WARNING

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

a. Turn switch OFF.



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

c. Remove safety tab from lamp socket.

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

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

f. Reinstall safety tab into lamp socket.

g. Reinstall diffuser.

h. Turn power ON.

1-10.2 Service Ventilation Ducts.

MOS: 83F, Photolithographer

TOOLS: Vacuum Cleaner
Flat Tip Screwdriver

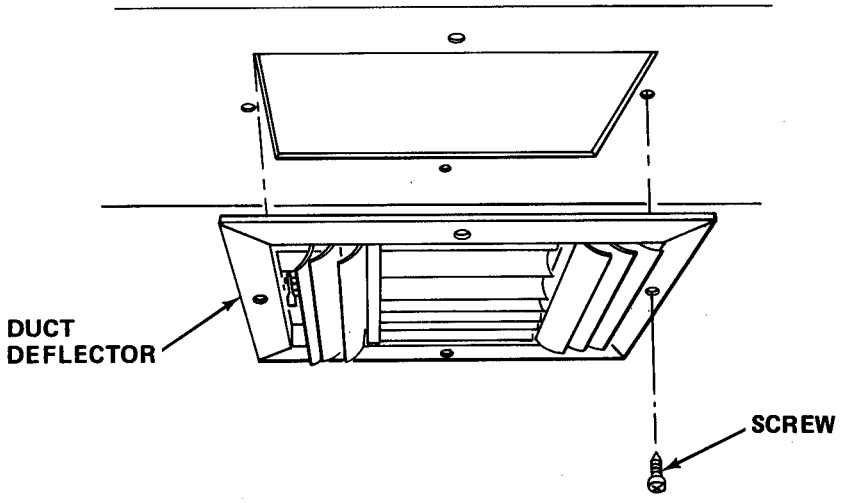
SUPPLIES: None

a. Cover equipment to prevent dust from entering equipment.

b. Close all doors and cabinets.

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

d. Turn off air conditioner/heater.



e. Remove four screws from each ventilation duct deflector.

f. Remove all duct deflectors.

g. Vacuum dirt or dust from deflector louvers.

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

i. Reinstall deflectors and secure with four screws.

j. Turn on air conditioner/heater.

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

l. Remove covers for operation.

1-10.3 Replace Blackout/Dome Light.

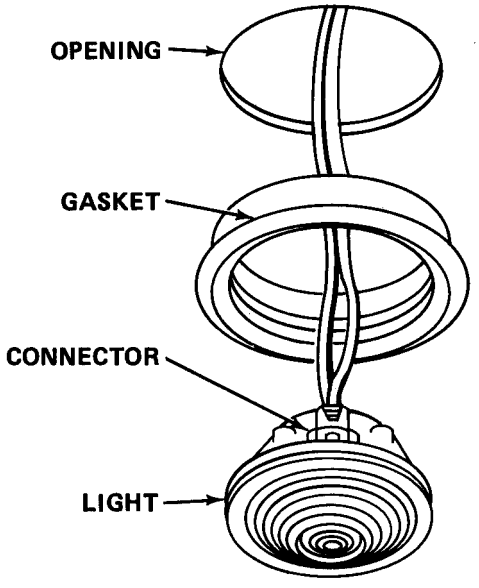
MOS: 83F, Photolithographer

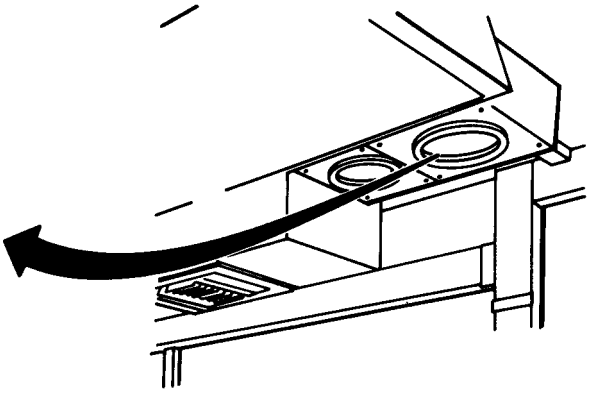
TOOLS: None

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

NOTE

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





a. Push light and gasket up into opening.

b. Tilt and remove light and gasket from opening.

c. Disconnect defective light from connector.

d. Connect new light to connector.

e. Reinstall gasket in opening.

NOTE

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

f. Position light in gasket and push in.

Section IV ORGANIZATIONAL MAINTENANCE

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

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

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

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

1-12.3 Repair Parts. Repair parts for this equipment are listed in the Repair Parts and Special Tools List, TM 5-361O-253-24P 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 DD Form 6, Packing Improvement Report.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Item	Quantity
Padlock	1 ea
Flashlight	1 ea

Table 1-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

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

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

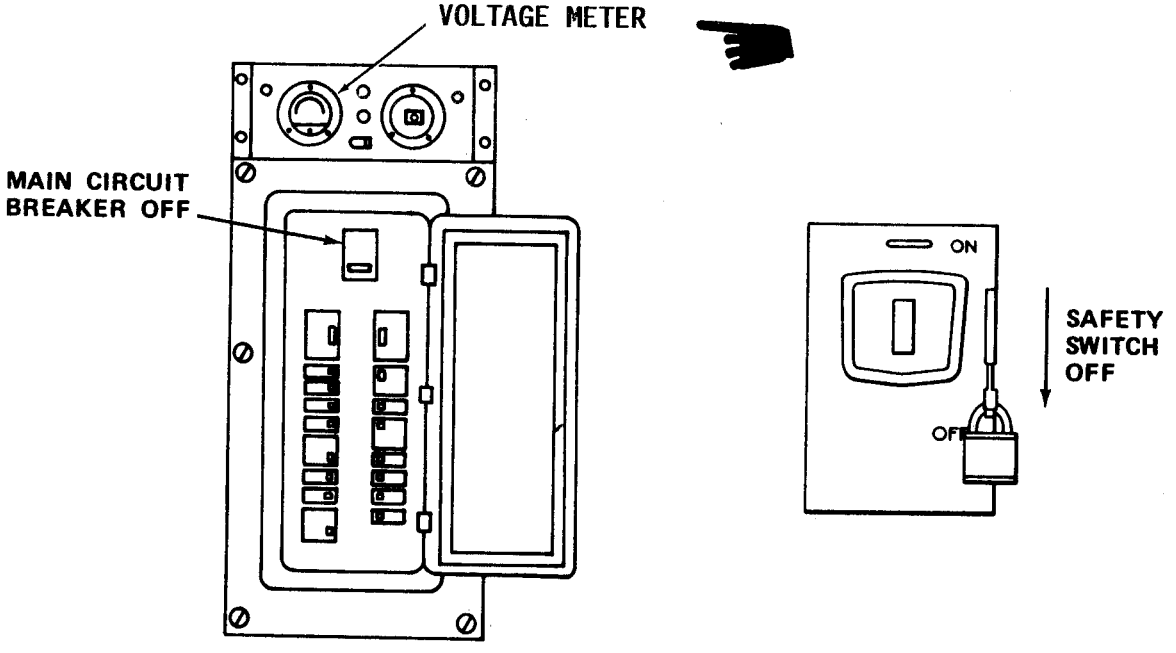


Table 1-3. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		VAN BODY - Cont
2	M	Service Lighting System - Cont

WARNING

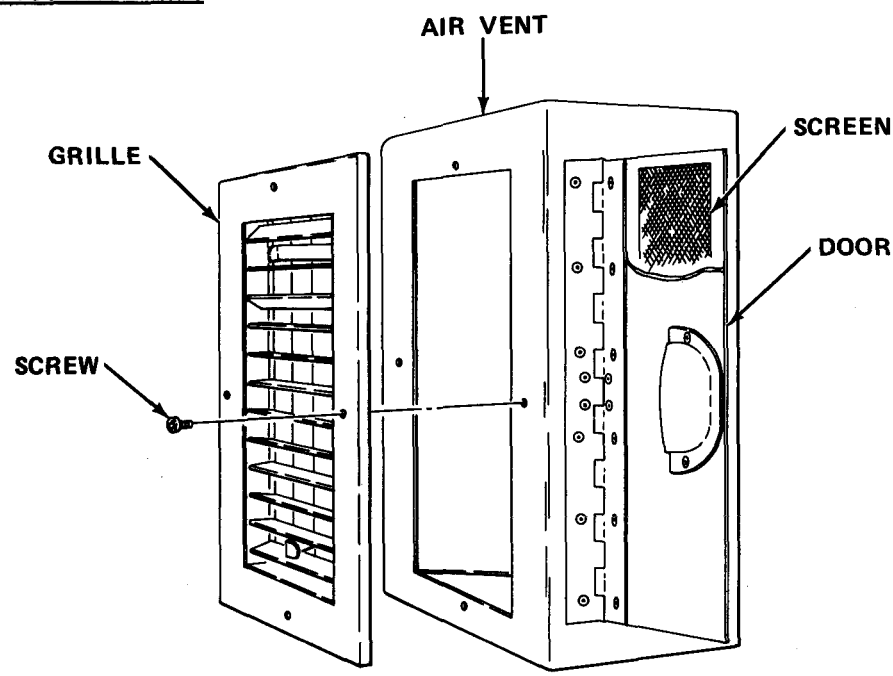
Do not open circuit breaker panel or service electrical connections. cables. or switches until main power is off, and voltage meter confirms circuit is not energized. Death may result from failure to observe these safety precautions.

1. Turn off main circuit breaker. Turn off safety switch.
2. Padlock safety switch.
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 panels, and conduits.
6. Remove padlock.
7. Turn on main circuit breaker and safety switch.

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

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

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		VAN BODY - Cont
3	M	Service Air Vent



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

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

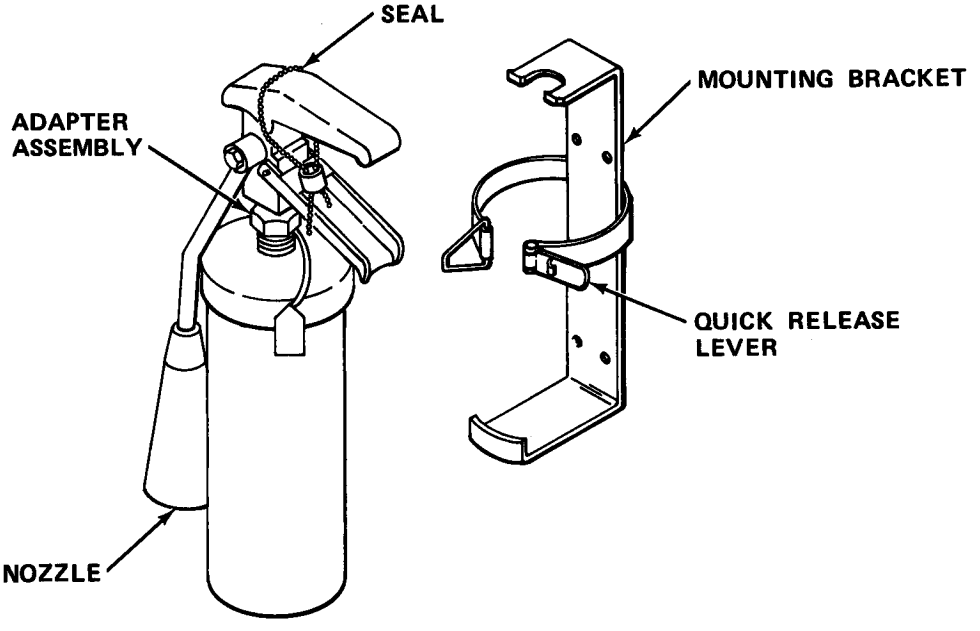
B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
s - Semiannually
Bl - Biennially

(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		VAN BODY - Cont
4	M	Inspect Fire Extinguisher.
		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.
	S	4. Weigh cylinder. Replace if gross weight has decreased by 6 oz (170 g) or more.



1-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES.

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

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

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

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

Table 1-4. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

WARNING

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

1. FLUORESCENT CEILING LAMP IS INOPERATIVE.

Step 1. Check for continuity of fluorescent lamp switch.

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

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

Step 2. Check for continuity of lamp ballast.

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

(b) If continuity does not exist, replace lamp 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).

3. EMERGENCY LIGHTS ARE INOPERATIVE.

Press in test indicator.

If lamps do not light, replace emergency light assembly (paragraph 1-16.11).

Table 1-4. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
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. MAINTENANCE PROCEDURES.

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

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

INDEX

1-16.1 Replace Fluorescent Lamp Ballast.

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

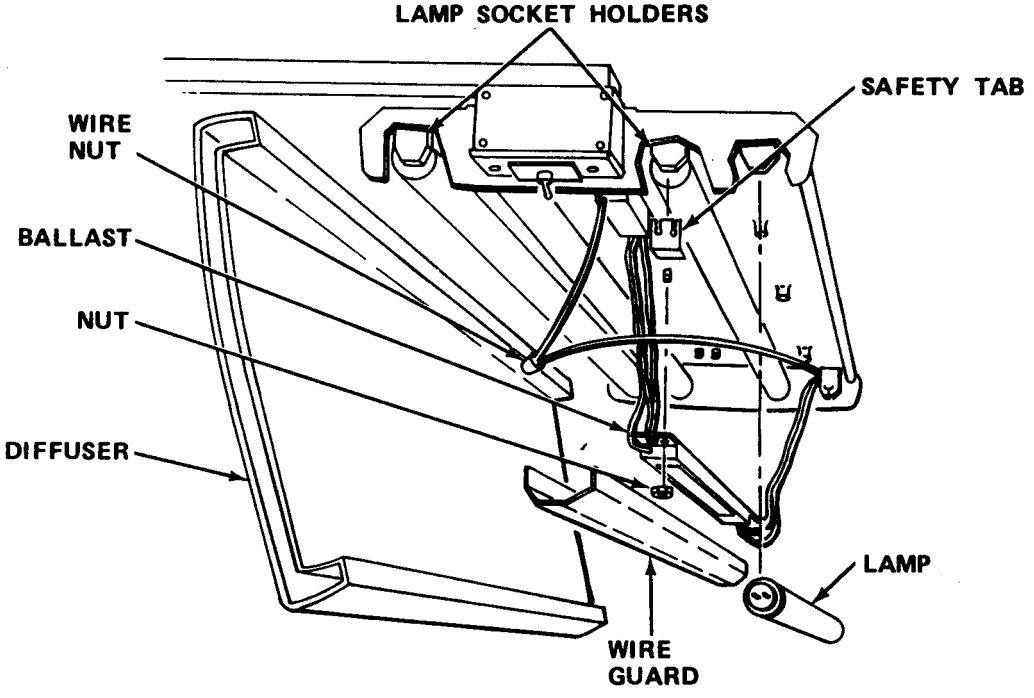
TOOLS: Flat Tip Screwdriver
1/4 in. Wrench
1/4 in. Drive Socket Set
Scribe

SUPPLIES: Lamp Ballast
Wire Ties

WARNING

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

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



b. Remove diffuser from light fixture.

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

d. Squeeze light wire guard and remove.

e. Remove wire ties as required.

f. Tag wires from ballast for reference.

g. Disconnect ballast wire from wire nut connection.

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

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

j. Remove nut and defective ballast.

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

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 lamp and safety tabs.

r. Reinstall diffuser.

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

1-16.2 Replace Radio Frequency (RF) Filter.

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

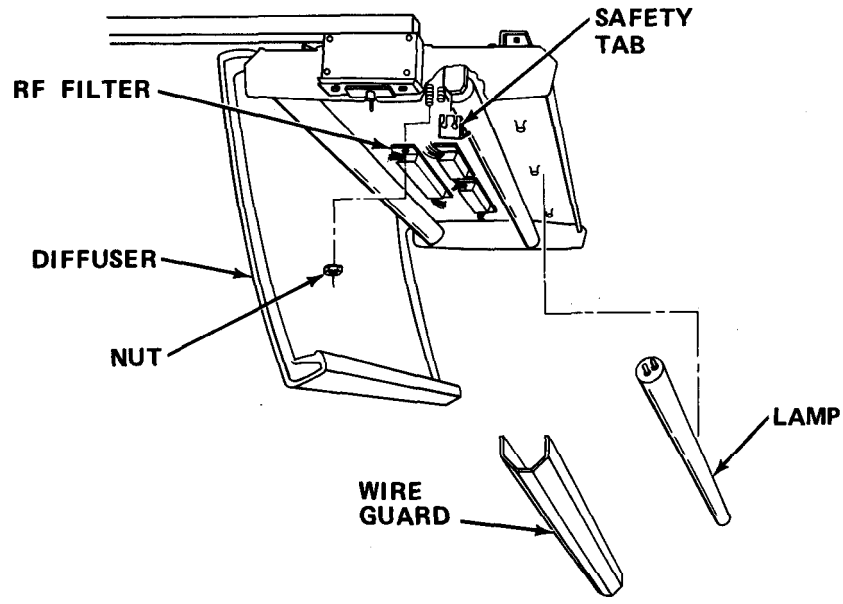
TOOLS: Flat Tip Screwdriver
1/4 in. Wrench
1/4 in. Drive Socket Set

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 and lamps. 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 and safety tabs.

o. Reinstall diffuser.

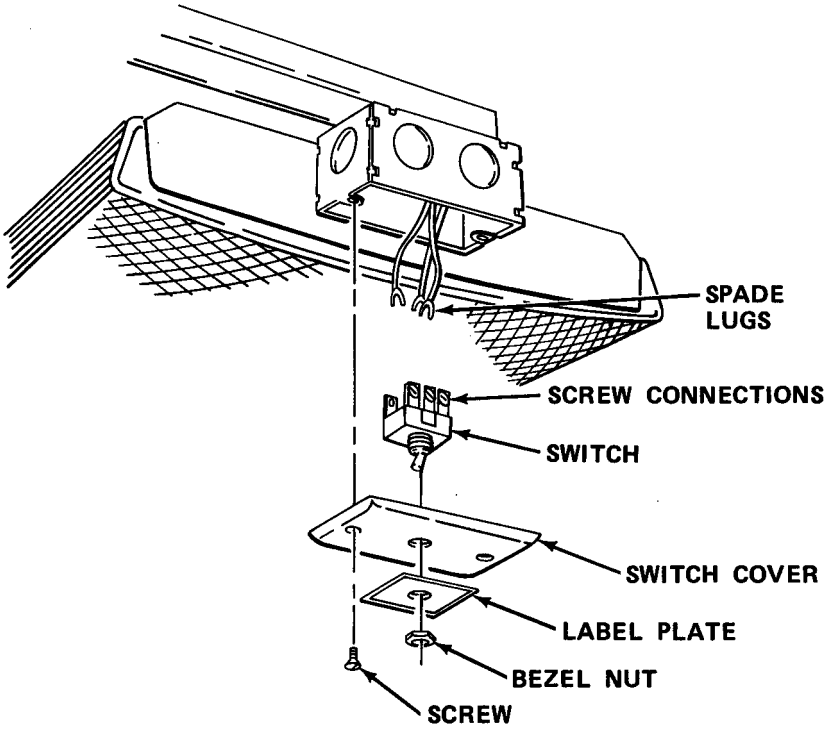
p. Turn on light switch.

1-16.3 Replace Fluorescent Lamp Switch.

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

TOOLS: Flat Tip Screwdriver
Needle Nose Pliers
Flashlight

SUPPLIES: Switch Assembly



WARNING

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

NOTE

Alternate lighting is required to perform this task.

a. Turn circuit breaker OFF.

b. Remove bezel nut.

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

d. Loosen screws.

NOTE

Note position of cover and reinstall as noted.

e. Remove cover plate.

f. Tag and disconnect wires from defective switch.

g. Install new switch and connect wires.

h. Insert switch through cover plate and label plate.

NOTE

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

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

j. Turn circuit breaker ON.

1-16.4 Replace On/Off Switch.

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

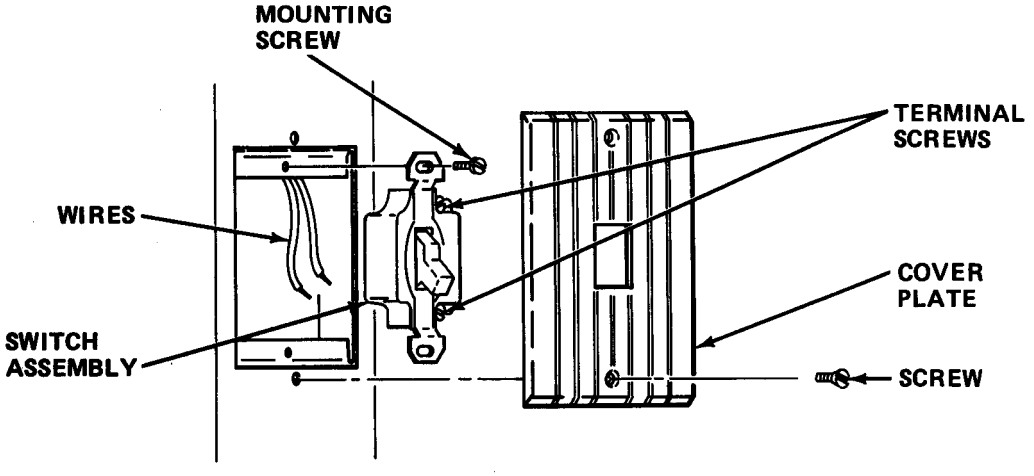
TOOLS: Flat Tip Screwdriver

SUPPLIES: Switch

WARNING

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

a. Turn off appropriate circuit breaker.



b. Remove screws.

c. Remove cover plate.

d. Remove mounting screws.

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

f. Loosen terminal screws; then disconnect wires.

g. Install new switch.

h. Reconnect wires.

i. Guide switch into wire guide, alining holes.

NOTE

Be sure wires are not kinked or strained.

j. Reinstall mounting screws.

k. Reinstall cover plate and secure with screws.

l. Turn on switch circuit breaker.

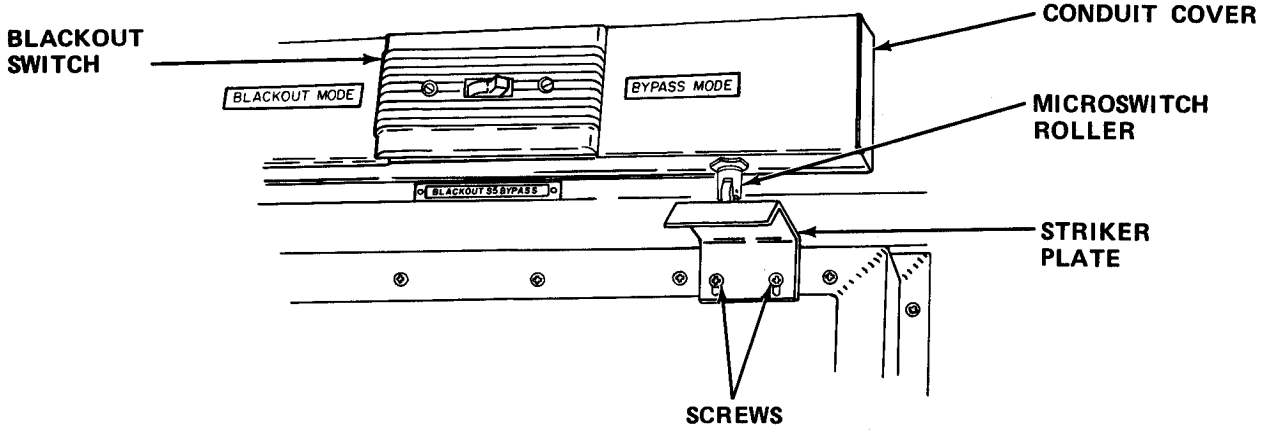
1-16.5 Replace Blackout/Dome Light Microswitch.

MOS: 83FJ6, Reproduction Equipment Repairer

41B, Topographic Instrument Repair Specialist

TOOLS: Flat Tip Screwdriver
6 in. Adjustable Wrench

SUPPLIES: Microswitch



WARNING

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

a. Turn off blackout/dome light circuit breaker.

b. Remove conduit cover.

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

d. Disconnect wires from defective switch.

e. Connect wires to new switch.

f. Install switch and secure with nut.

g. Adjust striker plate until plate contacts roller.

h. Reinstall conduit cover.

i. Turn on circuit breaker.

1-16.6 Replace Receptacle.

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

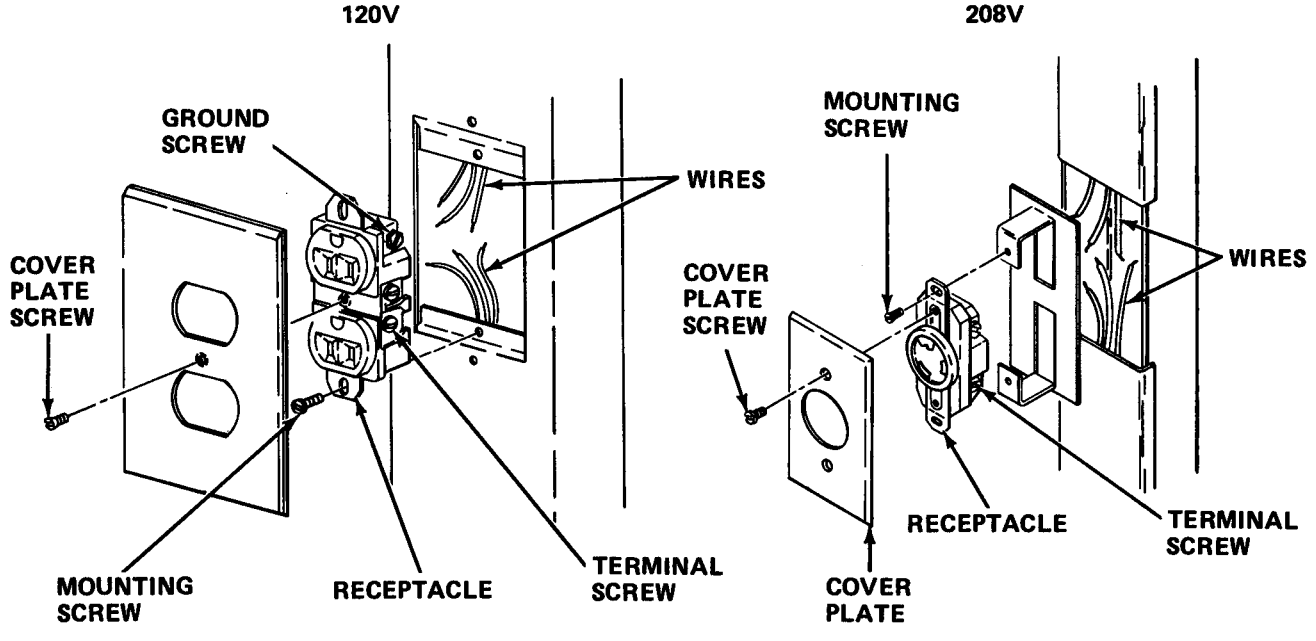
TOOLS: Flat Tip Screwdriver

SUPPLIES: Receptacle

WARNING

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

a. Turn off receptacle circuit breaker.



b. Remove cover plate screws.

c. Remove cover plate.

d. Remove mounting screws.

e. Withdraw receptacle to gain access to wires.

f. Loosen terminal screws and ground screw. Then disconnect wires.

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

h. Install new receptacle.

i. Guide receptacle into wire guide.

NOTE

Be sure wires are not kinked or strained.

j. Secure receptacle with screws.

k. Reinstall cover plate. Secure with screws.

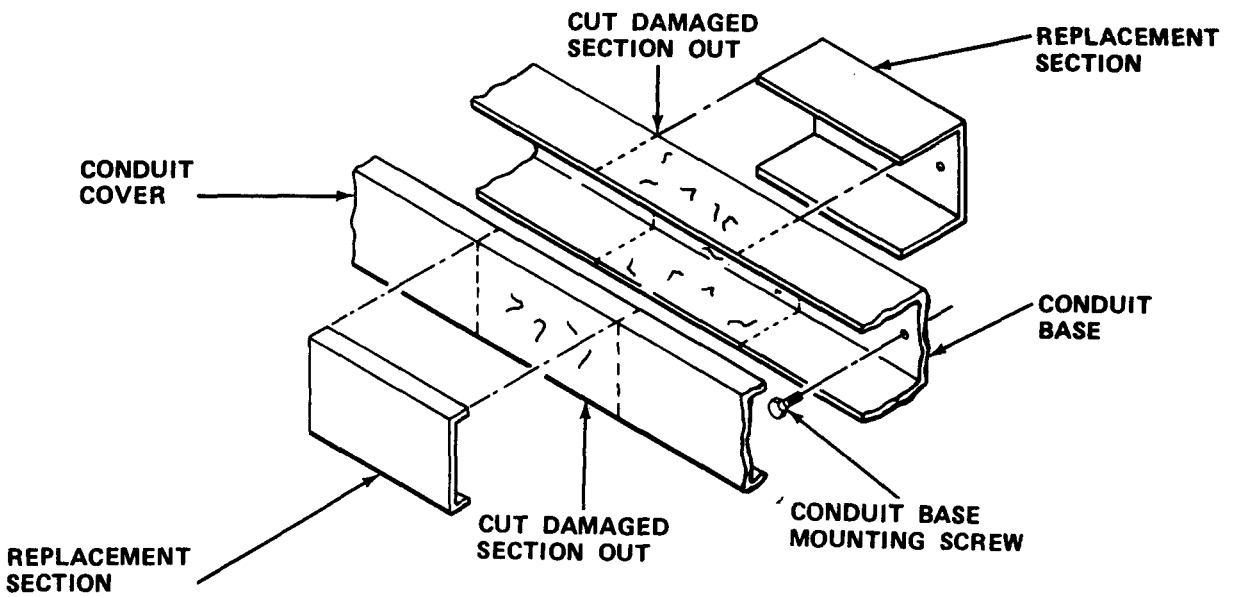
l. Turn on receptacle circuit breaker.

1-16.7 Replace Wire Molding.

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

TOOLS: Flat-Tip Screwdriver
Hacksaw
Flashlight
Deleted.
Paint Brush
Multimeter
Drill and Bits
File
Machinist Rule

SUPPLIES: Paint (Item 19, Appendix E)
Cheesecloth (Item 6, Appendix E)
Conduit Base
Conduit Cover
Padlock



WARNING

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

NOTE

Alternate lighting is required to perform this task.

a. Turn off and padlock safety switch.

1-16.9 Replace Exhaust Fan.

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

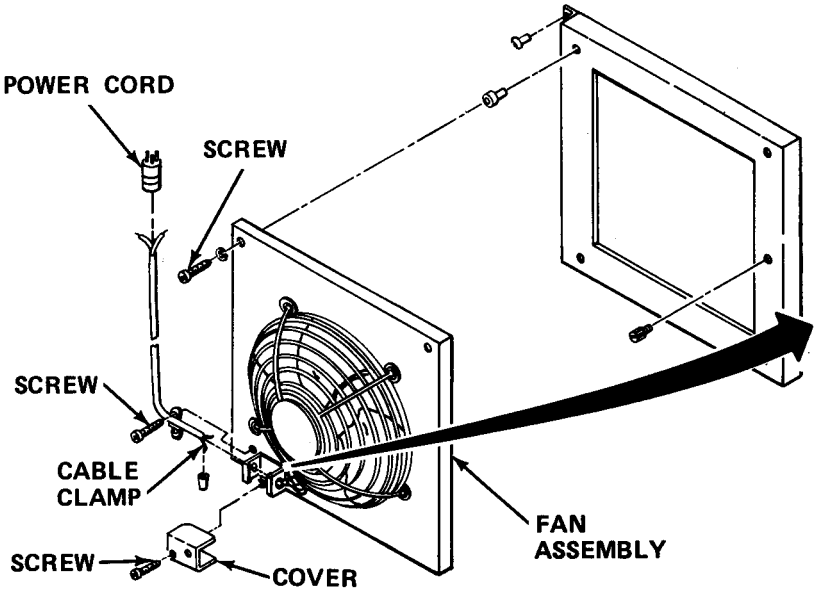
TOOLS: Flat Tip Screwdriver
Cross Tip Screwdriver
Wire Cutters

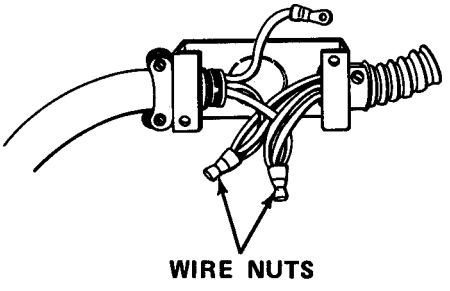
SUPPLIES: Fan Assembly
Wire Nuts
Power Cord

WARNING

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

a. Unplug power cord.





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

c. Loosen screws on cable clamp.

d. Remove screws and cover.

e. Tag wires and cut wire nuts from wires.

f. Remove power cord from defective fan assembly.

g. Install new fan.

h. Install new power cord.

i. Connect wires with wire nuts and remove tags.

j. Tighten cable clamp screws.

k. Reinstall cover. Secure with screws.

l. Reinstall fan assembly. Secure with screws.

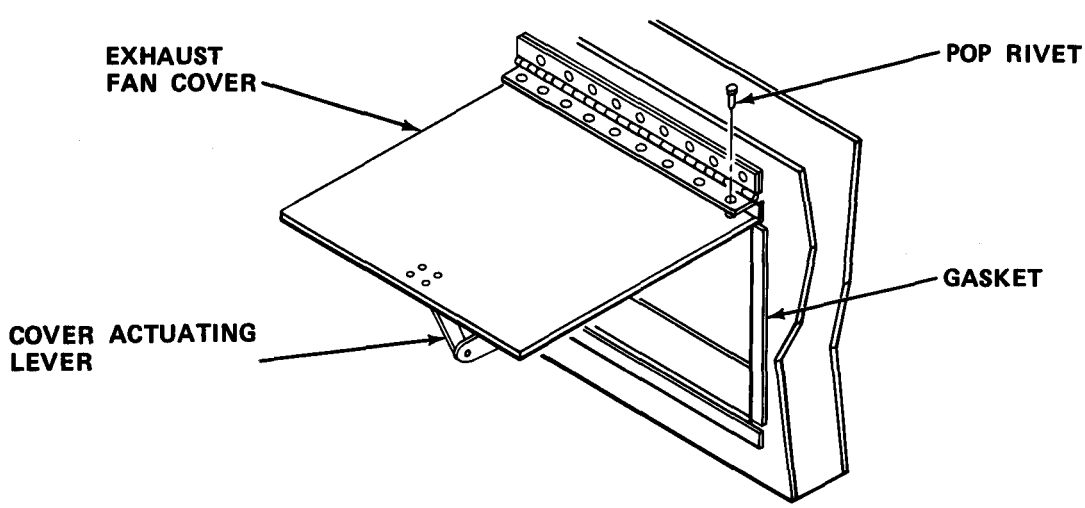
m. Plug in power cord.

1-16.10 Replace Exhaust Fan Cover.

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

TOOLS: Drill and Bits
Pop Rivet Gun
Scraper

SUPPLIES: Pop Rivets
Exhaust Fan Cover
Gasket
Solvent P-D-680 (Item 26, Appendix E)
Adhesive (Item 2, Appendix E)
Cheesecloth (Item 6, Appendix E)
Impermeable Gloves
Goggles



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

b. Remove defective vent 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 section and clean area with solvent P-D-680.

d. Secure new gasket to section with adhesive.

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

f. Test cover for tightness of closure.

1-16.11 Replace Emergency Light Assembly

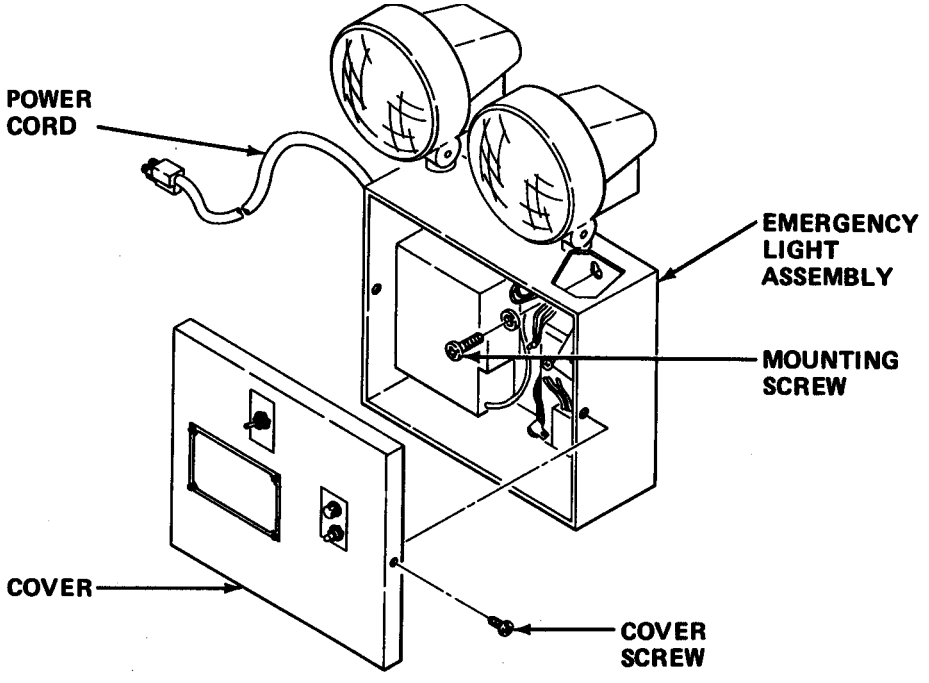
MOS: 83FJ6, Reproduction Equipment Repairer
or
41B, Topographic Instrument Repair Specialist

TOOLS: Cross Tip Screwdriver
Flat Tip Screwdriver

SUPPLIES: Emergency Light Assembly

WARNING

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



a. Unplug power cord.

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

c. Remove mounting screws.

d. Remove emergency light assembly.

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

f. Secure cover with screws.

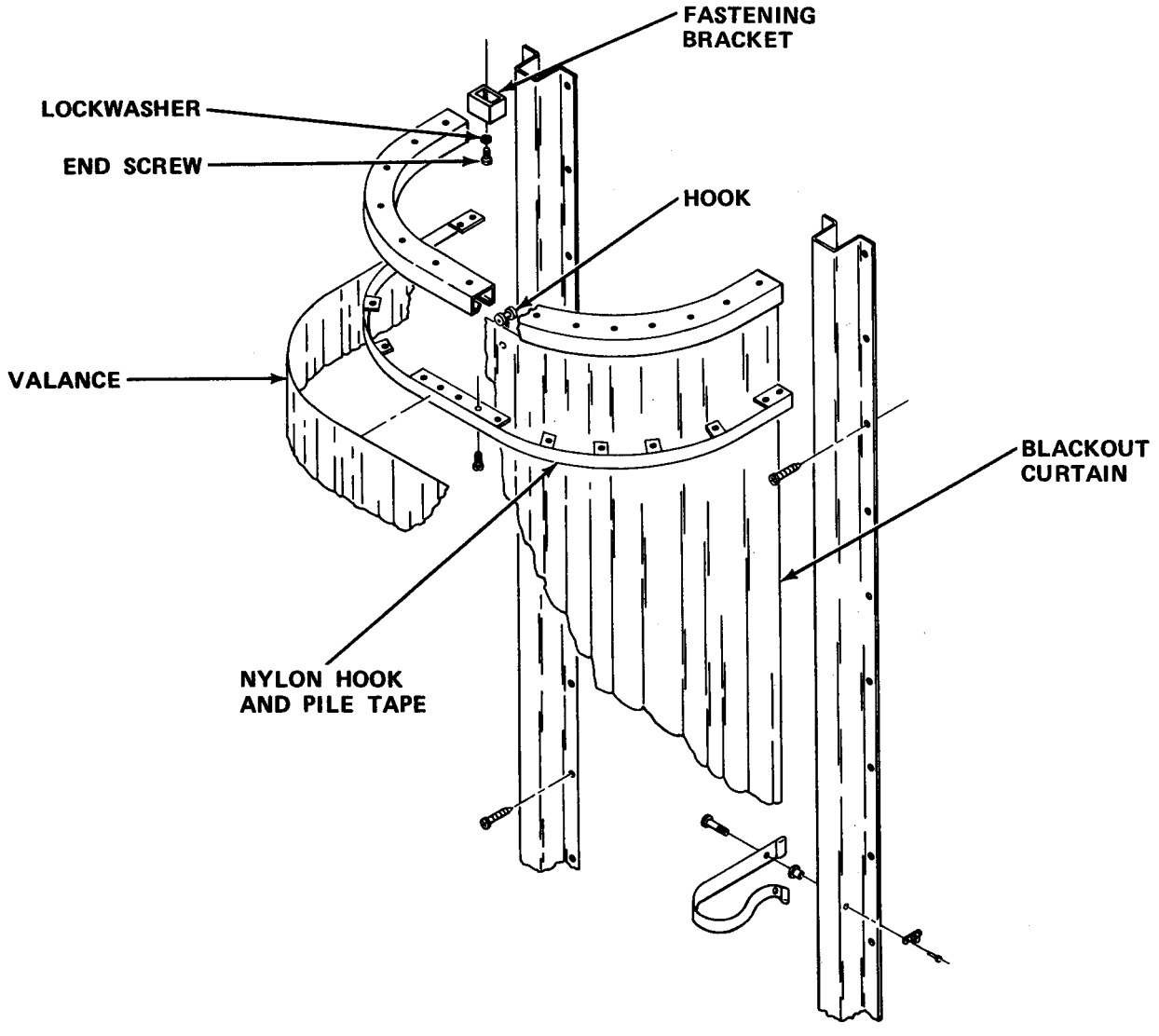
g. Plug in power cord.

1-16.12 Repair Blackout Curtain.

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

TOOLS: Cross Tip Screwdriver

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



a. Remove curtain from hooks.

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

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

d. Replace damaged hooks.

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

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

g. Hook curtain to bracket.

h. Attach valance.

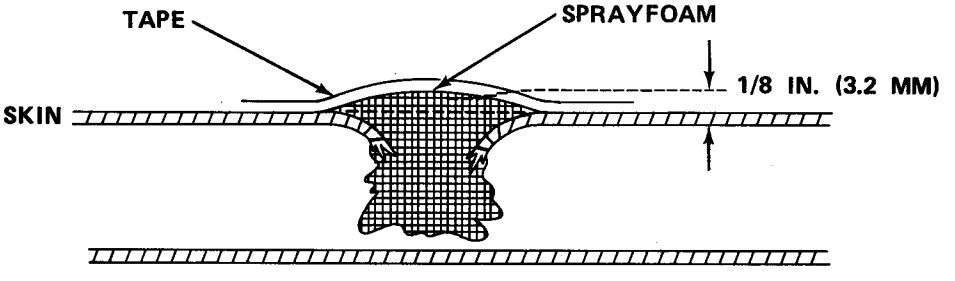
i. Check curtain for free movement.

1-16.13 Repair Van Body Skin (Temporary).

MOS: 52C, Utilities Equipment Repairer

TOOLS: Pliers
Ball Peen Hammer
Scissors or Utility Knife

SUPPLIES: Cloth Duct Sealing Tape (Item 29, Appendix E)
Silicone Sealant (Item 25, Appendix E)
Sprayfoam Sealant (Item 28, Appendix E)
Cheesecloth, (Item 6, Appendix E)



a. Bend broken edges of punctured skin inward into puncture 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 it taut, apply tape 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.

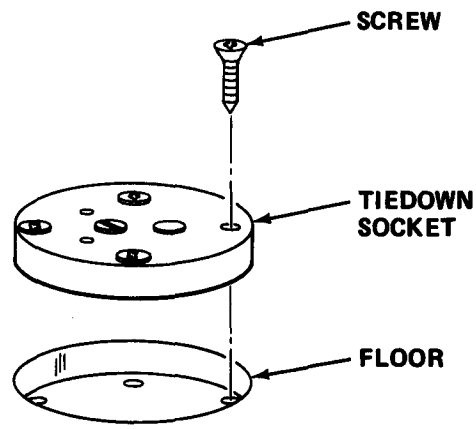
g. If necessary, damaged tape can be replaced; however, it should be removed with careful peeling motion to avoid damage to sealant. If sealant also peels back, new sealant should be applied. Complete removal of old sealant is not necessary. Permanent repair by direct support, or higher category of maintenance,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

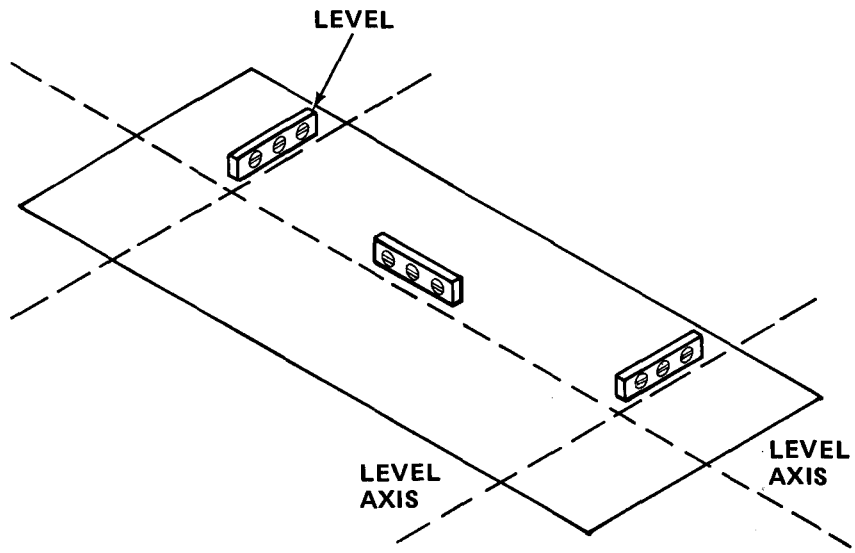
d. Reinstall screws.

1-16.15 Repair Level Indicator.

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

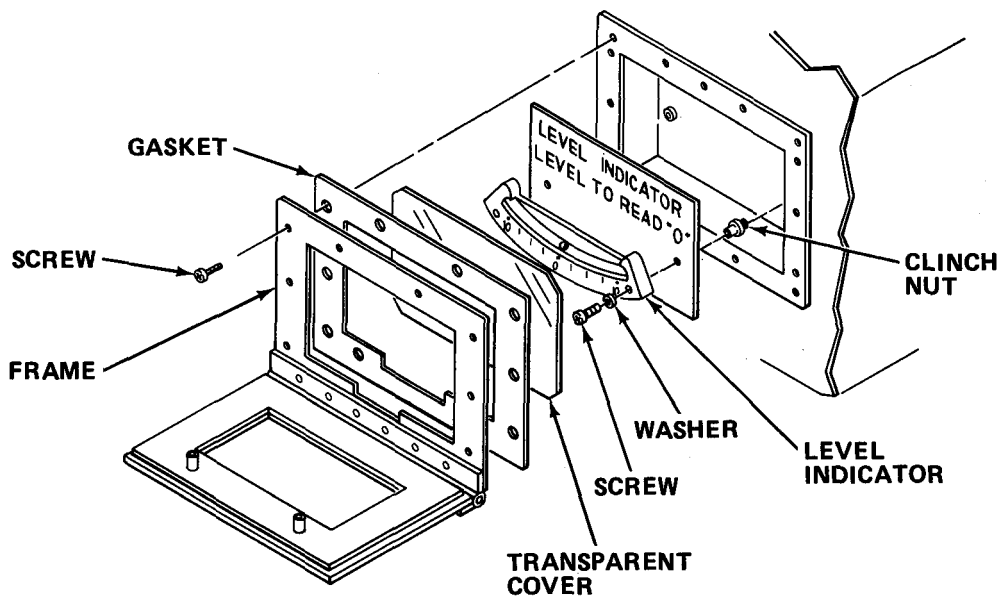
TOOLS: Carpenter's Level
Cross Tip Screwdriver
Knife, TL-29

SUPPLIES: Level Indicator
Gasket



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

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



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

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

e. Remove transparent cover.

f. Remove screws and washers to remove level indicator.

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

h. Reinstall transparent cover.

i. Install new gasket.

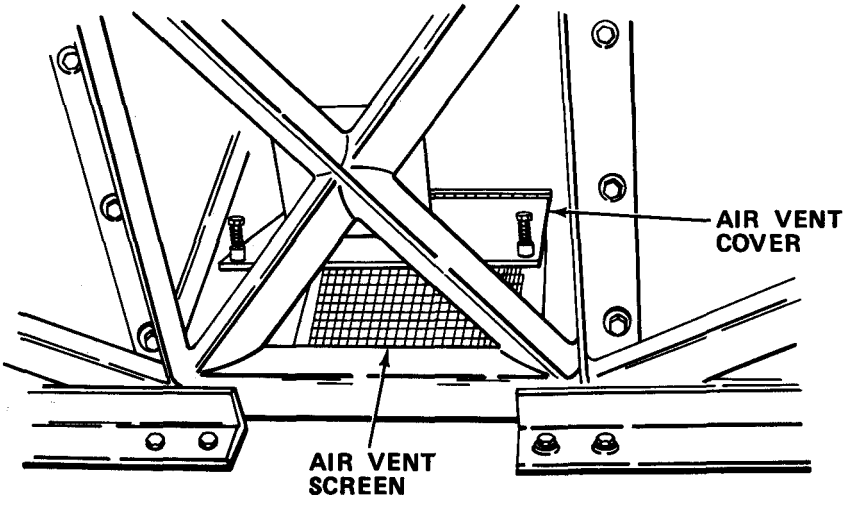
j. Reinstall frame and secure with screws and washers.

1-16.16 Replace Air Vent Screen.

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

TOOLS: Cross Tip Screwdriver
Scissors

SUPPLIES: Rubber Adhesive (Item 2. Appendix E)
Nylon Screen (Item 24, 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.

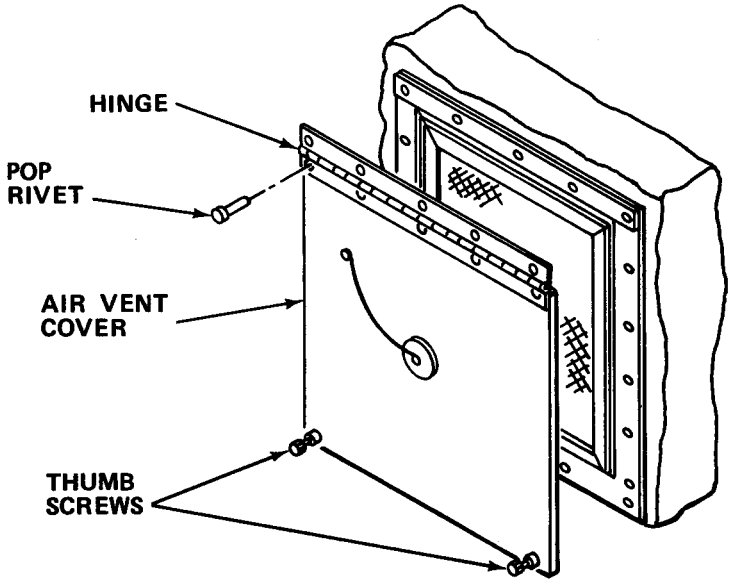
e. Reinstall frame to section and secure with screws. Lower cover.

1-16.17 Replace Air Vent Cover.

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

TOOLS : Drill and Bits
Pop Rivet Gun

SUPPLIES: Vent Cover
Pop Rivets



a. Loosen thumbscrews.

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

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

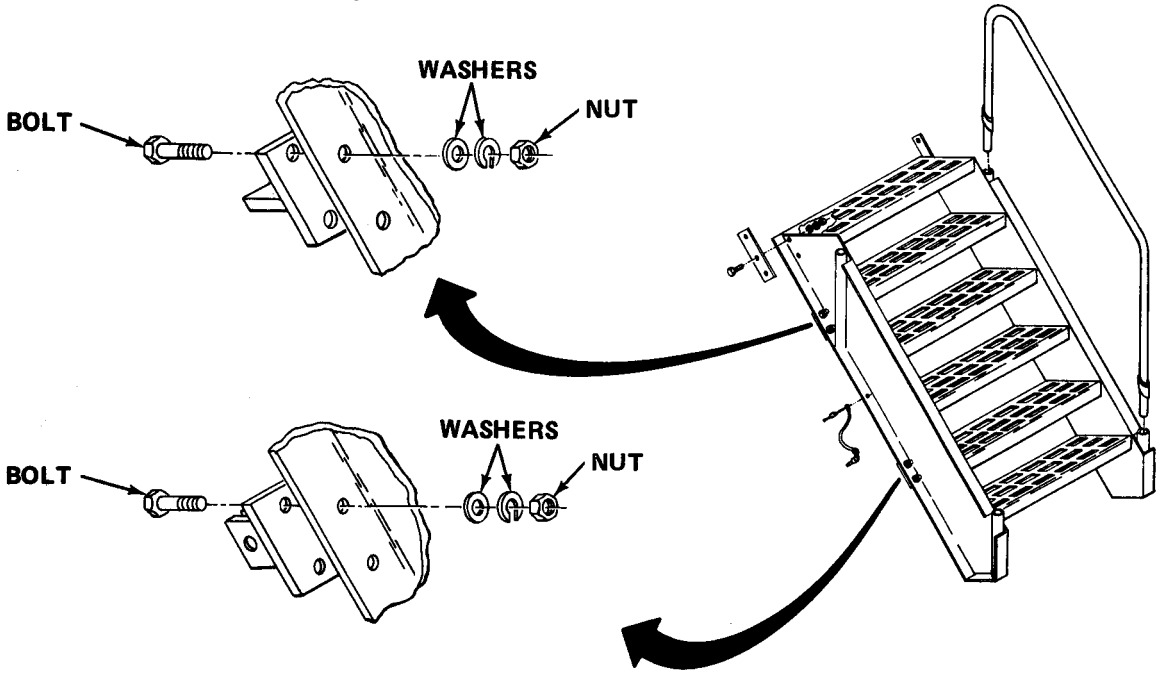
d. Tighten thumbscrews.

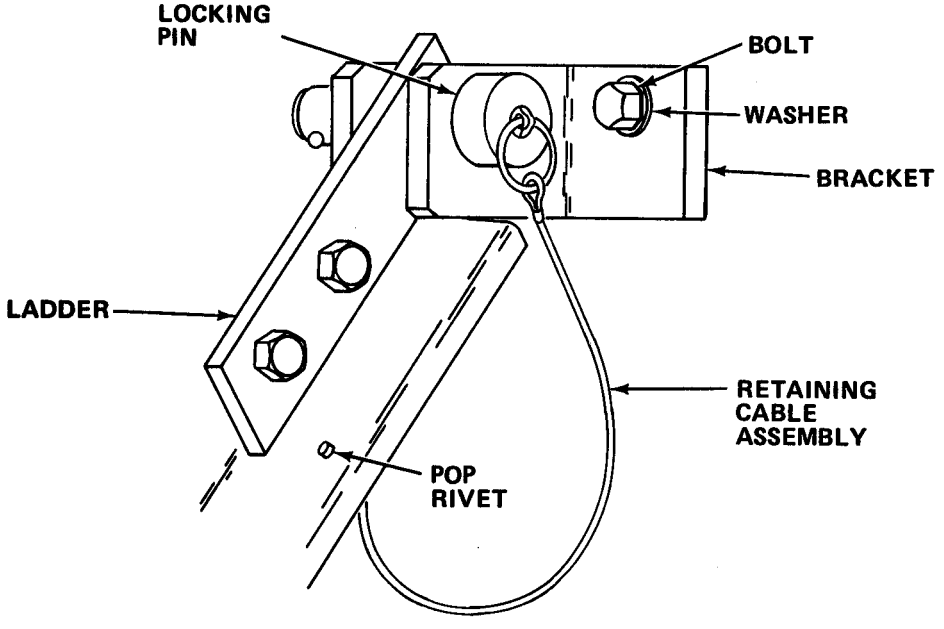
1-16.18 Repair Personnel Ladder.

MOS: 63W, Wheel Vehicle Repairer

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

SUPPLIES: Cable Assembly
Quick Release Pins
Pop Rivets
Mounting Brackets





a. Remove ladder from mounting bracket.

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

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

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

e. Rivet new cable assembly to ladder.

NOTE

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

f. Reinstall ladder on mounting bracket.

1-17. PREPARATION FOR STORAGE OR SHIPMENT.

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

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

c. Remove all unauthorized or personal equipment from section.

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

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

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

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

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

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

1-18.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-361O-253-24P 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 is not corrected by a listed corrective action, notify your supervisor.

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

Table 1-5. DIRECT/GENERAL SUPPORT TROUBLESHOOTING

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

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

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

1-20. MAINTENANCE PROCEDURES.

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

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

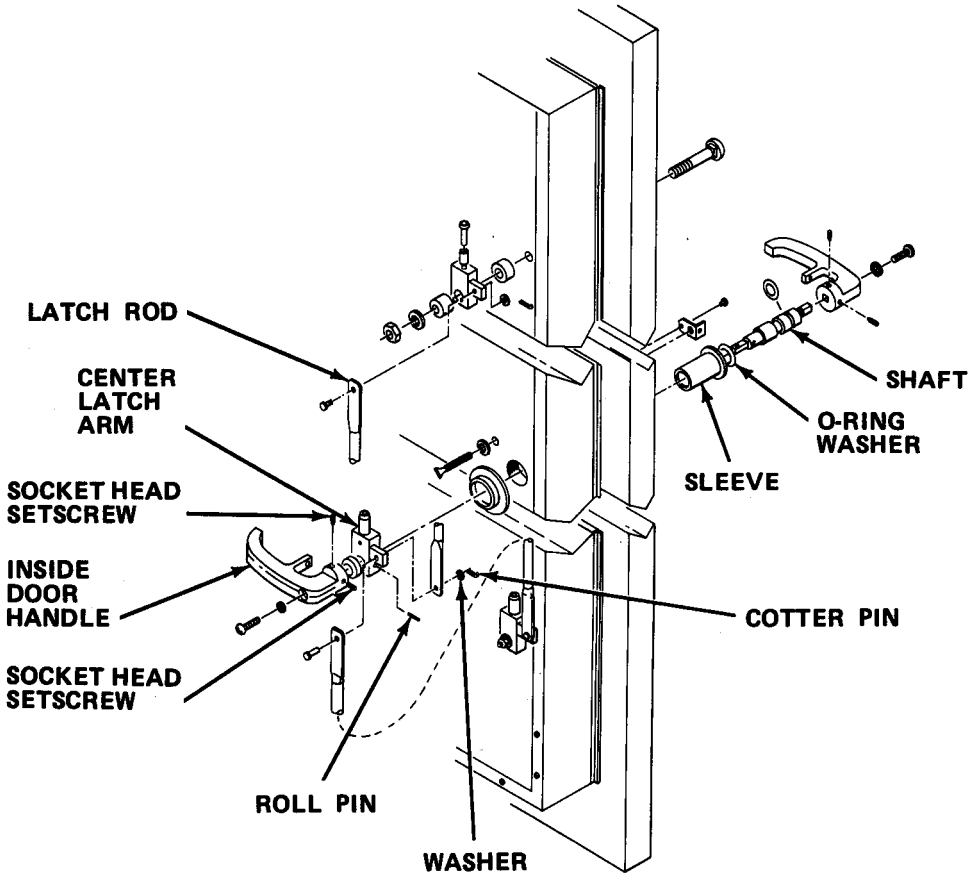
INDEX

1-20.1 Repair Personnel Door Handle.

MOS: 63W, Wheel Vehicle Repairer

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

SUPPLIES: O-Ring Washer
Sleeve
Roll Pin
Personnel Door Handle
Cheesecloth (Item 6, Appendix E)
Oil, Lubricating, General Purpose (Item 16, Appendix E)
Hand Oiler
Cotter Pin



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

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

c. Move latch rods out of way.

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

e. Withdraw latch and defective door handle.

f. Inspect all components for wear.

g. Replace worn O-ring washer and sleeve.

h. Replace other worn components as needed.

i. Reinstall latch and new 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.

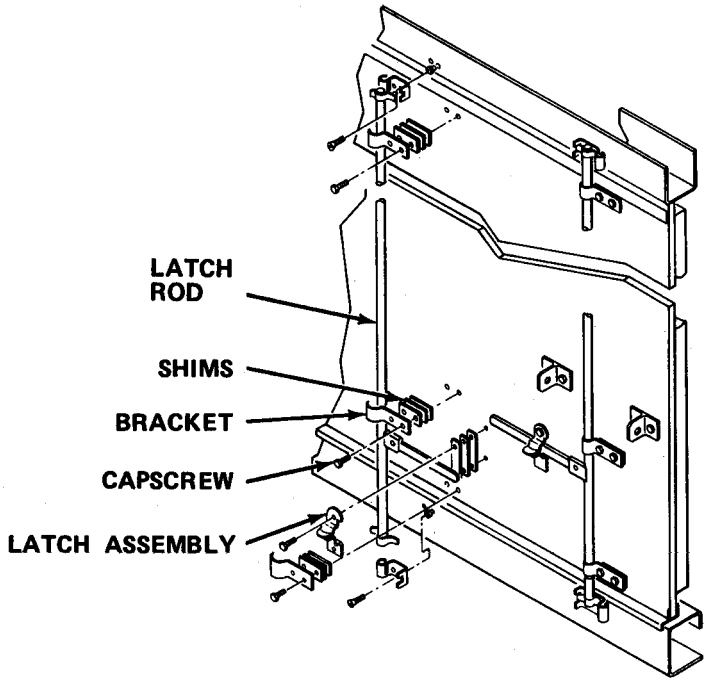
m. Lightly oil all moving parts. Wipe up surplus oil.

1-20.2 Replace Carago Door Latch Assembly.

MOS: 63W, Wheel Vehicle Repairer

TOOLS: 9/16 in. Combination Wrench

SUPPLIES: Cargo Door Latch Assembly



a. Unlock latch.

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

c. Remove defective latch assembly and latch rod.

d. Install new latch assembly and latch rod.

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

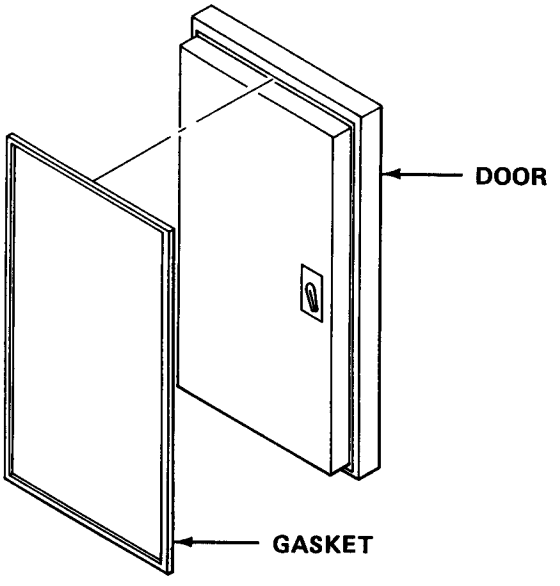
f. Check movement of latch rod and latch assembly. Lock latch.

1-20.3 Replace Personnel/Cargo Door Gasket.

MOS: 63W, Wheel Vehicle Repairer

TOOLS: Knife

SUPPLIES: Vinyl Gasket
Adhesive (Item 3, Appendix E)
Solvent P-D-680 (Item 26, Appendix E)
Impermeable Gloves
Goggles
Cheesecloth (Item 6, 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

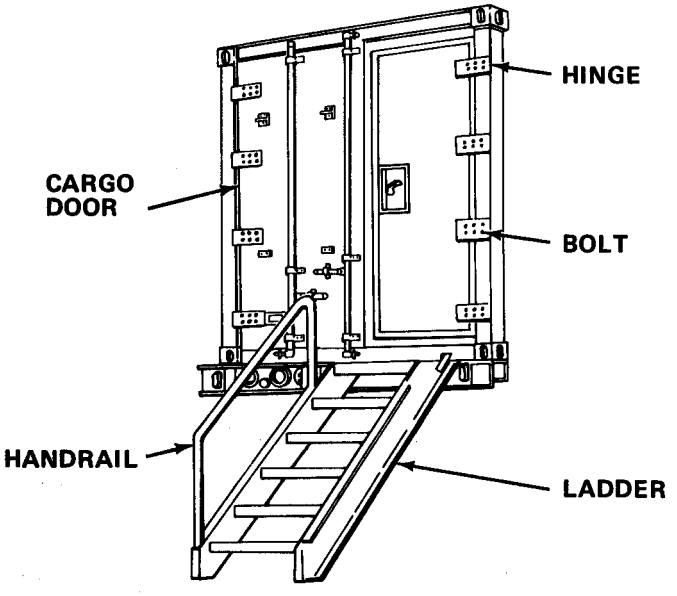
PERSONNEL: Two persons are required to perform this procedure.

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

SUPPLIES: Personnel/Cargo Door
Pop Rivets
Vinyl Gasket
Paint (Item 18, Appendix E)
Paint (Item 19, Appendix E)
Adhesive (Item 3, Appendix E)
Cheesecloth (Item 6, Appendix E)

WARNING

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



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

i. Reinstall circuit breaker box cover.

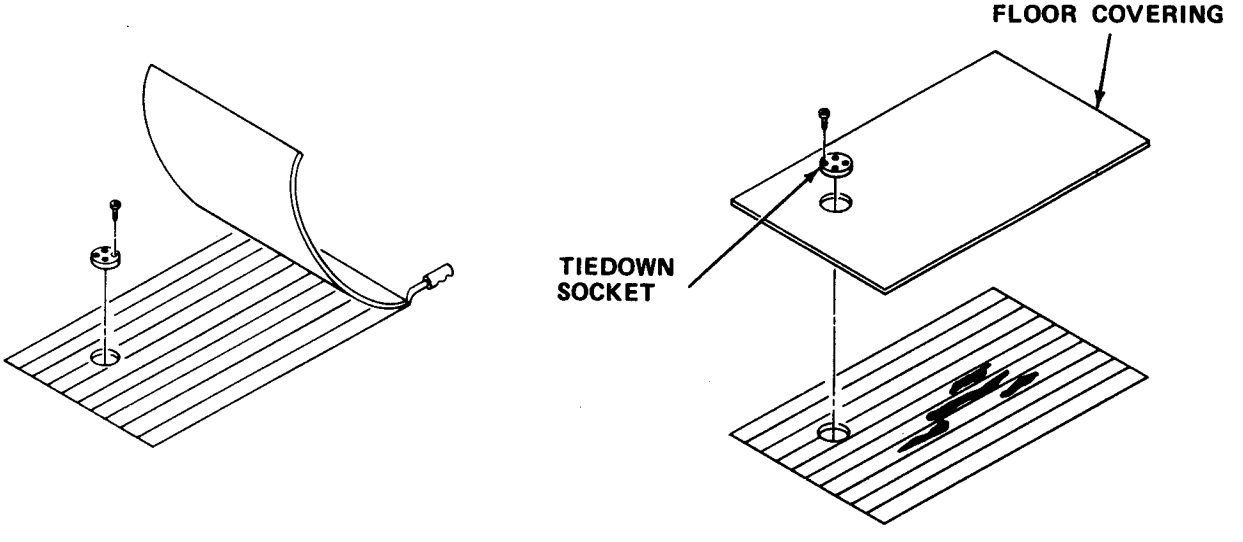
j. Remove padlock and turn on safety switch and individual circuit breakers.

1-20.6 Repair Floor Covering.

MOS : 52C, Utilities Equipment Repairer

TOOLS: Utility Knife
Cross Tip Screwdriver
Scraper
Straightedge

SUPPLIES: Vinyl Floor Covering
Epoxy Resin (Item 22, Appendix E)
Floor Patch (Item 9, Appendix E)
-Cheesecloth (Item 6, Appendix E)
Adhesive (Item 3, Appendix E)



a. Cut a rectangular area from damaged floor covering.

b. Remove tie down socket. Remove damaged floor covering.

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

d. Reinstall tie down socket.

1-20.7 Repair Van Body Skin (Permanent).

MOS: 63W, Wheel Vehicle Repairer

TOOLS: Pop Rivet Gun
Electric Drill and Bits
Paint Brush

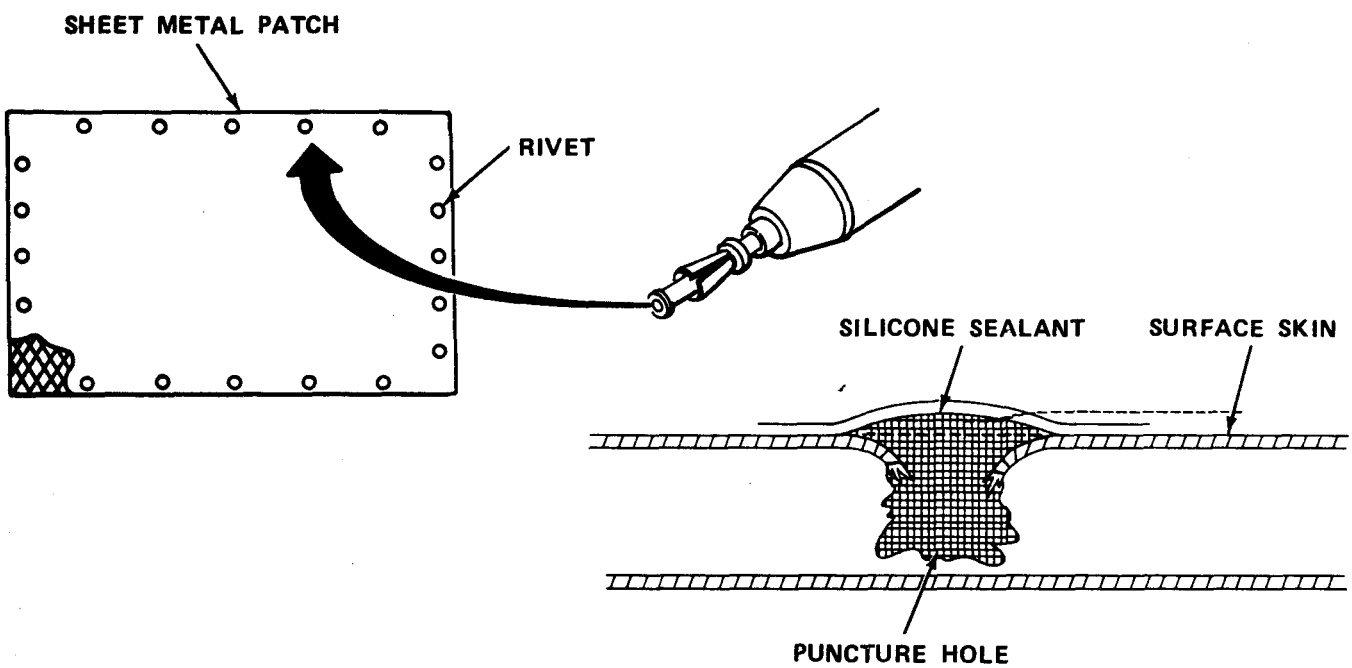
SUPPLIES: Pop Rivets
Sprayfoam Sealant (Item 28, Appendix E)
Silicone Sealant (Item 25, Appendix E)
Sheet Metal
Paint (Items 18, 18A and 18B, Appendix E)
Cheesecloth (Item 6, Appendix E)

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.



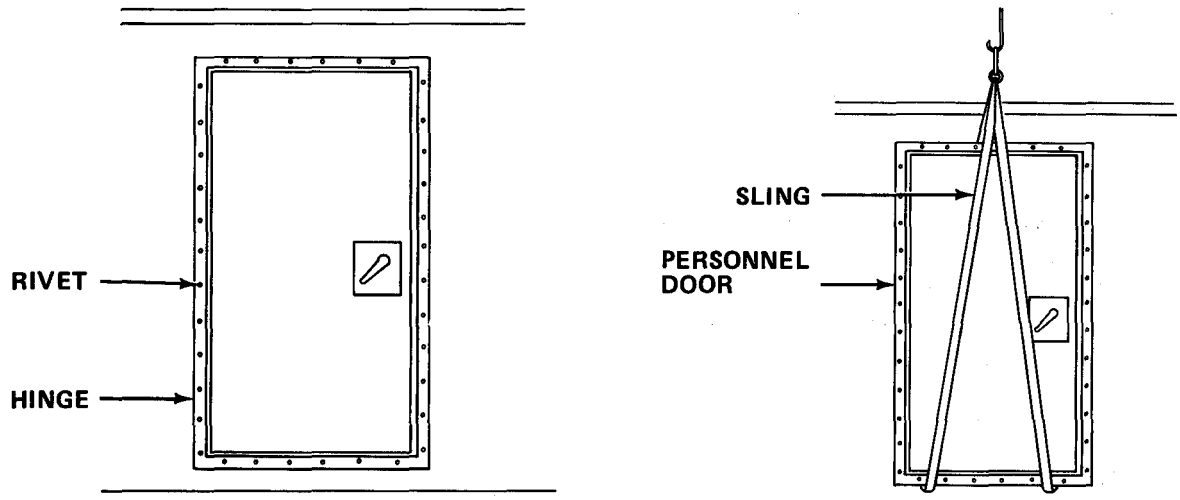
e. Prepare sheet metal patch large enough to cover damaged area with overlap.

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

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

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

b. Unlock and open door to be replaced.



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

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

e. Remove damaged door using hoist.

f. Install new door using hoist.

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

h. Remove sling from door.

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

j. Repaint as needed.

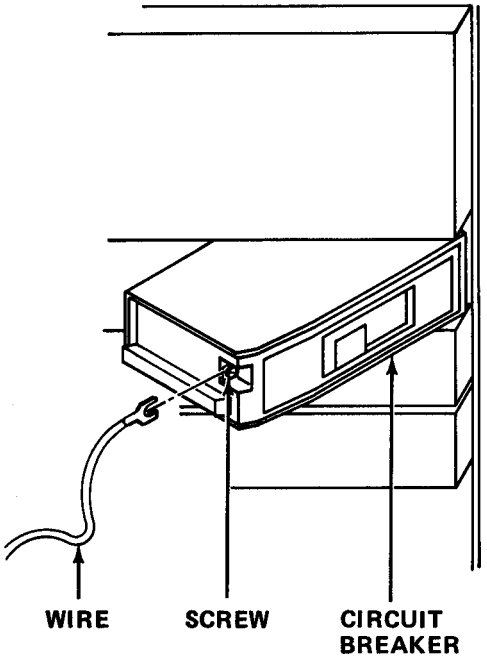
k. Close and lock door.

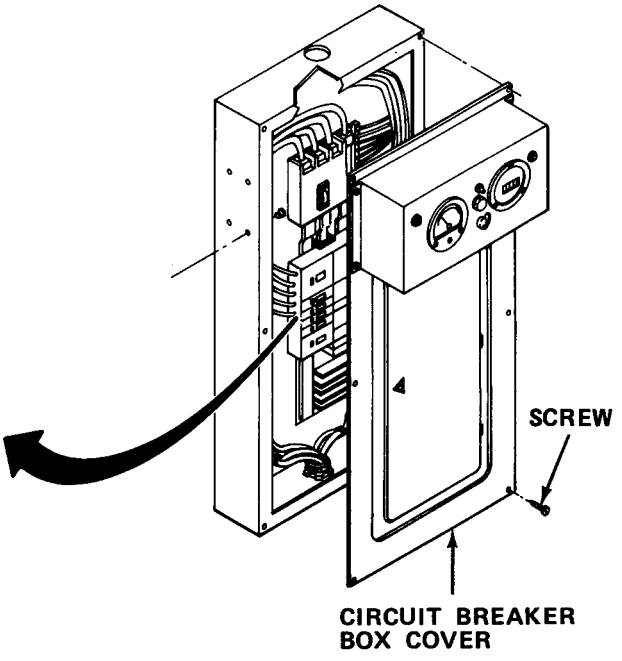
1-20.5 Replace Circuit Breaker.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
Multimeter

SUPPLIES: Circuit Breaker





WARNING

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

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

b. Remove circuit breaker box cover.

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

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

e. Tag and remove wires from defective circuit breaker.

f. Pull circuit breaker from panel.

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

h. Apply sealant to edges of patch.

i. Apply patch to van body.

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

k. Paint as needed.

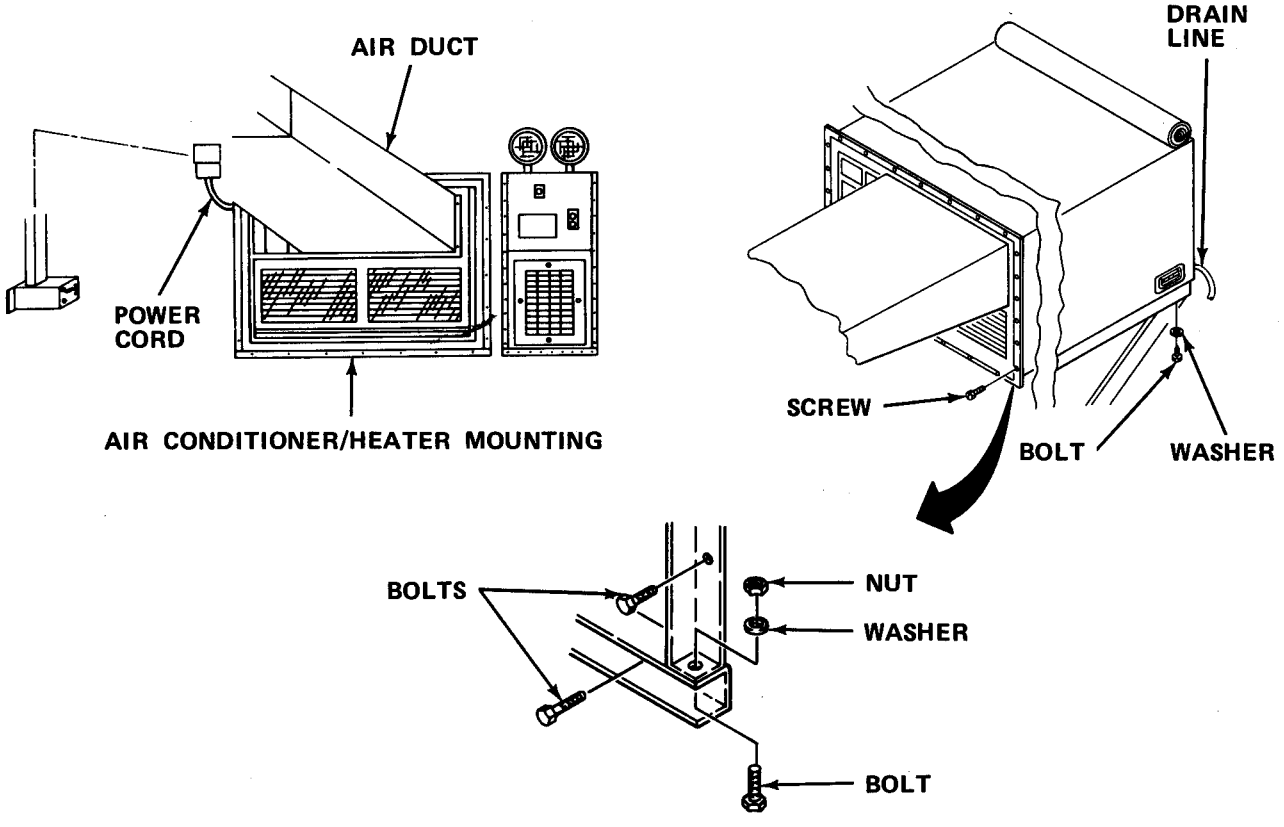
1-20.8 Replace Air Conditioner/Heater.

MOS: 63W, Wheel Vehicle Repairer

PERSONNEL: Two persons are required to perform this procedure.

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

SUPPLIES: Air Conditioner/Heater
Solvent P-D-680 (Item 26, Appendix E)
Gasket
Silicone Sealant (Item 25, Appendix E)
Adhesive (Item 2, 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 section.

d. Disconnect drain line from air conditioner/heater.

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

f. Remove mounting bolts and washers.

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

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

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

WARNING

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

j. Clean sealant from opening using dry cleaning solvent P-D-680.

k. Remove damaged gasket and replace with new gasket.

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

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

n. Remove remaining sling.

o. Reinstall washers and mounting bolts.

p. Reconnect drain lines.

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

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

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

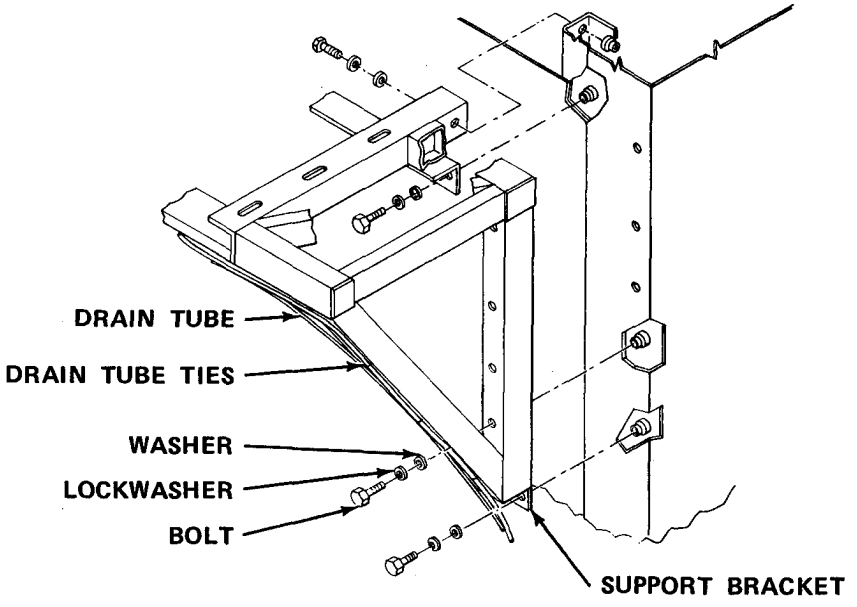
1-20.9 Replace Air Conditioner Support Bracket.

MOS: 63W, Wheel Vehicle Repairer

PERSONNEL: Two persons are required to perform this procedure.

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

SUPPLIES: Air Conditioner Support Bracket
Drain Tube Ties



WARNING

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

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

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

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

d. Remove defective support bracket.

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

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

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

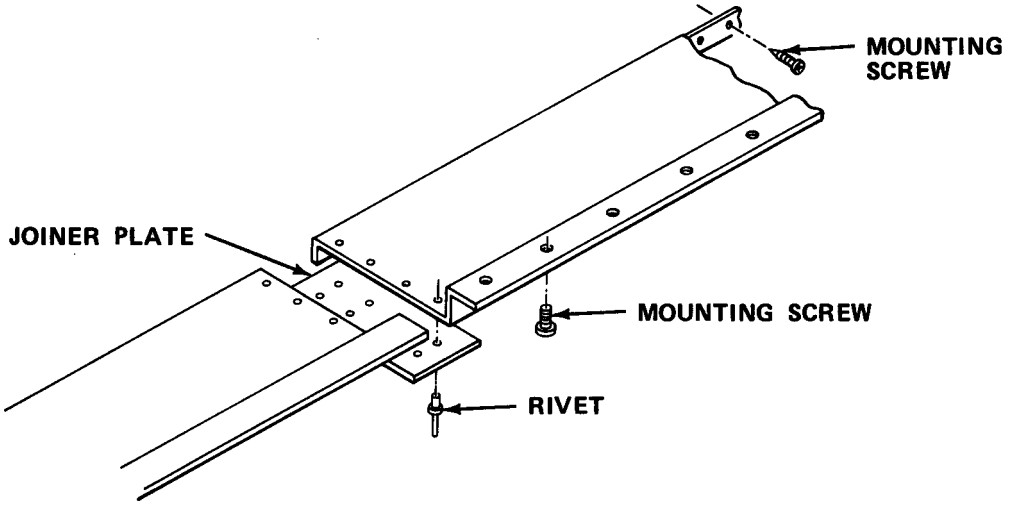
1-20.10 Replace Ventilation Duct.

MOS: 52C, Utilities Equipment Repairer

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

SUPPLIES: Silicone Sealant (Item 25, Appendix E)
Wood Block
Pop Rivets
Paint (Item 19, Appendix E)
Cheesecloth (Item 6, 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.

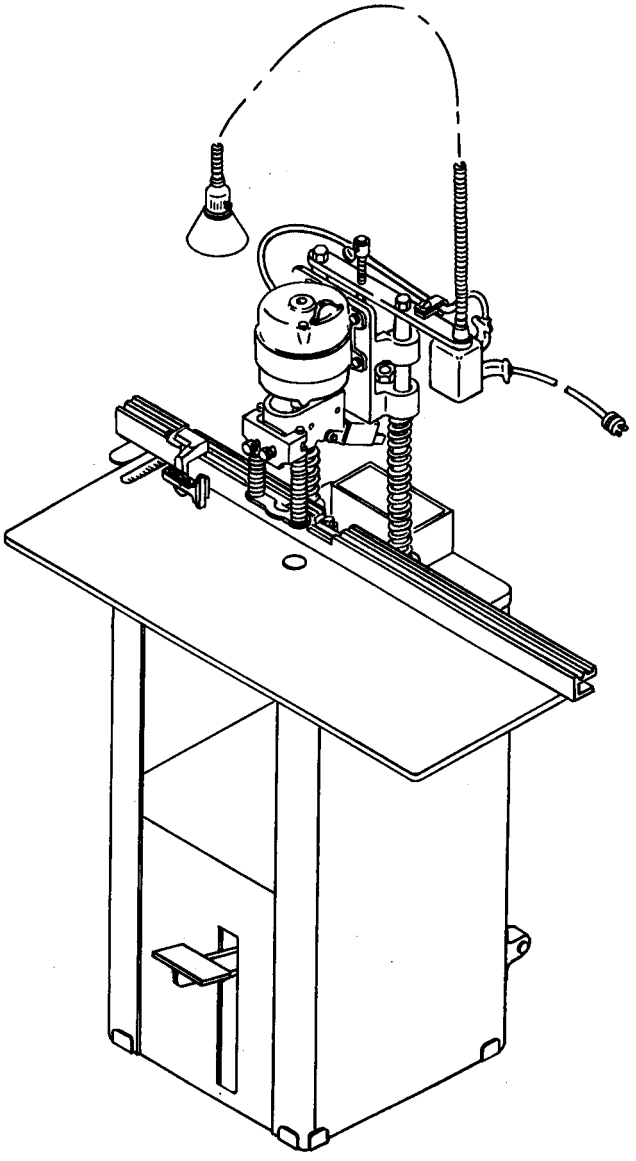
e. Place silicone sealant on mounting edges.

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

g. Reinstall joiner plates. Install rivets to secure.

h. Paint as necessary.

i. Turn on air conditioner/heater.



CHAPTER 2

PAPER DRILLING MACHINE

Section I INTRODUCTION

2-1. GENERAL INFORMATION.

2-1.1 Scope.

a. Model Number and Equipment Name. Model JF Paper Drilling Machine.

b. Purpose of Equipment. To drill holes in stock or finished paper products.

2-2. EQUIPMENT DESCRIPTION.

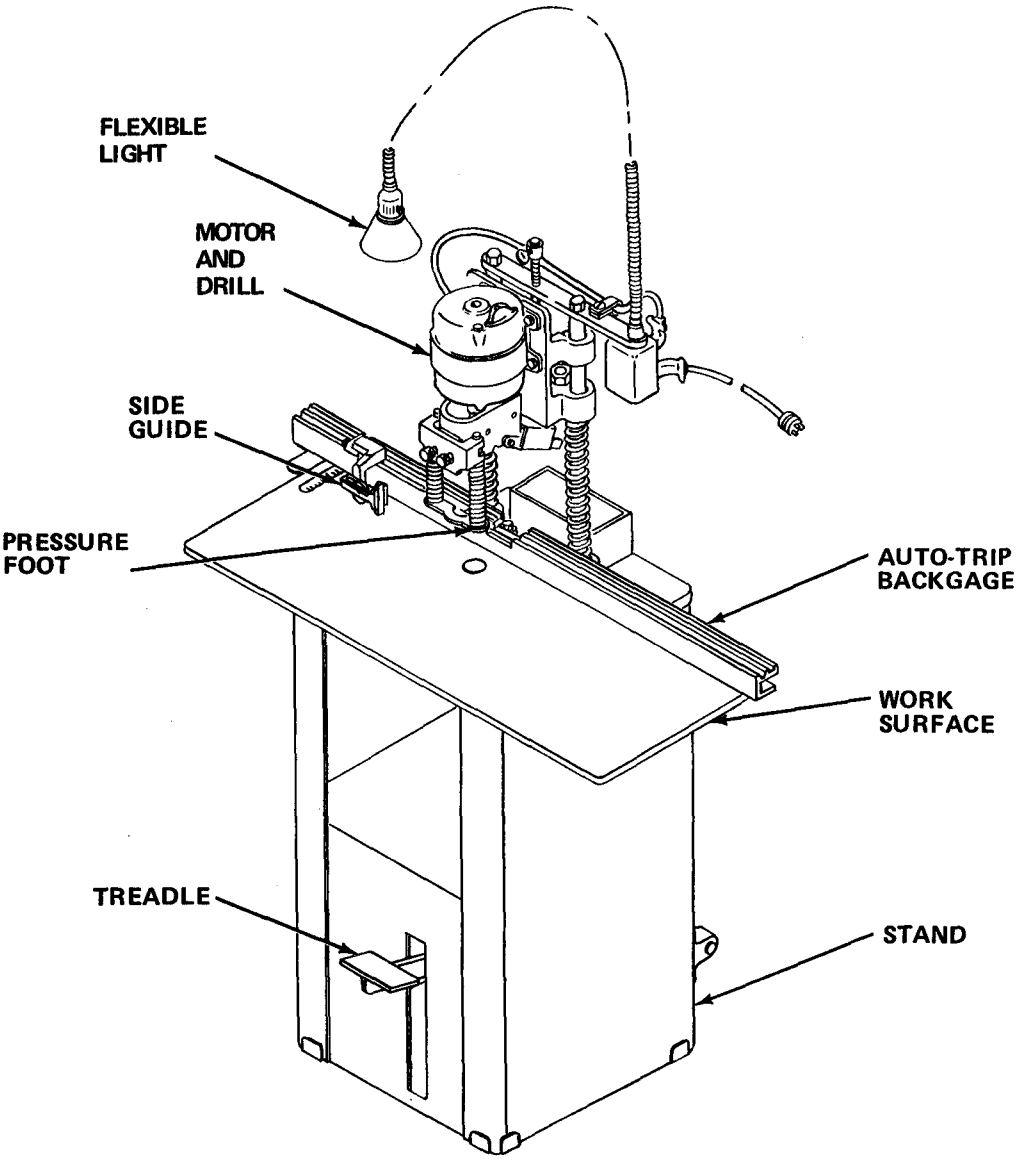
2-2.1 Equipment Characteristics. Capabilities. and Features.

a. Electrically powered.

b. Foot operated.

c. Automatic backgage trip.

2-2.2 Location and Description of Major Components.



MOTOR AND DRILL. Electric motor rotates hollow drill.

FLEXIBLE LIGHT. Illuminates work surface.

AUTO-TRIP BACKGAGE. Alines work. Auto-trip feature permits work to be pushed to new drilling position after each drilling.

WORK SURFACE. Supports work and auto-trip backgage.

STAND. Supports motor and drill.

TREADLE. Mechanically linked to drill and motor. Foot pressure pulls spinning drill through work, compresses springs.

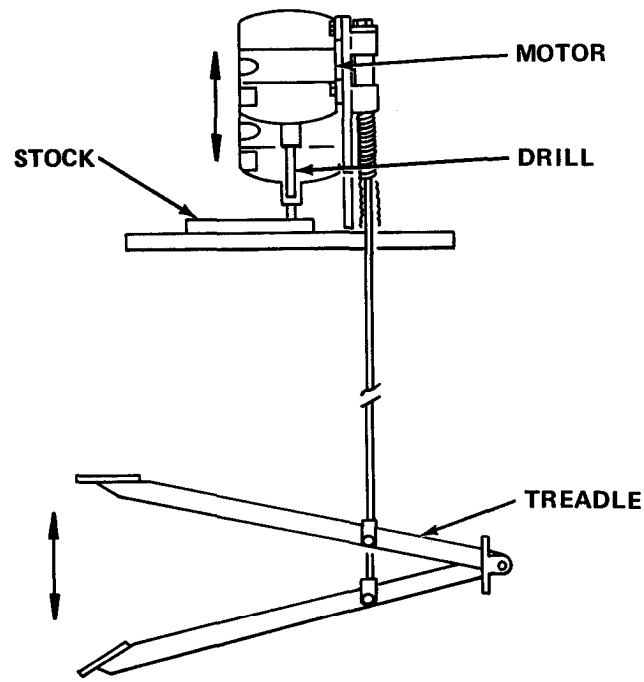
SIDE GUIDE. Component of auto-trip backgage. Positions work.

PRESSURE FOOT. Clamps work when drill is lowered.

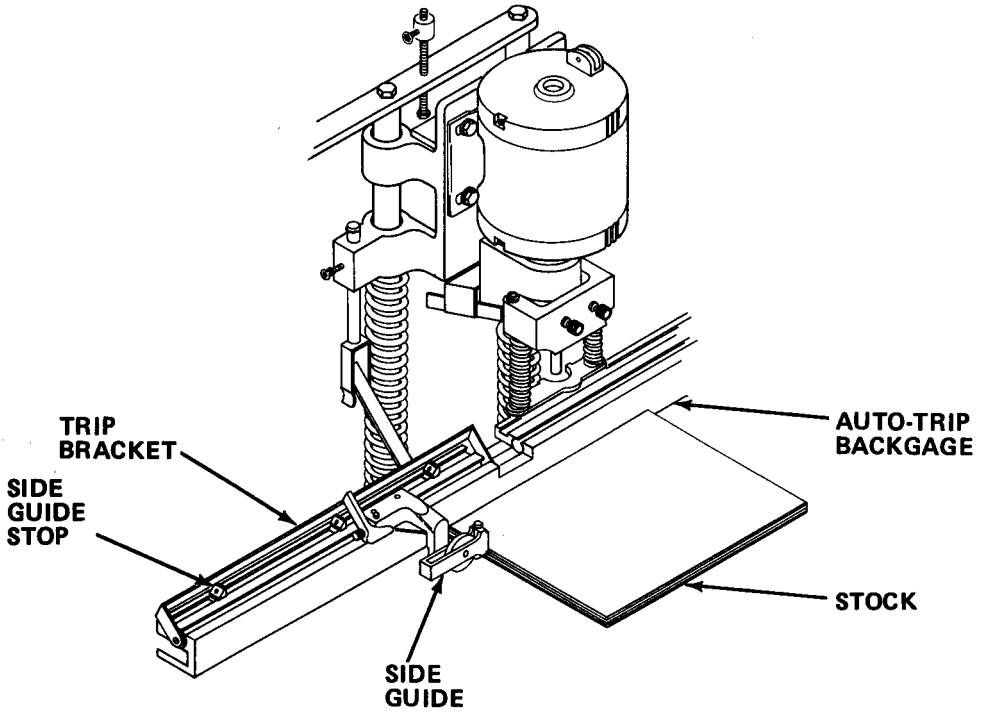
2-2.3 Equipment Data.

Maximum Work Thickness	2 in. (5.08 cm)
Drill Size (Max)	1/2 in. (12.7 mm)
Number of Backgage Stops	7
Power Requirements	110 V, 60 Hz, single-phase

2-3. TECHNICAL PRINCIPLES OF OPERATION.

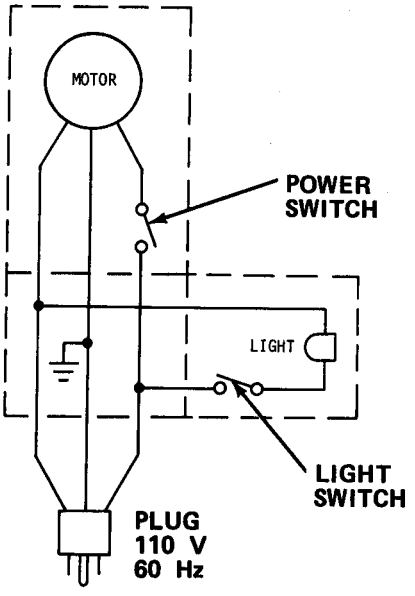


2-3.1 Drill. Foot pressure on the treadle lowers the motor and spinning drill. Drill penetrates the paper. Release of pressure on the treadle permits springs to return motor and drill to normal position.



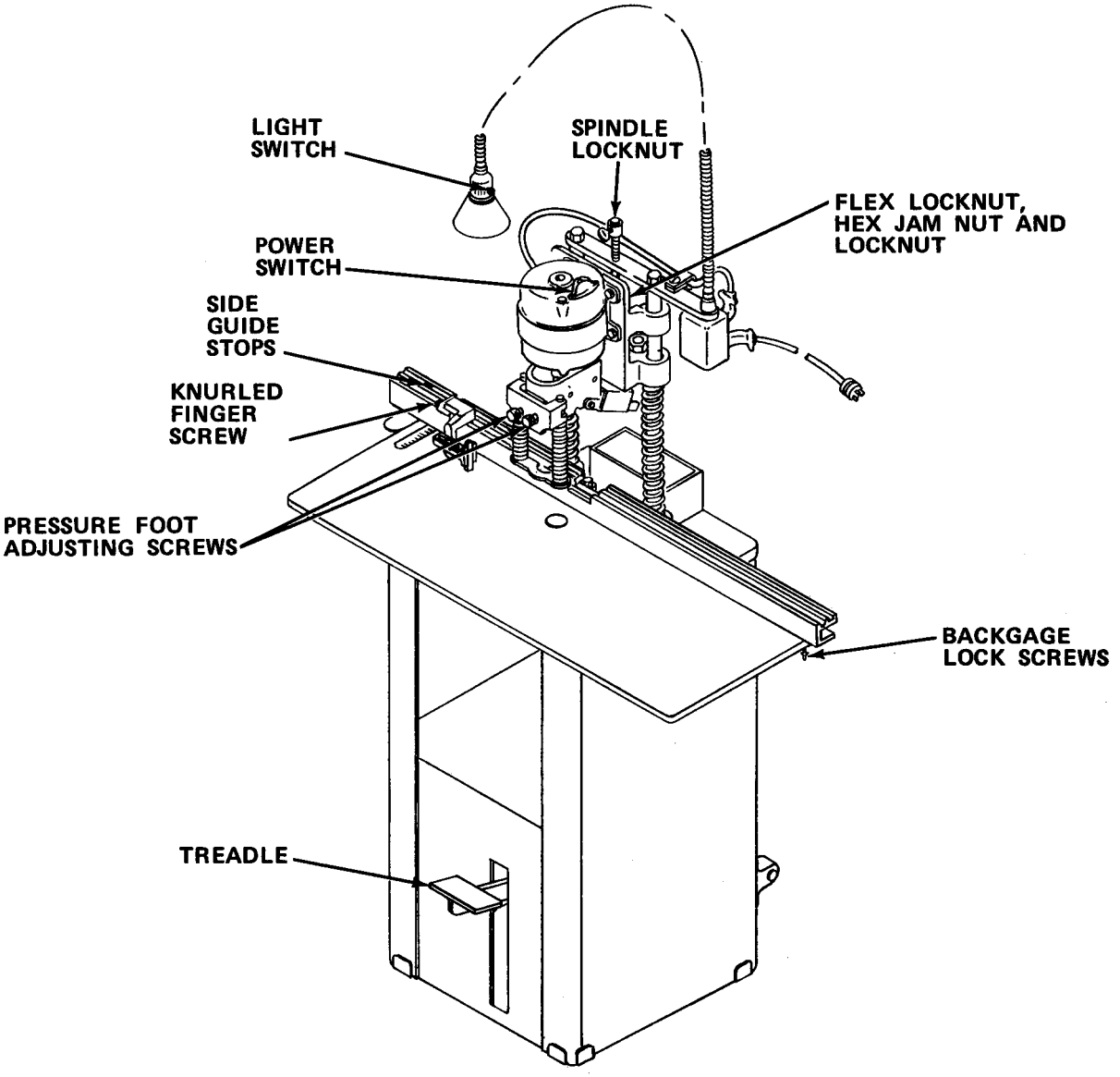
2-3.2 Auto-Trip Backgage. The trip bracket is raised and lowered by movement of the motor. Raising the trip bracket permits the trip assembly to clear side guide stops . Side guide can then be pushed to the next side guide stop.

2-3.3 Power Supply. 110 V, 60 Hz electrical power operates the motor when the power switch is closed. Electric light is independently controlled by the light switch.



Section II OPERATING INSTRUCTIONS

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



Control or Indicator	Function
Light Switch	Controls light.
Spindle Locknut	Controls drill cutting depth. Turning to left lowers drill. Turning to right raises drill. Held in-position by thumb screw.
Flex Locknut, Hex Jam Nut	Adjust height of pressure foot above work surface.
Backgage Lock Screws	Position and hold backgage distance from drill.
Treadle	Lowers and raises drill.
Knurled Finger Screw	Fine adjustment of side guide position increases or decreases distance to drill.
Side Guide Stops	Metal stops in slotted keyway locked by setscrew. Position side guide for each hole to be drilled.
Pressure Foot Adjusting Screws	Attach pressure foot and aline pressure foot to work surface.
Power Switch	Turns motor on or off. Drill rotates as long as switch is on.

2-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

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

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

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

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

2-5.1 PMCS Procedures.

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

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

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

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

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

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

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

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

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

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

Item	Quantity
Drill Drift	1 ea
Safety Glasses	1 ea
Carborundum Pencil (Item 4, Appendix E)	ar
Cheesecloth (Item 6, Appendix E)	ar
General Purpose Oil (Item 16, 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 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

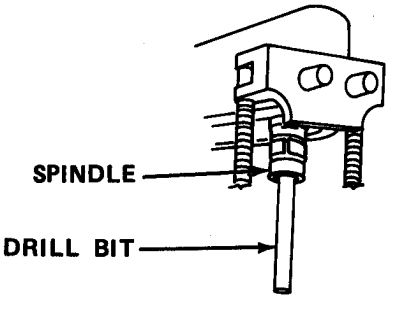
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER DRILLING MACHINE	
1	B	Inspect Drilling Machine.	
		1. Turn power off.	
		WARNING Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.	
		2. Unplug power cord.	
		3. Inspect drilling machine for loose or missing bolts or screws.	
		4. Inspect power cord and wiring for frayed insulation or broken wires.	Power cord is defective.
			
		5. Push drill bit into spindle. Observe drill bit fits tightly.	

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.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER DRILLING MACHINE - Cont	
1	B	Inspect Drilling Machine - Cont	

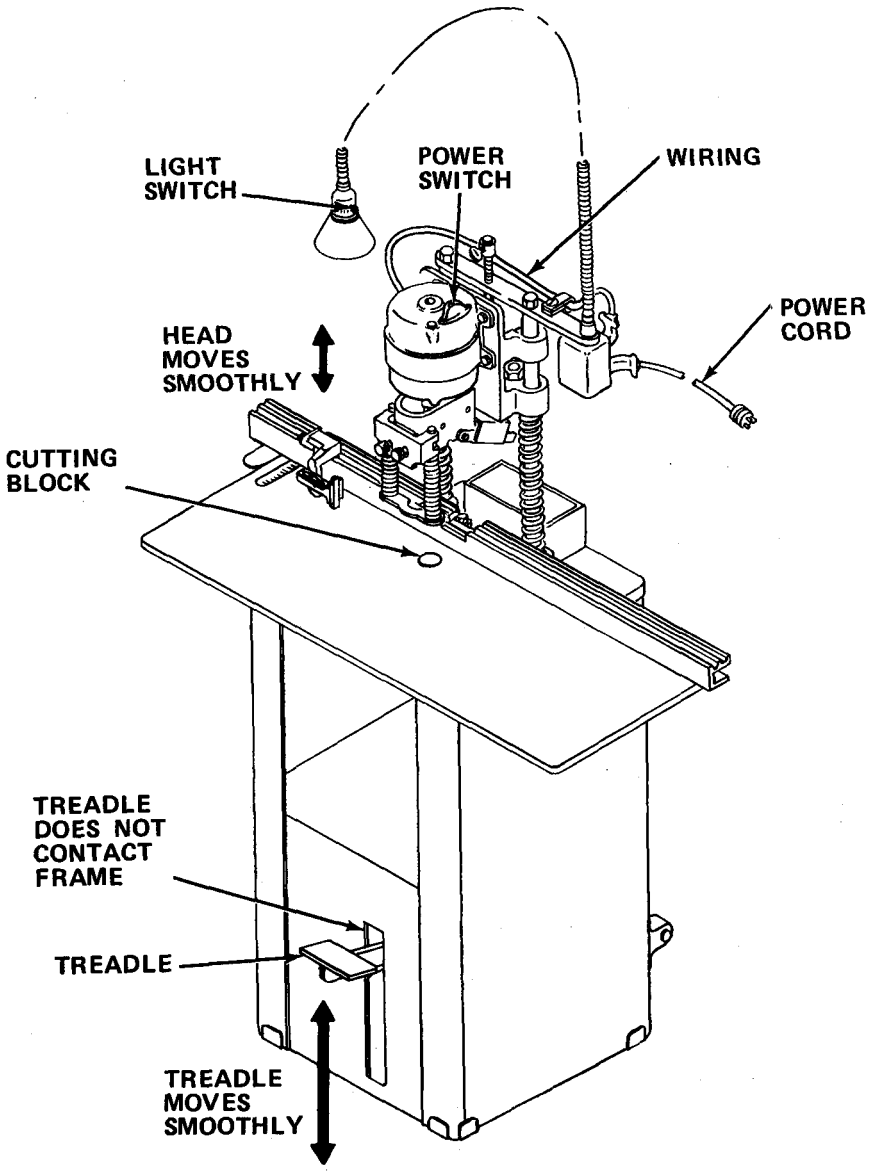


Table 2-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

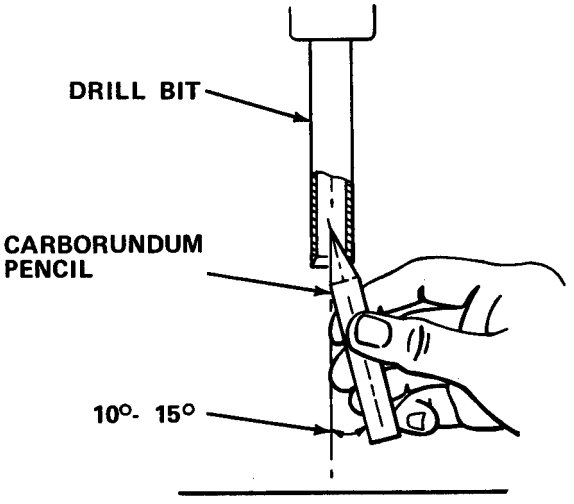
B . Before W - Weekly AN - Annually (Number) - Hundreds of Hours
D - During M - Monthly S - Semiannually
A . After Q - Quarterly Bl - Biennially

ITEM NO.	INTER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Reediness Reporting, Equipment Is Not Reedy/ Available If:
		PAPER DRILLING MACHINE - Cont	
1	B	Inspect Drilling Machine - Cont	
		6. Step on treadle. Check that head moves down smoothly and drill bit just contacts cutting block.	Head is jammed.
		7. Release treadle. Check that head moves up smoothly.	
		8. Examine cutting block. Block should not be scored, chipped, or burned.	
		9. Examine treadle. Check that treadle does not contact frame.	
		10. Plug in power cord.	
		11. Turn power on. Check that spindle does not wobble.	Spindle wobbles.
		12. Turn light on and check for proper operation. Turn off light.	
		13. Turn off power.	
2	D	Service Drill Bit.	
		1. Turn power on.	
		WARNING Blindness or serious injury may occur unless eye protection is worn when sharpening drill bit.	
		2. Put on safety glasses.	

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

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER DRILLING MACHINE - Cont	
2	D	**Service Drill Bit - Cont**	



NOTE

Excess pressure or contact may overheat drill bit. Be sure each contact with drill bit is brief with light pressure.

3. Hold Carborundum pencil firmly with point inside hollow drill bit at an approximate 10 to 15-degree angle from drill bit centerline. Hold pencil against drill bit inside surface briefly, and repeat until all nicks, burrs, or rounded surfaces are removed from edge of drill bit.

4. Turn power off.

5. Clean work surface.

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.	IN-TER WAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Readv/ Availabla If:
		PAPER DRILLING MACHINE - Cont	
3	A	Clean Drill Bit.	
		1. Turn power off.	
		WARNING	
		Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.	
		2. Unplug power cord.	
		3. Push drift hole cover down to expose drift hole.	
		4. Insert drill drift (round side down) into drift hole in chuck and lift drift upward.	

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

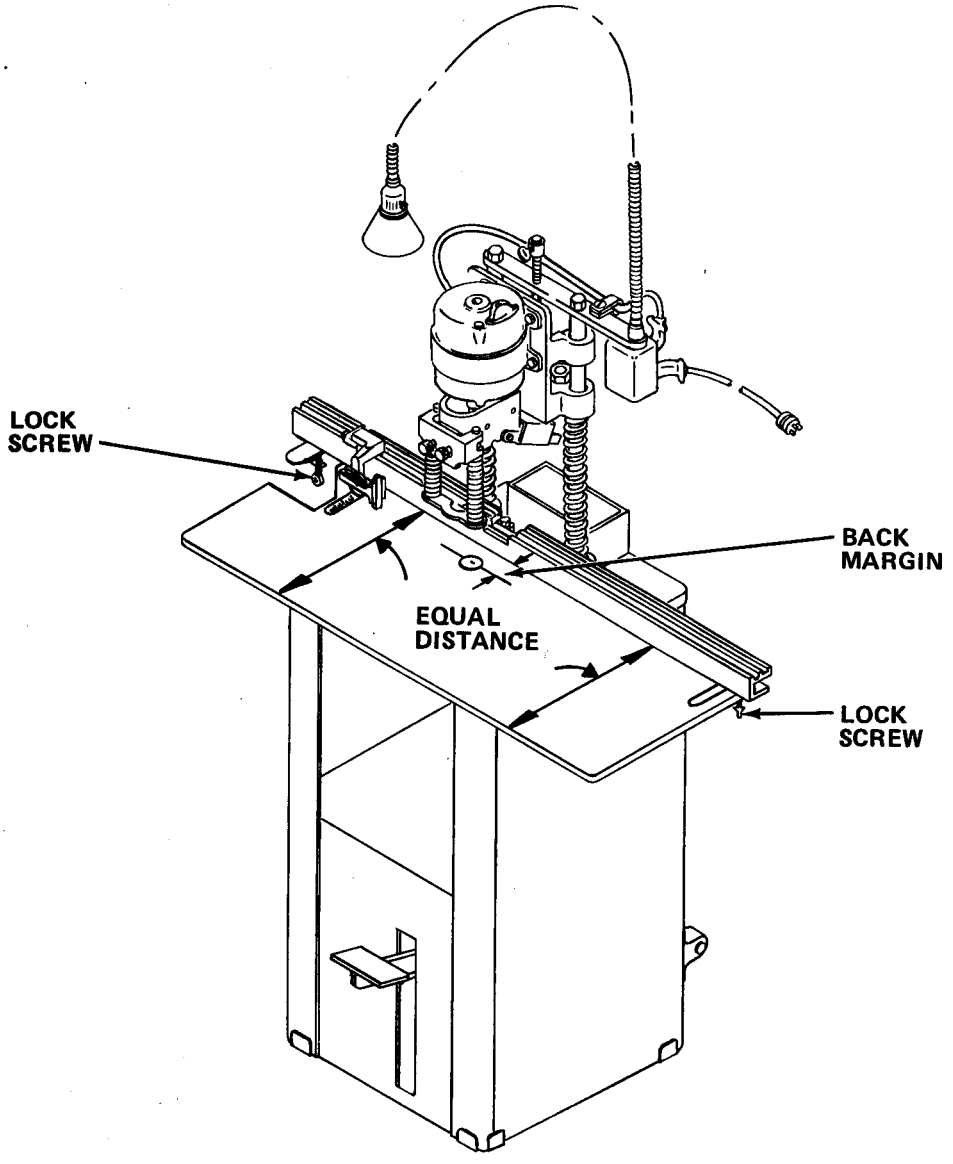
B - Before W - Weekly AN - Annually (Number) - Hundreds of Hours
D - During M - Monthly S - Semiannually
A - After Q - Quarterly Bl - Biennially

ITEM NO.	IN-TER. VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting. Equipment Is Not Ready/ Available If:
		PAPER DRILLING MACHINE - Cont	
3	A	Clean Drill Bit - Cont	
		NOTE It may be necessary to tap bottom of drill drift to release bit from chuck.	
		5. Remove any paper chips from drill bit with drill bit cleaner and remove residue from bit by wiping with oily cloth.	

2-6. OPERATION UNDER USUAL CONDITIONS.

2-6.1 Operating Procedures.

a. Set Backgage.



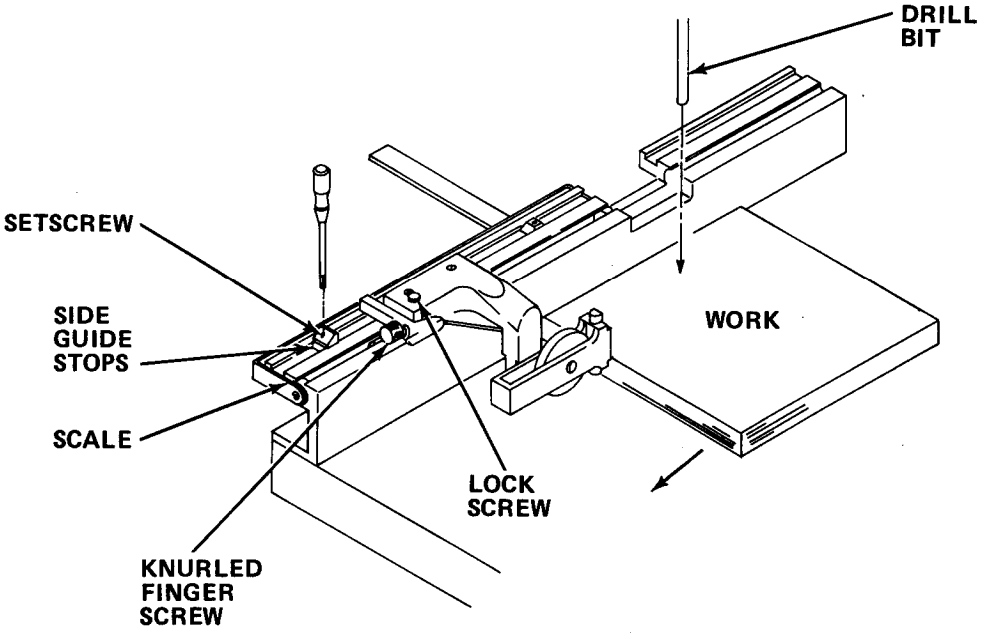
(1) Loosen two backgage lock screws under work surface that hold backgage.

(2) Move backgage to provide desired back margin.

(3) Line up backgage at left and right ends using scales.

(4) Tighten two backgage lock screws.

b. Set Side Guide Stops.



(1) Turn power off.

(2) Loosen setscrews and move side guide stops to positions that provide desired distance between holes.

NOTE

Use scale on backgage.

(3) Tighten setscrews.

(4) Adjust side guide for final centering by loosening lock screw and then turning knurled finger screw. (Turn left to decrease distance to drill bit or right to increase distance to drill bit.)

(5) Tighten lock screw.

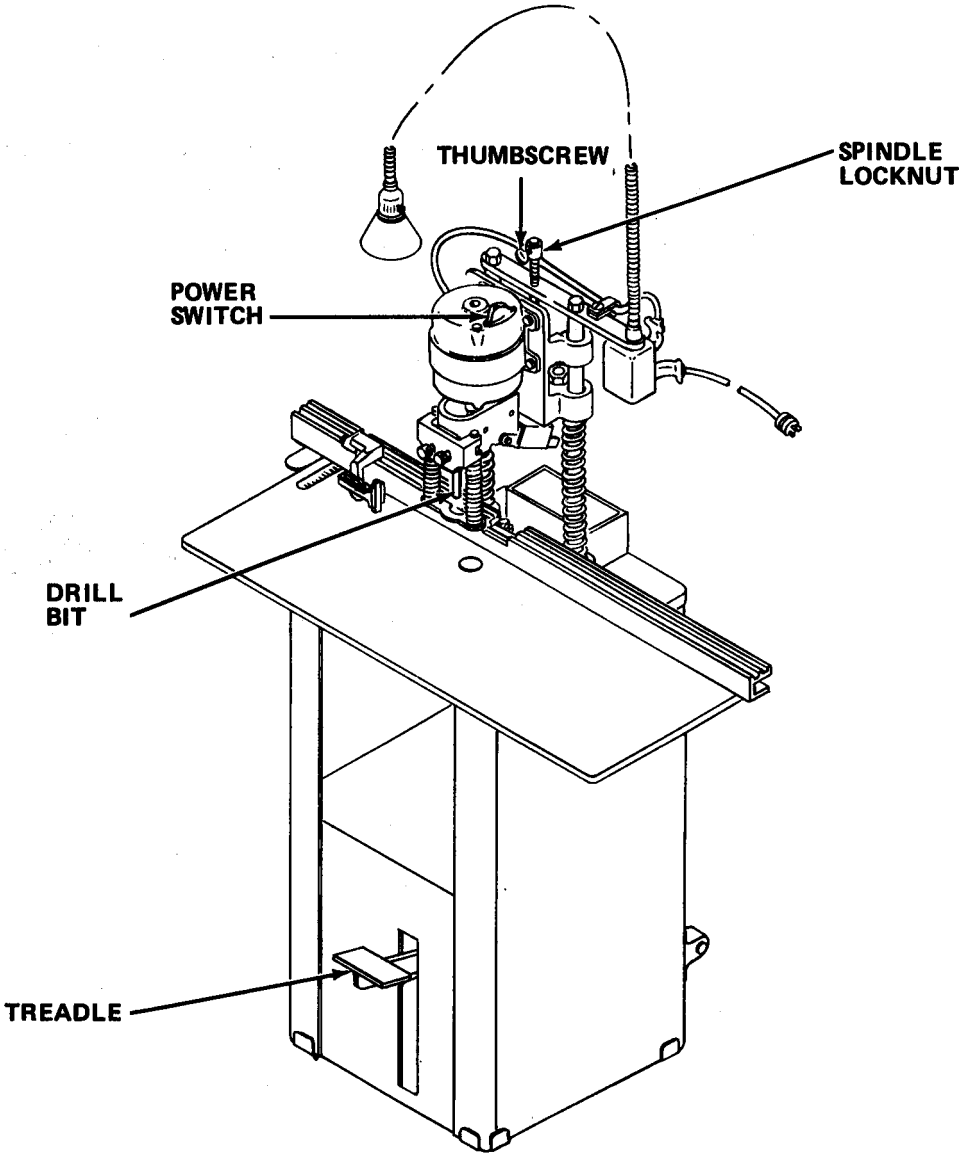
c. Adjust Vertical Stroke.

(1) Loosen thumbscrew in spindle adjusting locknut.

(2) Turn spindle locknut to right until spindle has maximum clearance.

(3) Push drill bit into spindle.

(4), Push treadle down gently until drill bit just contacts cutting block. Hold the treadle in position.



(5) Turn spindle locknut to right until free travel is removed from locknut. Tighten thumbscrew in spindle locknut.

(6) Release treadle.

(7) Test vertical stroke.

(a) Place single sheet of paper on work surface under drill bit.

(b) Press treadle down until drill bit contacts paper. Slowly release treadle.

(c) Check paper for proper drilling depth.

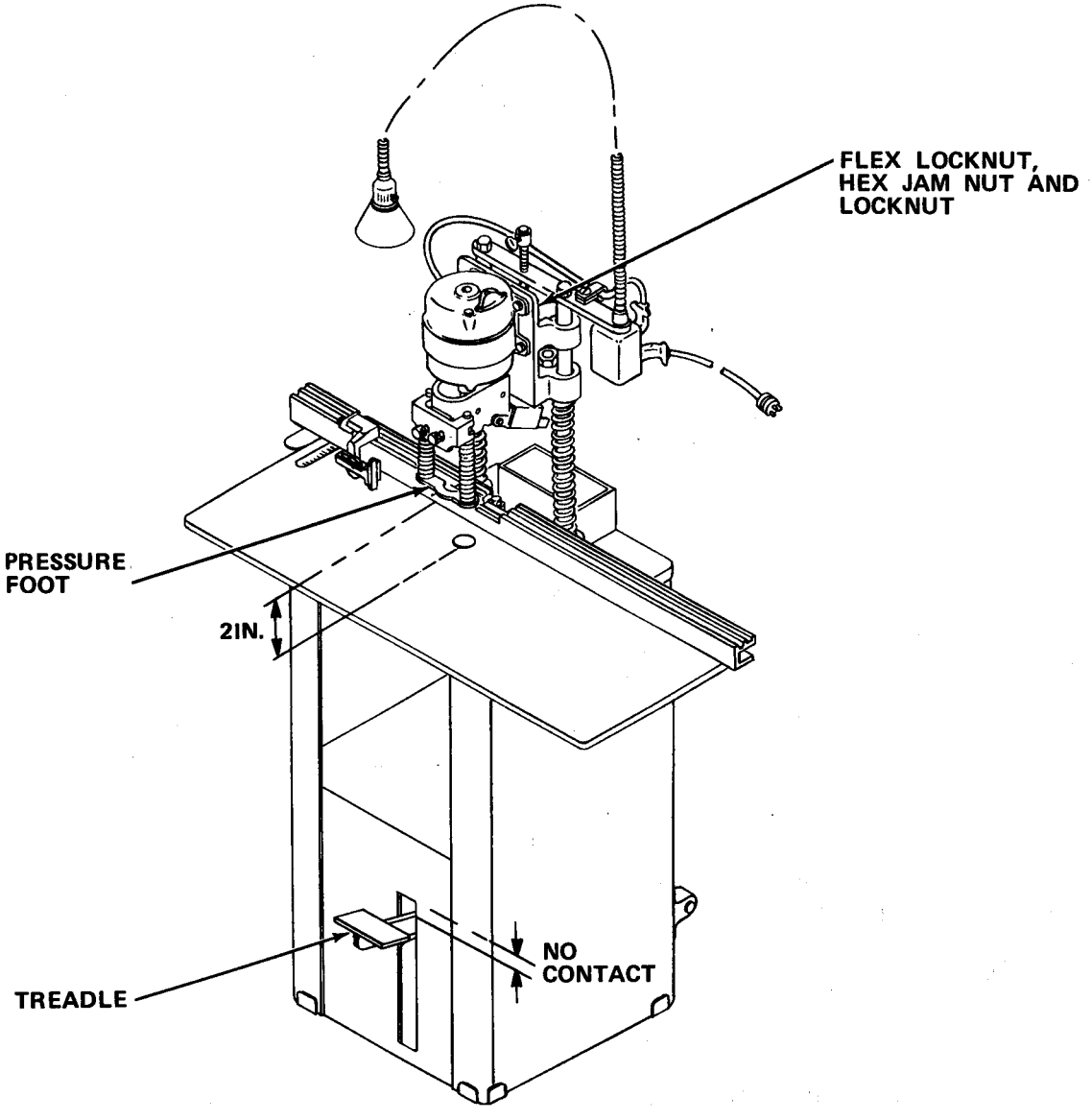
(d) Again, place single sheet of paper under drill bit.

(e) Place a 2 inch stack of scrap paper under the pressure foot, but not under the drill bit.

(f) Push treadle down and check to be sure pressure foot holds the stack firmly and the drill bit maintains the proper cutting depth.

(g) Check to be sure treadle does not contact frame.

d. Adjust Pressure Foot Clearance.



(1) Rotate flex locknut until pressure foot has 2 inch clearance from work surface.

(2) Lock hex jam nut down against motor bracket.

e. Test Drill.

(1) Place scrap paper stock under drill bit.

(2) Turn power on.

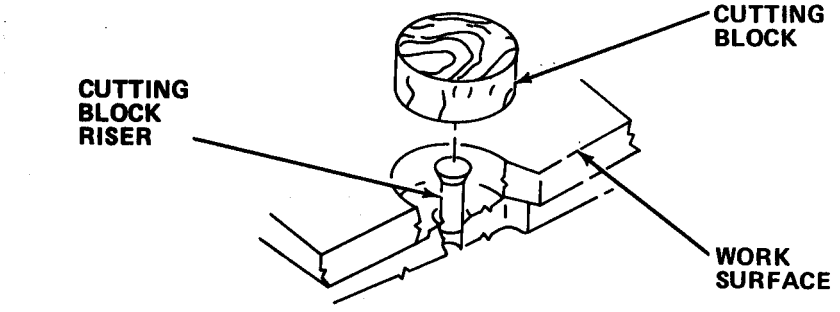
(3) Step on treadle and test drilling action.

NOTE

Drill must cut through bottom sheet without burning into cutting block.

(4) Readjust spindle locknut as required. Tighten thumbscrew.

f. Turn Cutting Block.



NOTE

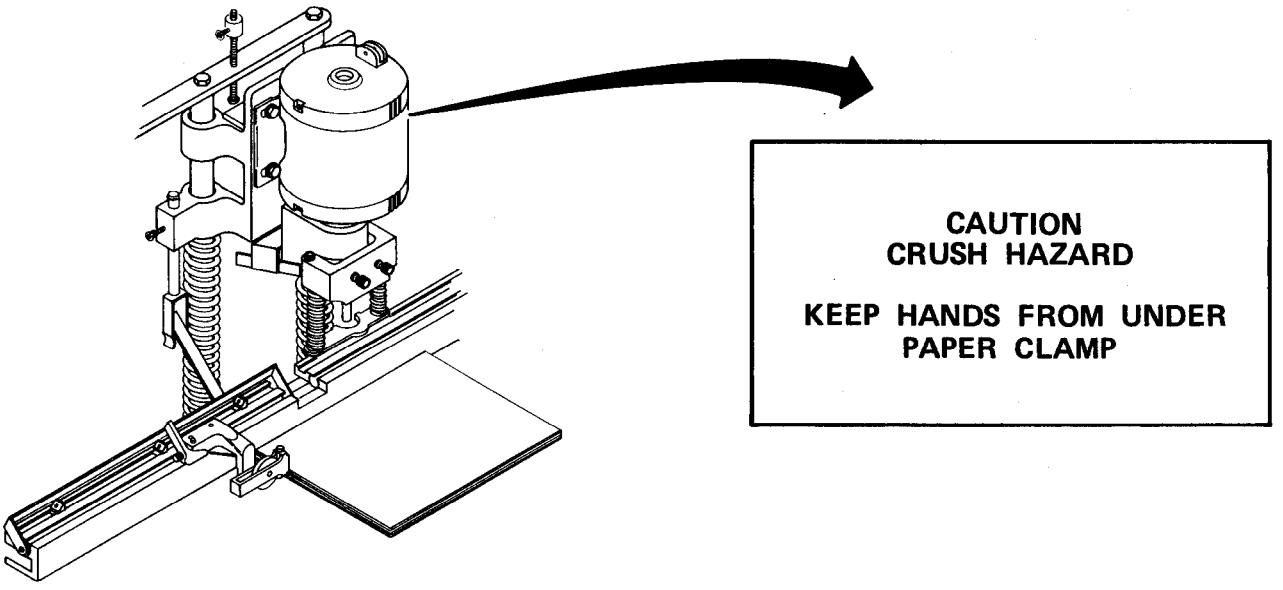
When both sides of cutting block are damaged, scarred, or burned, new block must be used.

(1) Push cutting block riser up to pop cutting block from work surface.

(2) Turn cutting block over so that clean, unnicked, or unburned side faces drill.

(3). Reinstall cutting block.

2-6.2 Operating Instructions on Decals and Instruction Plates.



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

Section III OPERATOR MAINTENANCE

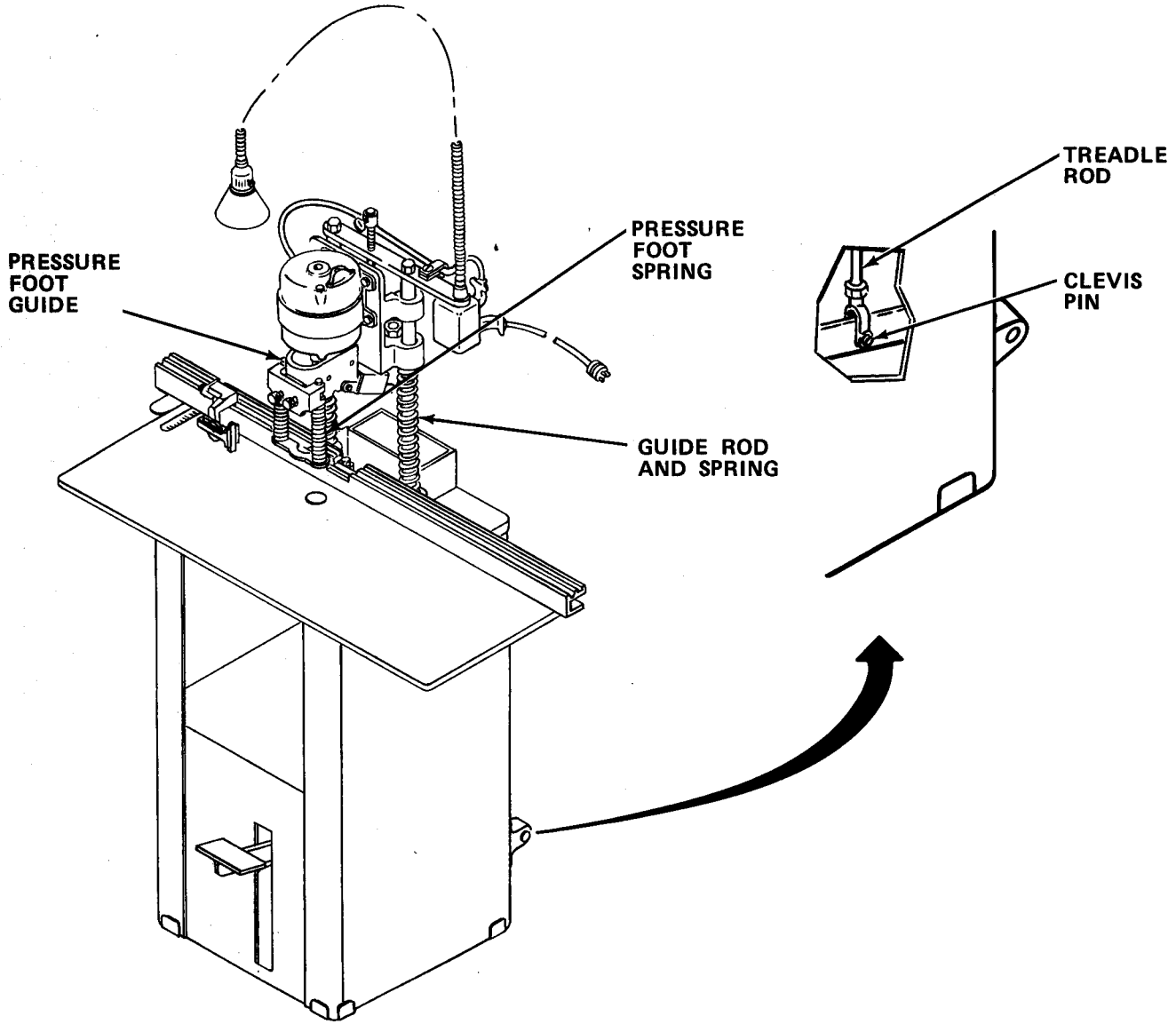
2-8. LUBRICATION INSTRUCTIONS.

NOTE

These lubrication instructions are mandatory.

2-8.1 Weekly Lubrication. Lubricate with silicone spray lubricant (Item 27, Appendix E) as follows:

a. Turn power off.



b. Lubricate the following points:

(1) Pressure foot guides.

(2) Pressure foot springs.

(3) Guide rod and spring.

(4) Clevis pin.

c. Wipe all machine parts and work surface clean.

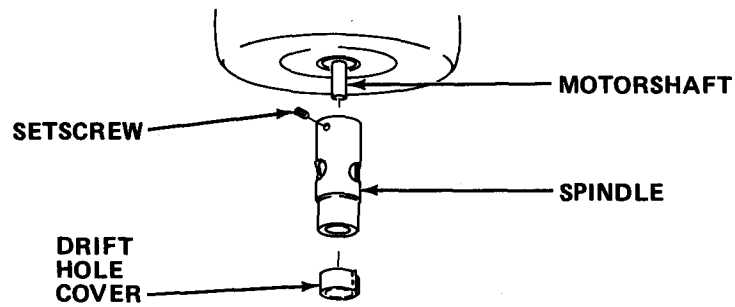
2-8.2 Monthly Lubrication. Lubricate spindle with silicone spray lubricant (Item 27, Appendix E) as follows:

a. Turn power off.

WARNING

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

b. Unplug power cord.



c. Raise drill to maximum height. (Loosen thumbscrew and turn spindle locknut fully to the right.)

d. Pull drift hole cover down and remove cover.

e. Insert drill drift into drift hole (round side down).

f. Lift up on drill drift.

NOTE

It may be necessary to tap bottom of drill drift to release drill.

g. Remove drill bit.

h. Lubricate spindle with silicone spray.

i. Reinstall drift hole cover.

j. Reinstall drill bit by pushing into spindle.

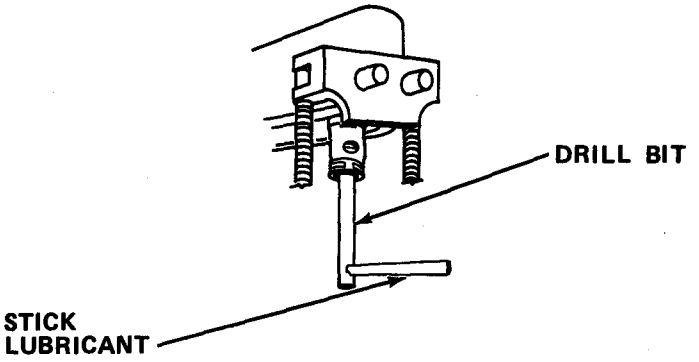
k. Clean excess lubricant from spindle and work surface.

l. Readjust vertical stroke (paragraph 2-6.1c).

m. Plug in power cord.

2-8.3 During Operation. Lubricate drill bit with stick lubricant (Item 15, Appendix E) as follows:

a. Turn power on.



NOTE

Lubricate only sides and cutting edge of drill bit.

b. Hold end of stick lubricant against rotating drill bit.

c. Drill through scrap paper to remove excess lubricant.

d. Turn off power.

2-9. TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during operation or maintenance of the paper drilling machine. 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. DRILLS PAPER TOO SLOWLY .	
Step 1. Inspect treadle linkage for dirt.	(a) If linkage is clean, proceed to step 2. (b) Clean and lubricate treadle linkage (paragraph 2-8.1).
Step 2. Inspect drill bit to be sure it is sharp.	Sharpen drill bit (Table 2-1).
2. DRILL HEAD WILL NOT RETURN TO UP POSITION.	
Manually lift head by pulling up on motor and examine springs and shafts.	(a) If springs are not broken, lubricate springs and shaft with general purpose oil. (b) Refer to organizational maintenance.
3. MOTOR WILL NOT TURN. WORK LIGHT NOT ILLUMINATED.	
Step 1. Check to see if 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 circuit breaker.	(a) Reset circuit breaker. (b) If problem still exists, refer to organizational maintenance.

Table 2-2. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
4. BROKEN DRILL BIT.
Step 1. Examine spindle for wobble.
(a) If spindle does not wobble, proceed to step 2.
(b) If spindle wobbles or is bent, refer to organizational maintenance.
Step 2. Examine broken drill bit to see if rust, dirt, residue, or lack of lubrication caused drill bit to break.
(a) Replace broken drill bit.
(b) Clean replacement drill bit (Table 2-1).
(c) Lubricate replacement drill bit (paragraph 2-8.3).

2-10. MAINTENANCE PROCEDURES. There are no operator maintenance procedures assigned for this equipment.

Section IV ORGANIZATIONAL MAINTENANCE

2-11. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication at this level of maintenance.

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 5-3610-253-24P covering organizational maintenance for this equipment.

2-13. SERVICE UPON RECEIPT.

2-13.1 Checking Unpacked Equipment.

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

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

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

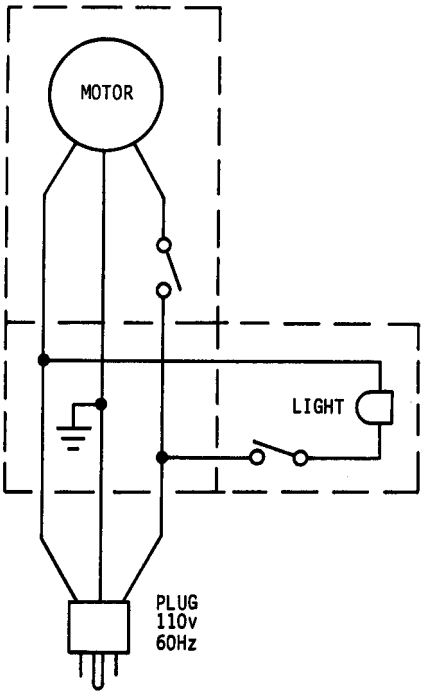
2-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES. There are no organizational PMCS procedures assigned for this equipment.

2-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES.

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 or foldout located at the end of this manual for further



d. If the paper drilling machine 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 2-3. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. DRILL HEAD WILL NOT RETURN TO UP POSITION.
Manually lift head up by pulling up on motor and inspect for broken lift spring(s).
Replace broken lift spring(s) (paragraph 2-16.1).

Table 2-3. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
2. DRILL HEAD WILL NOT COME DOWN.
Step 1. Check for foreign objects obstructing drill.
(a) If no obstruction is present, proceed to step 2.
(b) Remove obstruction.
Step 2. Inspect for disconnected treadle linkage.
Reconnect treadle linkage.
3. MOTOR WILL NOT TURN. LIGHT WORKS.
Step 1. Inspect connections to motor switch.
(a) If connections are properly made, proceed to step 2.
(b) Reconnect connections.
Step 2. Check power switch for continuity.
(a) If continuity is present, proceed to step 3.
(b) Replace power switch (paragraph 2-16.4).
Step 3. Check power cord from light junction box to motor.
Replace motor (paragraph 2-16.3).
4. MOTOR WILL NOT TURN, LIGHT WILL NOT WORK.
Step 1. Inspect connections at junction box.
(a) If connections are properly made, proceed to step 2.
(b) Reconnect connections.
Step 2. Inspect power cord for breaks and cracks.
Replace power cord (paragraph 2-16.2).

2-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance functions for the paper drilling machine. Personnel required are listed only if the task requires more than one.

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

INDEX

2-16.1 Replace Lift Spring.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 9/16 in. Combination Wrench
3/4 in. Combination Wrench

SUPPLIES: Lift Spring

a. Turn power off.

WARNING

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

b. Unplug power cord.

c. Loosen thumbscrew and turn spindle locknut all the way to the right.

d. Remove capscrews from guide rod bracket assembly.

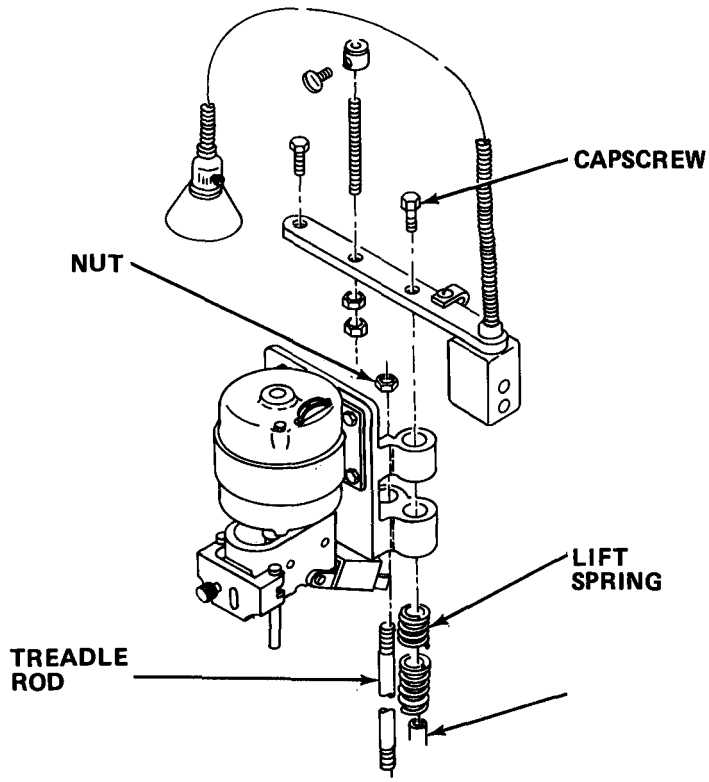
e. Remove top nut from treadle rod.

f. Remove motor bracket complete with motor and light.

g. Remove defective/broken lift spring.

h. Install new lift spring on guide rod.

i. Reinstall motor bracket on guide rod.



NOTE

Treadle rod fits in hole.

j. Reinstall capscrews.

k. Reinstall top nut on treadle rod.

l. Readjust vertical stroke (paragraph 2-6.1c).

m. Plug in power cord.

2-16.2 Replace Power Cord.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
Hand Wire Stripper
Crimping Tool

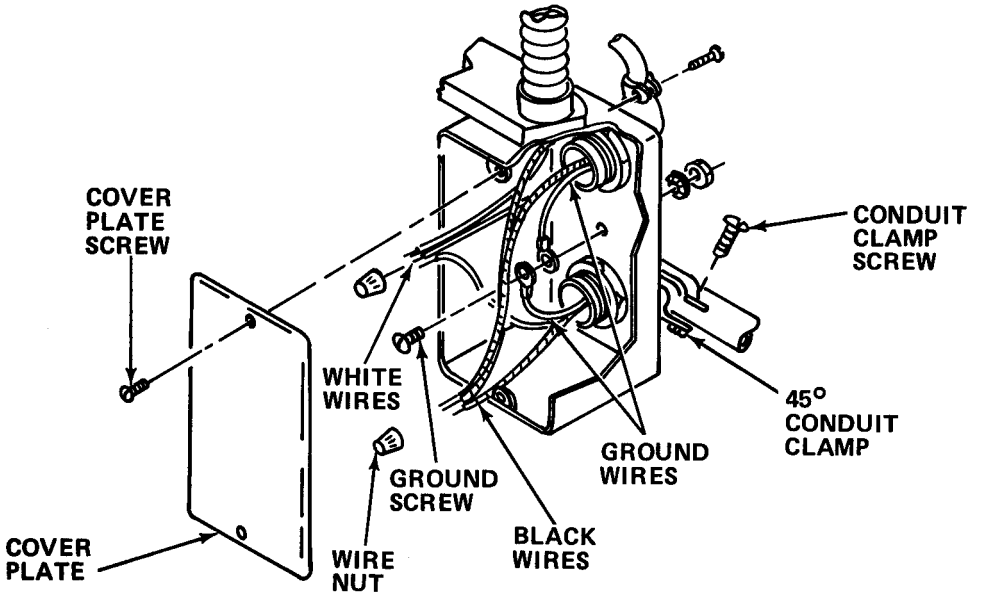
SUPPLIES: Wire Nuts
Power Cord
Eyelet

a. Turn power off.

WARNING

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

b. Unplug power cord.



c. Remove screws and cover plate from wire enclosure box.

d. Remove wire nuts.

e. Remove ground screw, power cord ground wire, and motor ground wire.

f. Loosen screws from 45 degree conduit clamp.

g. Pull defective power cord free from box.

h. Thread new power cord through 45 degree conduit into box.

i. Strip white and black wire ends approximately 3/8 in. (9.5 mm), and replace wire nuts (black wire to black wires; white wire to white wires).

j. Crimp eyelet on power cord around wire; reconnect power cord ground wire and motor ground wire with ground screw in back of box.

k. Pull slack from wires in box and tighten screws on conduit clamp.

1. Reinstall cover plate and secure with screws.

m. Plug in power cord.

2-16.3 Replace Motor.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 1/2 in. Combination Wrench
3/32 in. Hex Head Key Wrench
Crimping Tool
Flat Tip Screwdriver
Ball Peen Hammer
Punch Set
Hand Wire Stripper

SUPPLIES: Motor, Electric (1/4 HP)
Eyelets
Wire Nuts
Silicone Spray (Item 27, Appendix E)

WARNING

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

a. Unplug power cord.

b. Loosen thumbscrews and move auto-trip backgage out of the way.

c. Remove drift hole cover.

d. Remove drill bit using drill drift.

e. Remove thumbscrews and pressure foot.

f. Remove power cord tiedowns.

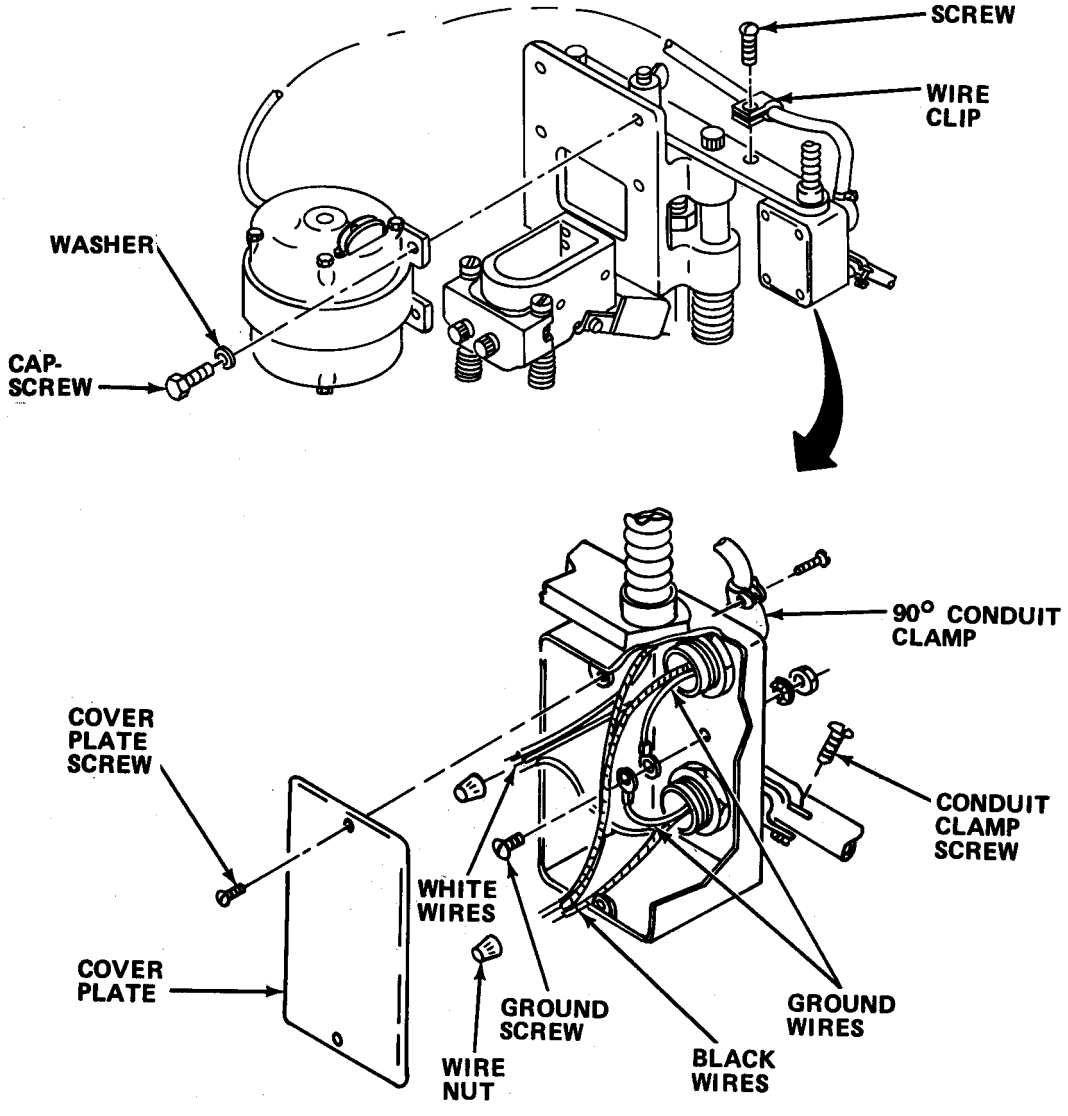
g. Remove screws and cover plate from wire enclosure box.

h. Remove wire nuts.

i. Remove ground screw, power cord ground wire, and motor ground wire.

j. Loosen screws from 90 degree conduit clamp.

k. Pull motor power cord free from box.



l. Remove motor mounting bolts and defective motor by raising motor up until spindle clears the spindle housing.

m. Place motor on its side on work surface.

n. Remove hex head locking screws on spindle.

o. Remove spindle from defective motor by pulling straight off the motor shaft.

p. Lubricate drive shaft on new motor with small amount of silicone spray.

q. Reinstall and aline spindle on new motor drive shaft and secure with hex head screws.

r. Install new motor and spindle in spindle housing and secure motor to mounting bracket.

NOTE

Shims may have to be placed behind motor mounting bracket to be sure motor is at a 90 degree angle to the cutting block and that the spindle does not bind on the spindle housing.

s. Thread new motor power cord through 90 degree conduit clamp.

t. Strip white and black wire ends about 3/8 in. (9.5 mm) and replace with wire nuts.

u. Crimp eyelet on new motor power cord ground wire if necessary. Connect power cord ground wire and motor ground wire with ground screw.

v. Pull slack from wires in box and tighten screws on conduit clamp.

w. Reinstall cover plate and secure with screws.

x. Reinstall motor power cord tiedowns.

y. Reinstall pressure foot and secure with thumbscrews.

z. Reinstall drift hole cover.

aa. Reinstall drill bit.

ab. Position and secure auto-trip backgage with thumbscrews.

ac. Plug in power cord.

2-16.4 Replace Power Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver, 1/4 in. Tip
Needle Nose Pliers
Flat Tip Screwdriver, 1/8 in. Tip

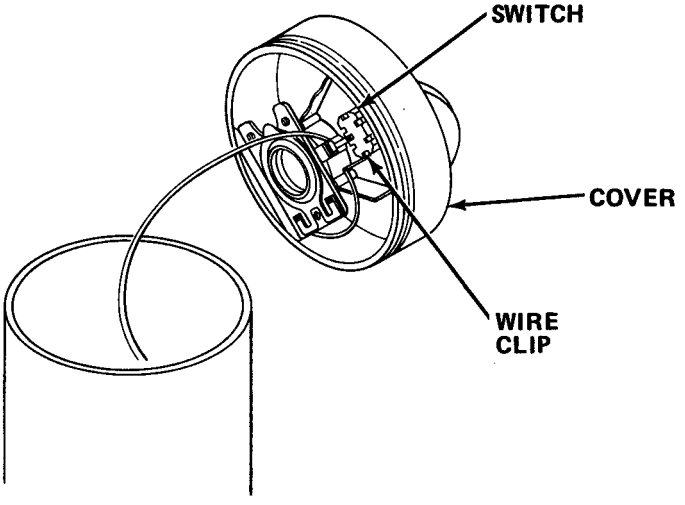
SUPPLIES: Switch

WARNING

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

a. Unplug power cord.

b. Remove bezel nut on power switch.



c. Remove motor lag bolts.

d. Remove top motor housing cover by slightly tapping up on cover.

e. Slide motor housing cover up until power switch can be carefully pulled out the side without damaging switch wiring.

f. Note position of wiring and. remove wire clips.

g. Replace wires on new switch and slide switch back into motor housing and switch guard. Secure with bezel nut.

h. Carefully slide motor cover down and secure with lag bolt.

i. Plug in power cord.

2-16.5 Relace Lamp.

MOS: 83FJ6, Reproduction Equipment Repairer

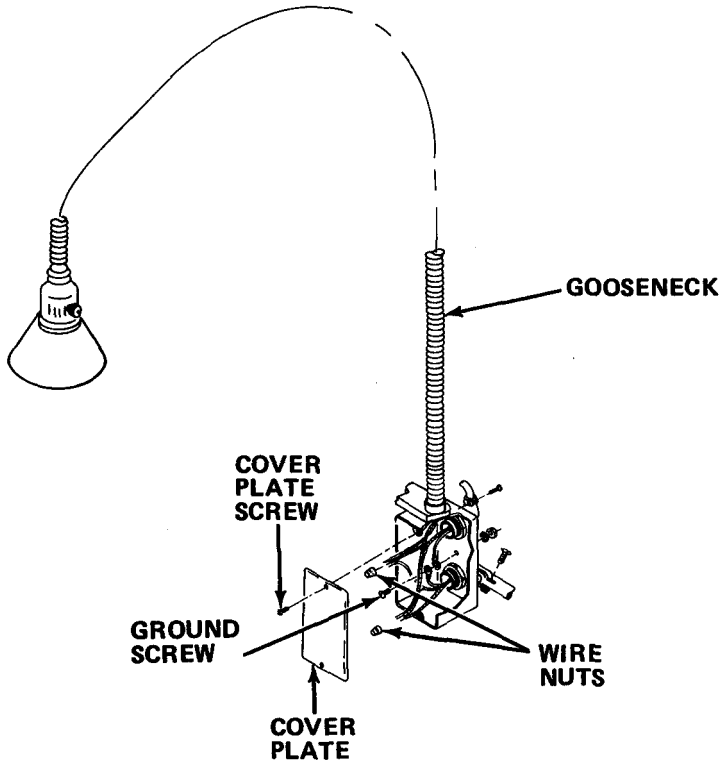
TOOLS: Flat Tip Screwdriver
Crimping Tool
Hand Wire Stripper
11/16 in. Combination Wrench

SUPPLIES: Lamp
Eyelets
Wire Nuts

a. Turn power off.

WARNING

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



b. Unplug power cord.

c. Remove cover plate screws and cover plate.

d. Unscrew wire nuts and separate wires.

e. Loosen bezel nut from gooseneck.

f. Unscrew gooseneck and lamp.

g. Unscrew bezel nut from defective gooseneck and lamp.

h. Thread bezel over lamp wires, screw onto new gooseneck, and install new gooseneck.

i. Connect wires with wire nuts (white to white and black to black).

j. Reinstall cover plate and secure with screws.

k. Plug in power cord.

2-16.6 Replace Spindle.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 1/2 in. Combination Wrench
3/32 in. Hex Head Key Wrench
Flat Tip Screwdriver
Ball Peen Hammer

SUPPLIES: Spindle
Silicone Spray (Item 27, Appendix E)

a. Turn power off.

WARNING

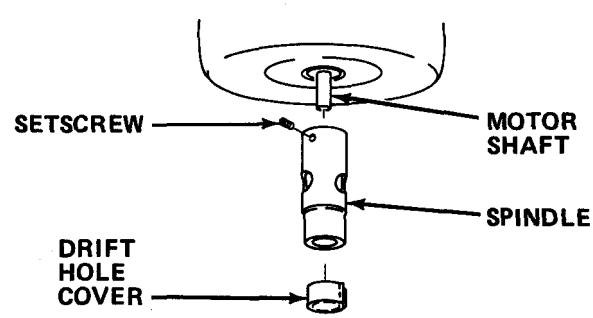
Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

b. Unplug power cord.

c. Loosen thumbscrews and move auto-trip backgage.

d. Remove drift hole cover.

e. Remove drill bit using drill drift.



f. Remove thumbscrews and pressure foot.

g. Remove motor power cord tiedowns.

CAUTION

Note position of motor in relation to mounting bracket. Use care when removing motor or damage to power cord and motor may occur.

h. Remove motor mounting bolts and motor by raising up and pulling spindle out of spindle housing.

i. Place motor on its side on work surface.

j. Remove hex head locking screws on spindle.

k. Remove defective spindle by pulling it straight off the motor drive

NOTE

Lubricate motor drive shaft with a small amount of silicone spray.

l. Install new spindle by pushing it straight on motor drive shaft.

m. Install hex head locking screws on spindle and lock to drive shaft.

n. Reinstall motor and spindle in spindle housing and secure motor to mounting bracket.

NOTE

If spindle appears to turn in a wobbling motion, or is not vertical to work surface, refer to previous note and step f. It may become necessary to use shims during mounting.

o. Secure motor power cord with tiedowns.

p. Reinstall pressure foot and secure with thumbscrews.

q. Reinstall drift hole cover.

r. Reinstall drill bit.

s. Position and secure auto-trip backgage with thumbscrews.

t. Plug in power cord.

2-16.7 Remove/Install Paper Drilling Machine.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required to perform this procedure.

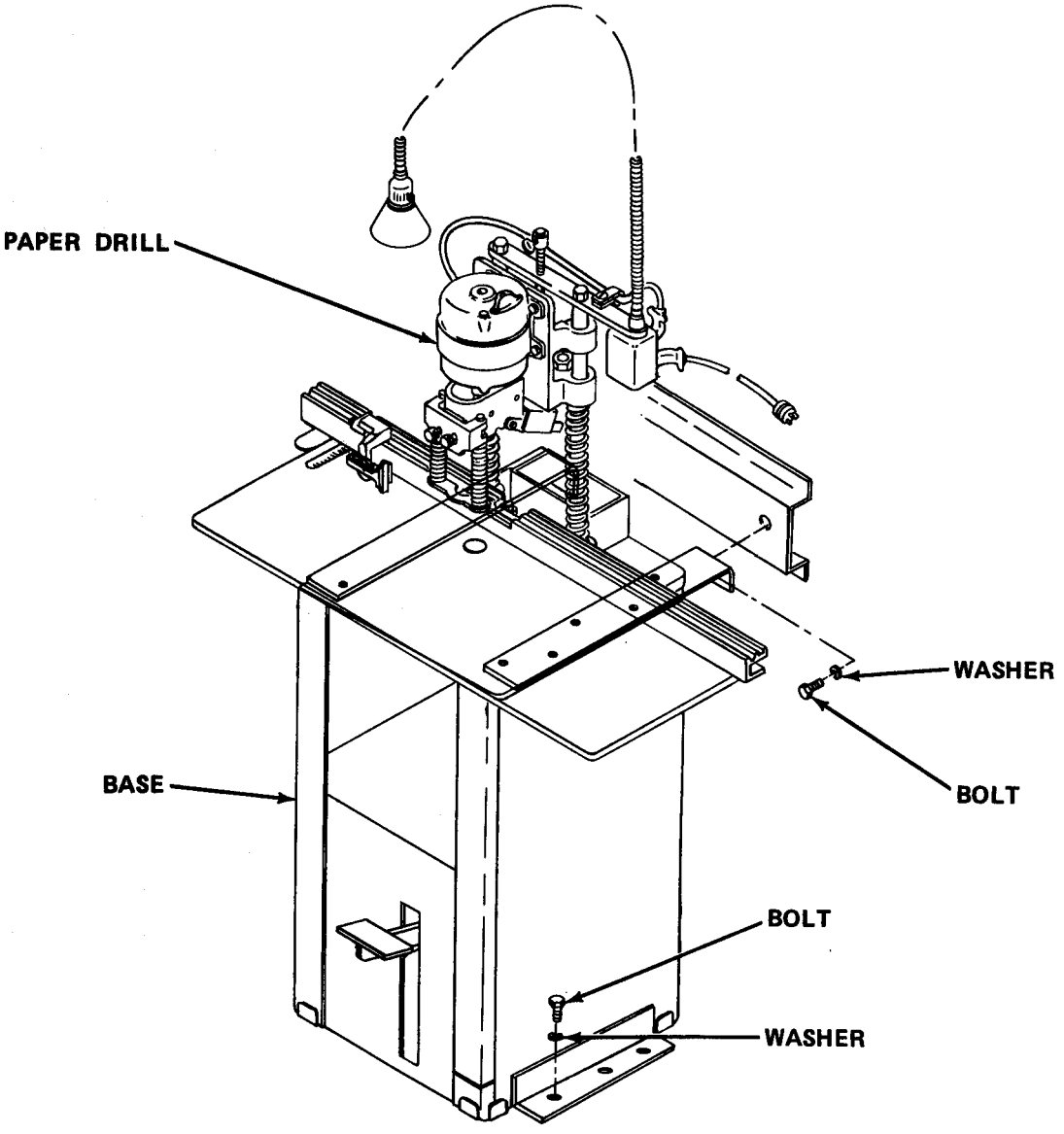
TOOLS: Socket Set, 1/2 in. Drive

SUPPLIES: Paper Drilling Machine

WARNING

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

a. Unplug power cord.



b. Remove bolts and washers securing paper drilling machine to floor.

c. Remove bolts and washers securing paper drilling machine to wall.

WARNING

Serious injury to personnel or damage to equipment may occur unless two or more personnel are used to remove or replace paper drilling machine because of weight and balance.

d. Remove paper drilling machine.

e. Replace paper drilling machine by alining over holes in floor.

f. Install washers and bolts holding paper drilling machine to floor.

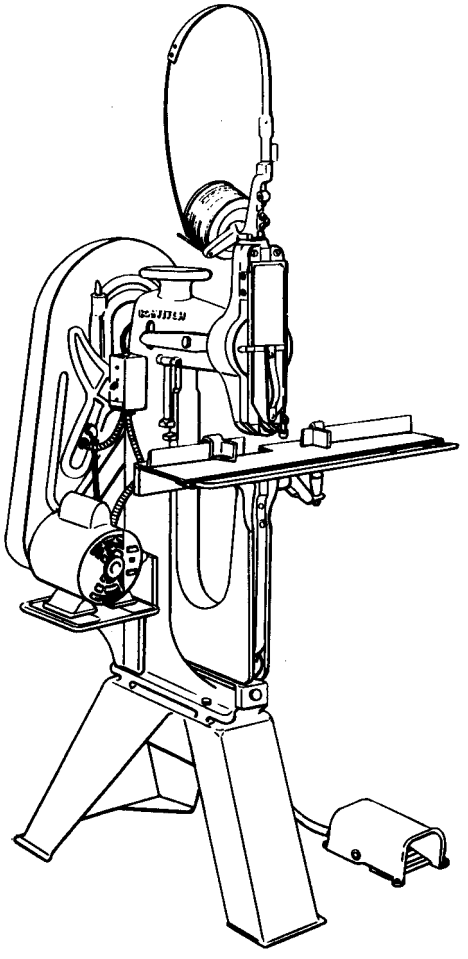
g. Install washers and bolts holding paper drilling machine to wall.

h. Plug in power cord.

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

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

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



CHAPTER 3

PAPER STITCHER

Section I INTRODUCTION

3-1. GENERAL INFORMATION.

3-1.1 Scope.

a. Model Number and Equipment Name. Model 7AW Paper Stitcher.

b. Purpose of Equipment. To serve as a light and heavy duty stitcher which will staple both flat and saddle work ranging in thickness from a few sheets to 7/8 in. (22.7 mm).

3-1.2 Reference Information.

a. Nomenclature cross-reference list.

Official Nomenclature	Common Name
Bind	Stitch.
Saddle Stitch	To stitch on fold so that staples are in spine or center of book or pamphlet.

3-2. EQUIPMENT DESCRIPTION.

3-2.1 Equipment Characteristics, Capabilities, and Features.

a. Binds flat and saddle work.

b. Electrically powered.

c. Foot-controlled, electrically operated clutch.

d. Adjusts for work thickness.

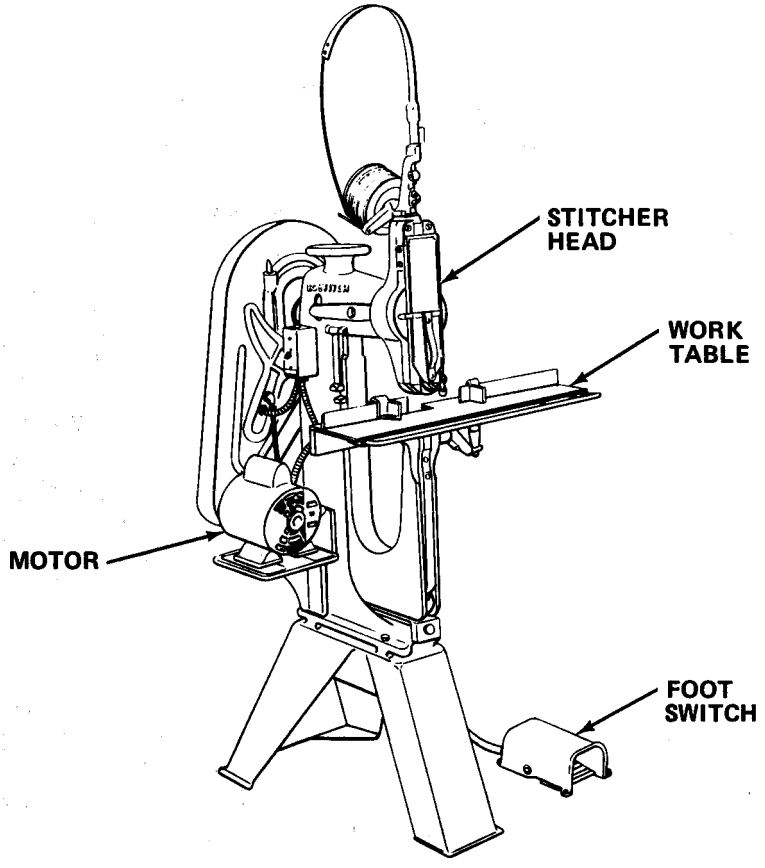
e. Uses round or flat wire.

f. Brake mechanism stops paper stitcher when foot control is released.

g. Operator has both hands free to position work.

h. Drive belt guard for safety.

3-2.2 Location and Description of Major Components.



STITCHER HEAD. Cuts, forms, and drives stitches.

WORKTABLE. Supports and alines work for saddle and flat work.

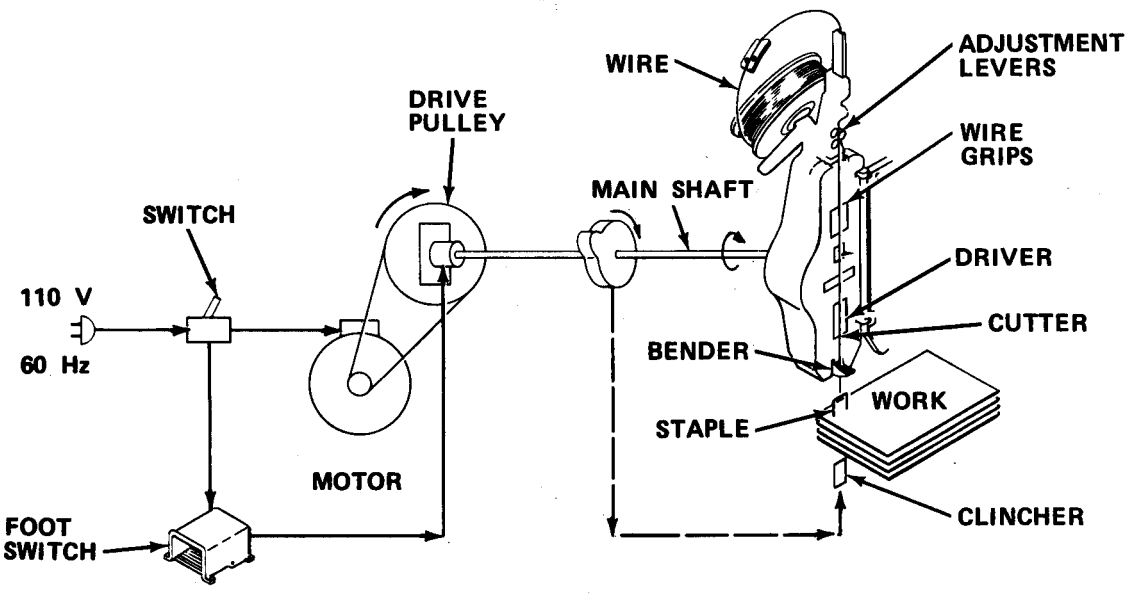
FOOT SWITCH. Activates stitching cycle.

MOTOR. Powers machine driving mechanism.

3-2.3 Equipment Data.

Power Requirements	115 V, 60 Hz, 5.8 amps
Maximum Thickness of Work	7/8 in. (22.23 mm)
Stitch Rate	125 stitches/rein
Wire	Gage
Round	24, 25, 26, 27, 28
Flat	20 x 24, 20 x 25, 21 x 25

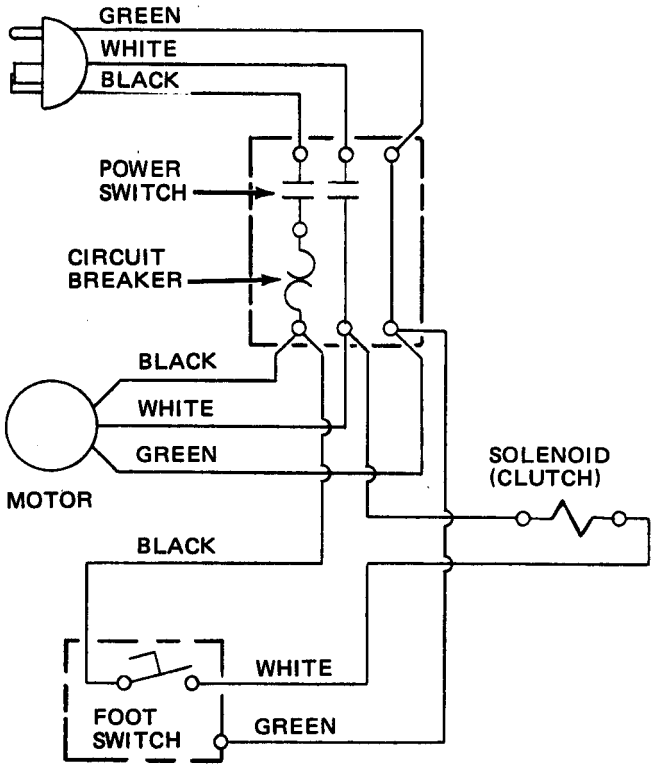
3-3. TECHNICAL PRINCIPLES OF OPERATION.



3-3.1 General. When power switch is turned on, motor starts. Depressing foot switch engages electrically operated clutch to rotate main shaft. Main shaft rotation drives stitcher head assembly. Wire grips pull wire through straighteners to remove bends. Cutter snips staple from bulk wire. Bender forms staple. Driver forces staple through work. Clinchers bend ends of staple.

3-3.2 Detailed.

a. Electrical System.



(1) Line voltage is controlled by power switch. Power switch provides circuit protection for motor, foot switch, and solenoid.

(2) When power switch is on, motor runs continuously, driving belt and pulley.

(3) Foot switch controls power to solenoid on clutch. Closing foot switch activates solenoid which releases clutch and engages main shaft. Main shaft rotates as long as foot switch is closed. Opening foot switch releases solenoid and main shaft stops.

b. Stitcher Head.

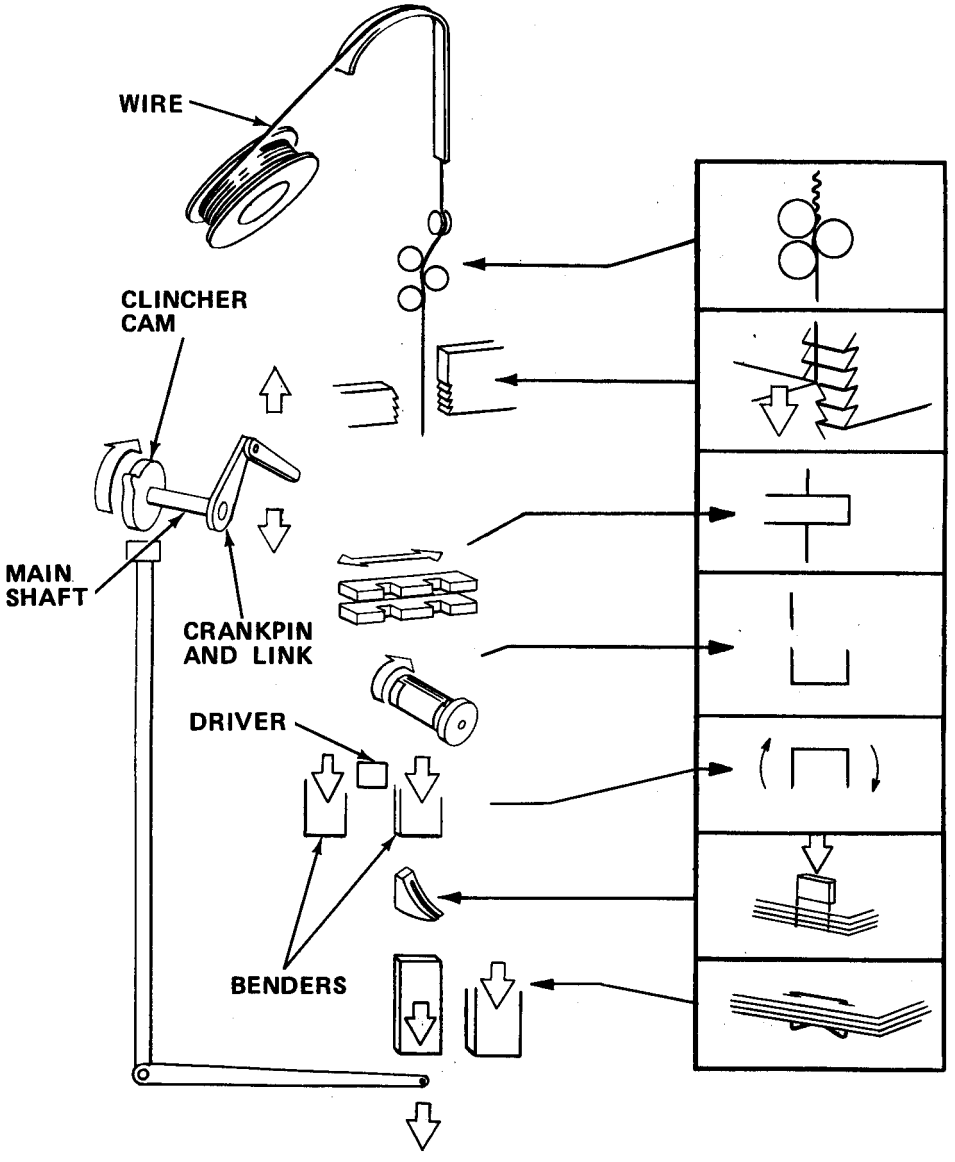
(1) Main shaft rotation is changed to up-and-down movement by crankpin and link to power stitcher head.

(2) Clincher cam on main shaft moves clincher up and down.

(3) Stitcher head forms and drives staples.

(a) Wire is pulled through straighteners to remove kinks.

(b) Wire grips draw wire down. Saw teeth prevent wire from moving backward.



(c) Cutter snips unformed staple from wire.

(d) Swivel rotates unformed staple,

(e) Bender forms staple shape.

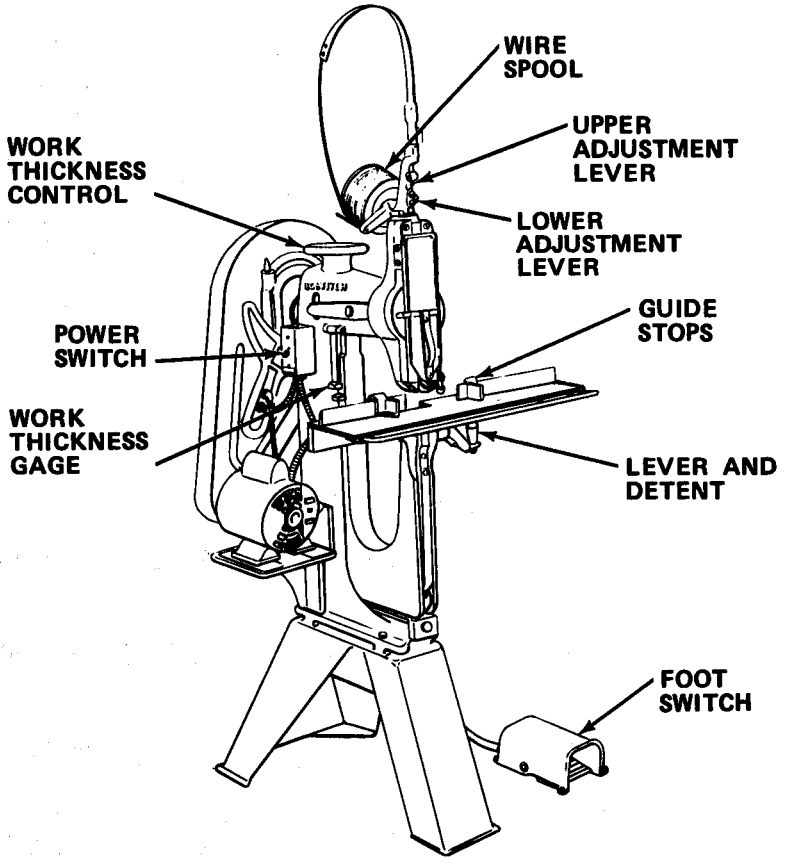
(f) Driver forces staple into work.

(g) Supporter supports staple as it is being driven downward and is pushed backward as staple enters work.

(h) Clincher bends ends of staples.

Section II OPERATING INSTRUCTIONS

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



Control or Indicator	Function
Work Thickness Control	Handwheel control to raise and lower thickness gage.
Wire Spool	Holds bulk wire.
Upper Adjustment Lever (Wire Straightener)	Straightens wire (in-out) .
Lower Adjustment Lever (Wire Straightener)	Straightens wire (left-right).
Guide Stops	Position work for stitching.
Lever and Detent	Locks work table in flat or saddle position.
Foot Switch	Controls paper stitcher operation. Stitcher drives staples as long as foot switch is depressed.
Work Thickness Gage	Measures thickness of stock to be stitched.
Power Switch	Turns stitcher on and off.

3-5. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES.

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

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

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

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

3-5.1 PMCS Procedures.

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

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

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

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

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

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

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

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

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

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

Item	Quantity
Cross Tip Screwdriver	1 ea
Flat Tip Screwdriver	1 ea
Deleted.	
Cheesecloth (Item 6, 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 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
Bl - Biennially

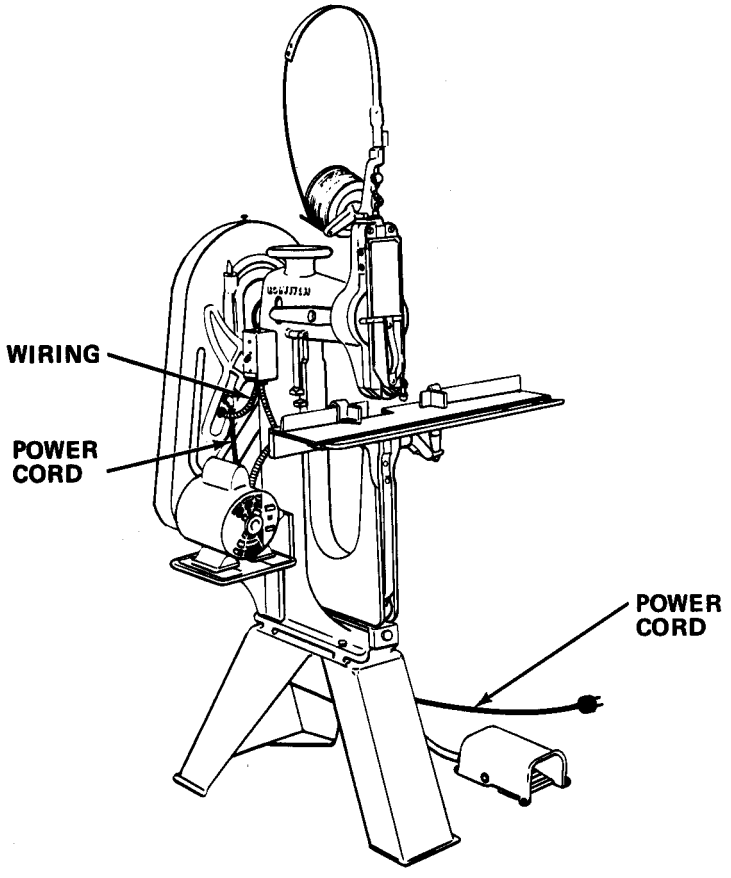
(Number)- Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER STITCHER	
1	W	Inspect.	
		WARNING Death or serious injury may occur from electrical shock unless power cord s unplugged before servicing.	
		1. Unplug power cord.	
		2. Inspect wiring for frays, kinks, burns, or other damage.	Wiring is defective.

Table 3-1. 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:
		PAPER STITCHER - Cont	
1	W	Inspect - Cont	



3. Inspect stitcher for loose screws and bolts. Tighten as required.

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

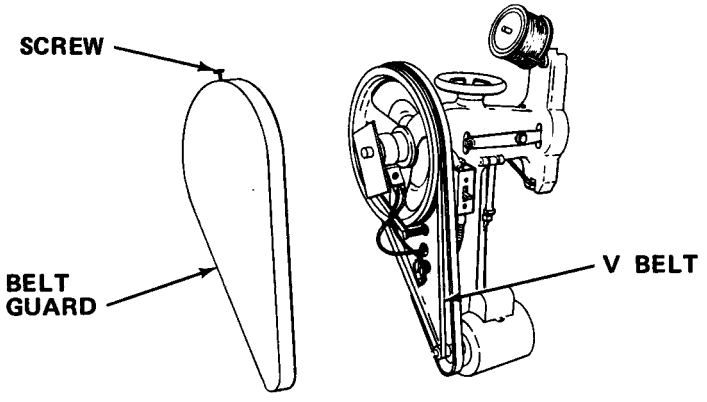
B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

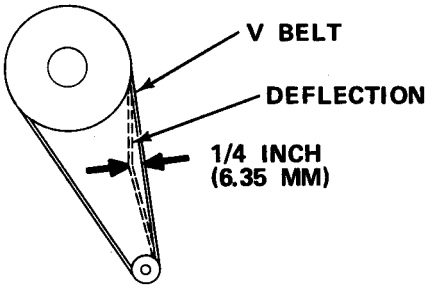
AN - Annually
S - Semiannually
Bi - Biennially

(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER STITCHER - Cont	
1	W	Inspect - Cont	



4. Remove screw on top of rear belt guard and remove guard.



5. Inspect V-belt for fraying or excessive wear.

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 Bl - Biennially | (Number) - Hundreds of Hours

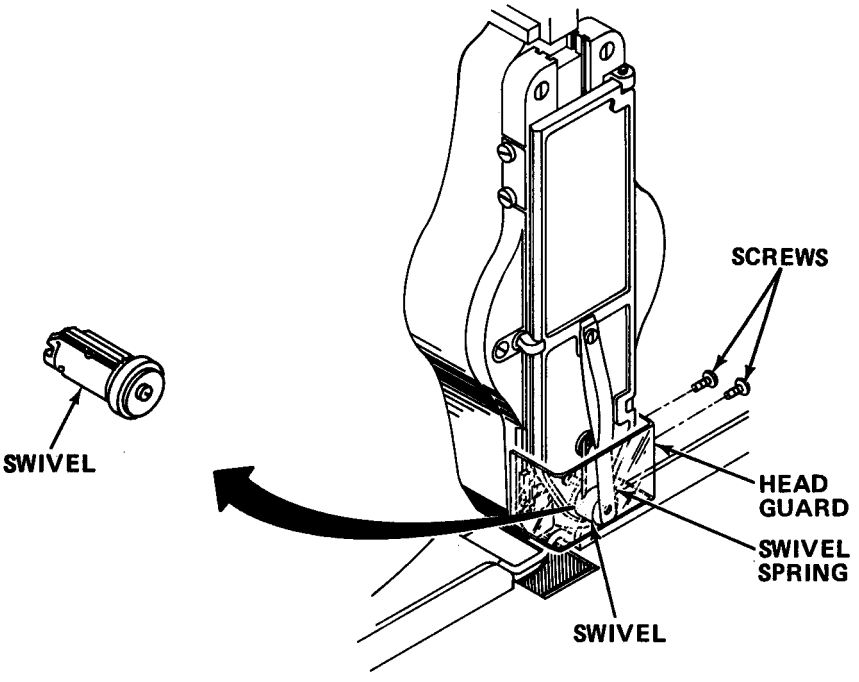
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER STITCHER - Cont	
1	W	Inspect - Cont	
		6. Check V-belt tension. Deflection at center of belt should be approximately 1/4 in. (6.35 mm).	Deflection is over 1/2 in. .(12.7 mm).
		7. Reinstall screw and rear belt guard.	
			
		8. Remove two screws and stitcher head guard.	
		9. Lift swivel spring and move to side.	
		10. Withdraw swivel from swivel bushing.	

Table 3-1. 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 - Biannually

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER STITCHER - Cont	
1	W	Inspect - Cont	
		11. Examine swivel for dirt or damage.	Swivel is damaged.
		12. Clean swivel with hand wire brush.	
		13. Reinstall swivel in swivel bushing.	
		14. Move swivel spring so end covers swivel.	
		15. Reinstall stitcher headguard and secure with screws.	
		16. Wipe all work surfaces clean with clean cheesecloth.	
		17. Plug in power cord.	

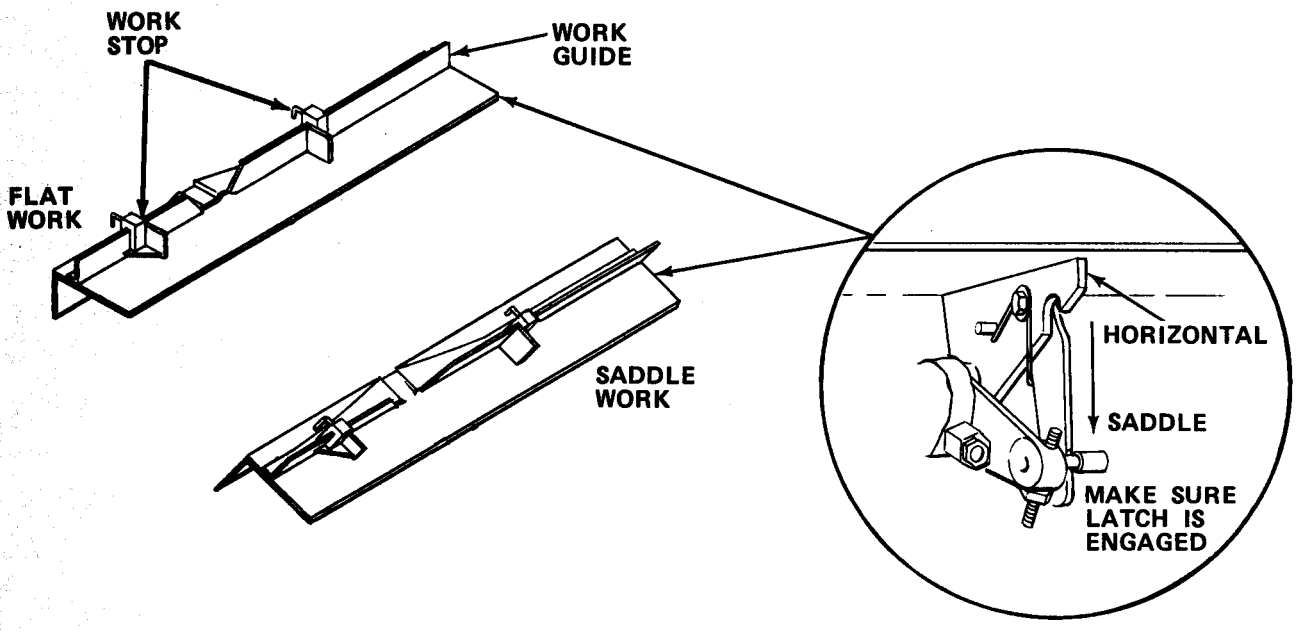
3-6. OPERATION UNDER USUAL CONDITIONS.

3-6.1 Operating Procedures.

a. Adjust work table. Position latch to hold table in horizontal position for flat work or tilted forward for saddle work.

NOTE

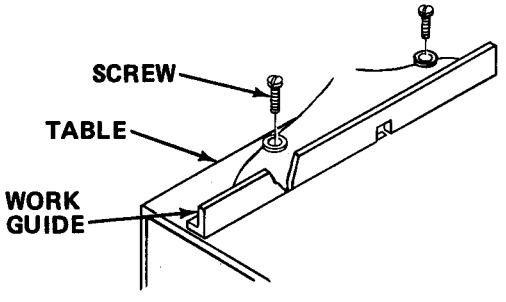
Be sure that latch is engaged in notches to hold the table.



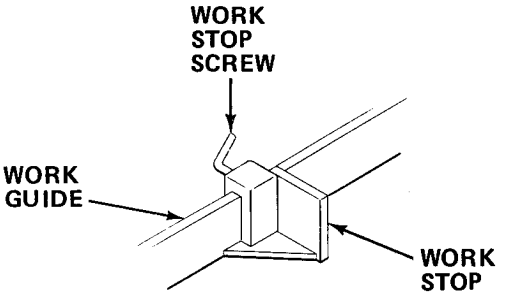
b. Position work guide.

(1) Remove work guide from side of machine by removing two screws.

(2) Position work guide on table.



(3) Secure with same two screws.



(4) Position work stops.

(5) Secure work stops by tightening work stop screws.

c. Choose wire gage and driver.

Table 3-2. WIRE GAGE/DRIVER CHART

Type of Work	Wire Gage	Driver
SADDLE AND LIGHT FLAT	24 Round 25 Round 26 Round 27 Round 28 Round 21 x 25 Flat	7089E
FLAT (LIGHT)	24 Round 25 Round 26 Round 27 Round 28 Round	7089E
FLAT (HEAVY)	20 x 24 Flat 20 x 25 Flat 21 x 25 Flat	7089F

d. Change Driver (if required).

WARNING

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

(1) Unplug power cord.

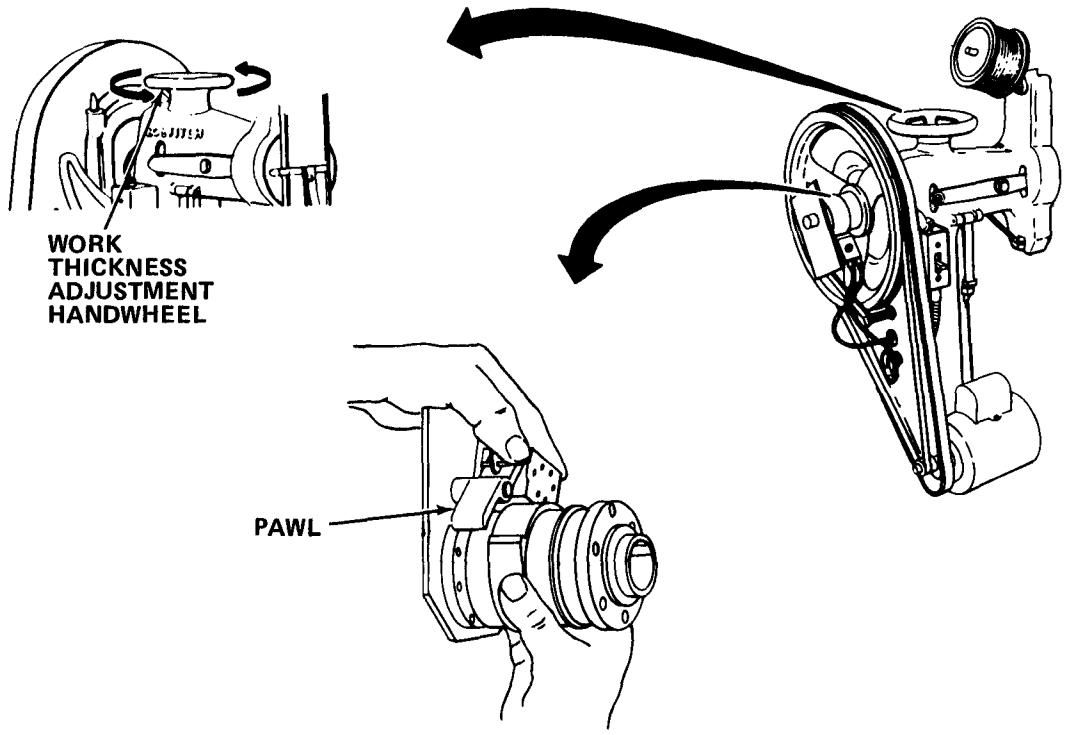
(2) Turn work thickness adjustment handwheel to left until handwheel tension is relieved.

CAUTION

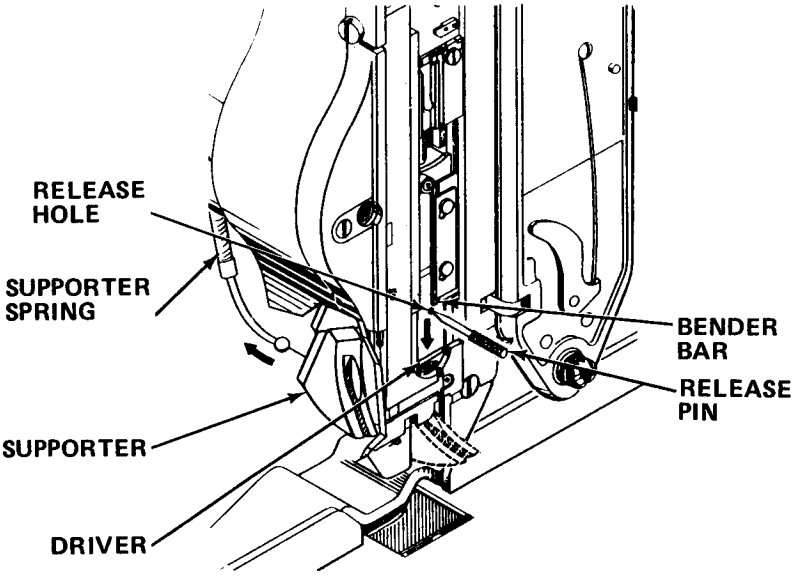
If force is used in closing stitcher head door, the stitcher will be damaged. If door binds, manually depress supporter until the swivel clears supporter and the door will close.

(3) Push stitcher door latch to right and open door.

(4) Loosen screw on belt guard and remove guard.



(5) Lift pawl to engage clutch and release brake.



(6) Pull supporter spring rod free from supporter.

(7) Rotate drive pulley to the right until release hole in drive is visible.

(8) Insert driver release pin in release hole in driver.

(9) Push driver release pin in and push driver from bottom of bender bar.

(10) Change driver.

(11) Insert driver in bottom of bender bar; then slide upward until driver stops.

(12) Depress tension spring with release pin and slide driver until it clicks into place.

(13) Reconnect supporter spring.

(14) Lift pawl to engage clutch and release brake; then manually rotate pulley at least twice to be sure head operates freely.

(15) Reinstall belt rear guard and tighten screw.

CAUTION

If force is used in closing stitcher door, the stitcher will be damaged. If door binds, manually depress supporter until the swivel clears support and the door will close.

(16) Close stitcher door.

(17) Plug in power cord.

e. Thread wire.

WARNING

To prevent injury to personnel do not open stitcher head, thread wire, or make adjustments until power cord is unplugged.

(1) Unplug power cord.

(2) Loosen screw on back belt guard and remove guard. (Removal of belt guard is necessary to gain access to large pulley.)

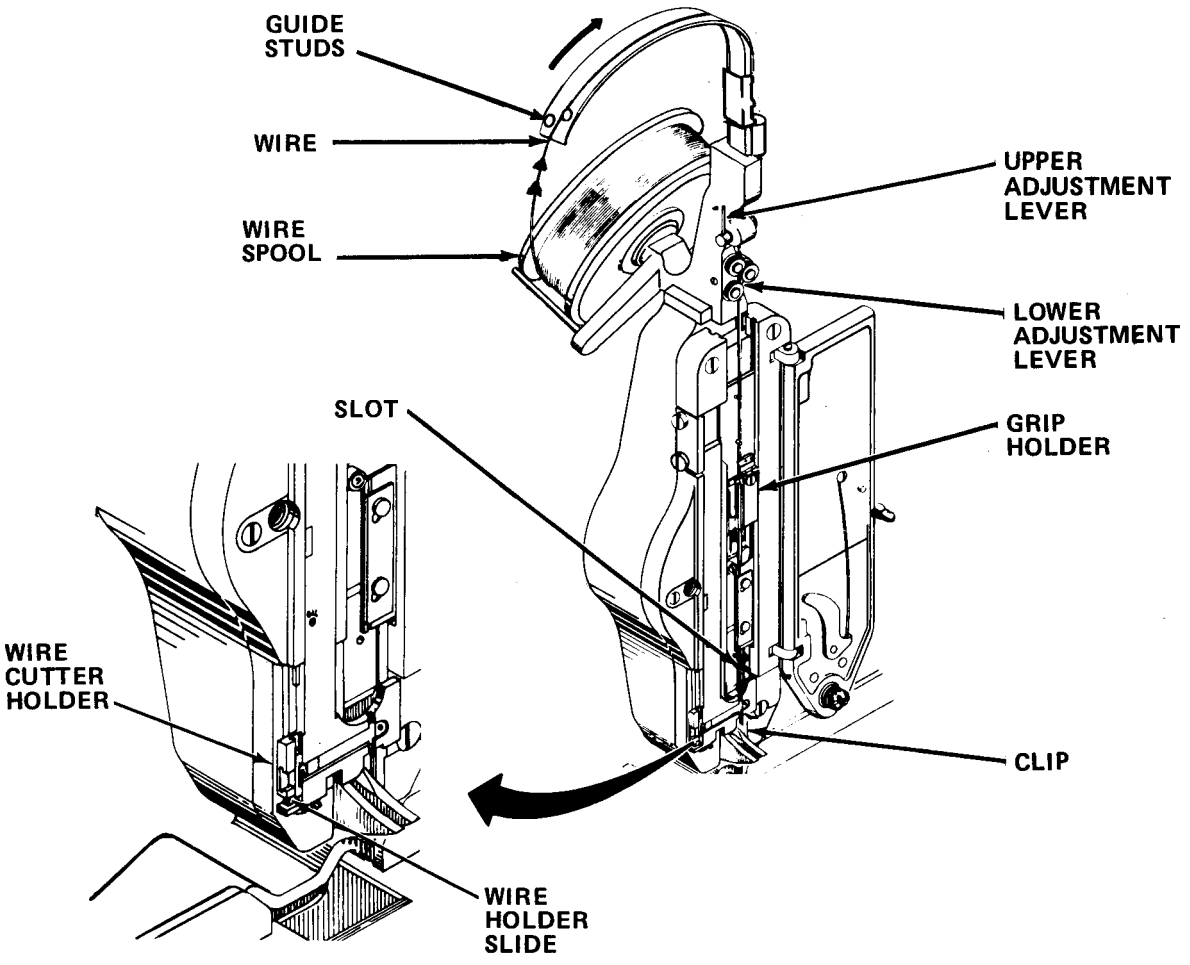
CAUTION

If force is used in closing stitcher head door, the stitcher will be damaged. If door binds, manually depress supporter until the swivel clears supporter and the door will close.

NOTE

Be sure stitcher head is at top of stroke.

(3) Open stitcher head door.



(4) Place wire spool on spindle.

(5) Pass wire over guide spring between guide studs.

(6) Thread wire through wire oiler felt retainer and slide wire into slot in the felt.

(7) Thread wire behind upper adjustment lever through lower adjustment 1 ever.

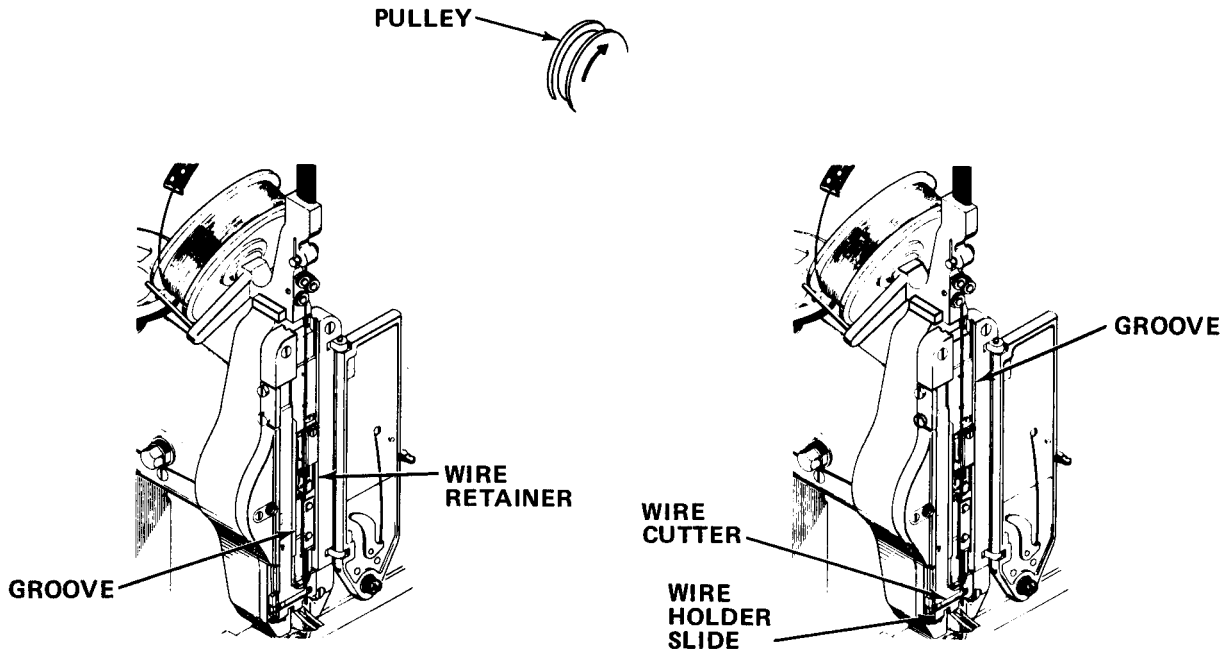
(8) Pull wire until it extends past wire cutter holder.

(9) Pass end of wire behind clip.

(10) Push grip holder to the left and place wire between wire grips.

(11) Push wire retainer to right.

(12) Lay wire in slot. Move wire retainer to cover slot.



(13) Push wire holder slide to the left.

NOTE

Be sure slots in upper wire cutter are lined up with slot in wire holder slide.

(14) Lay wire in slot. Release wire holder slide to cover slot.

(15) Release pawl to engage clutch and release brake.

(16) Manually rotate drive pulley to right until wire grips draw wire downward.

(17) Continue rotation of pulley until wire cutters operate.

(18) Stop rotation at top of stroke.

CAUTION

If force is used in closing stitcher head door, the stitcher will be damaged. If door binds, manually depress supporter until the swivel clears supporter and the door will close.

(19) Push support down and close stitcher head door.

(20) Reinstall rear belt guard and tighten screw.

(21) Plug in power cord.

f. Adjust thickness.

(1) Turn work thickness adjustment handwheel to left until column gage has risen enough to insert work easily between gage and gage shelf.

(2) Insert work between gage and gage shelf.

(3) Turn work thickness control to the right until work is firmly clamped. Turn to the left enough to allow work to be pulled free with only slight drag.

g. Stitch.

WARNING

Serious injury may occur unless hands are kept free of stitcher head when operating stitcher.

(1) Turn power on.

(2) Place work in position under stitcher head with both hands well clear of head.

(3) Place toe in foot switch and push down twice to drive one staple.

(4) Examine staple. If staple is not correct, refer to Table 3-3.

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.

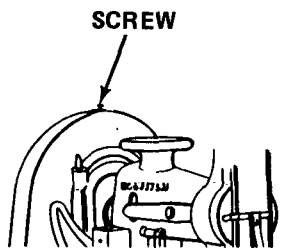
NOTE

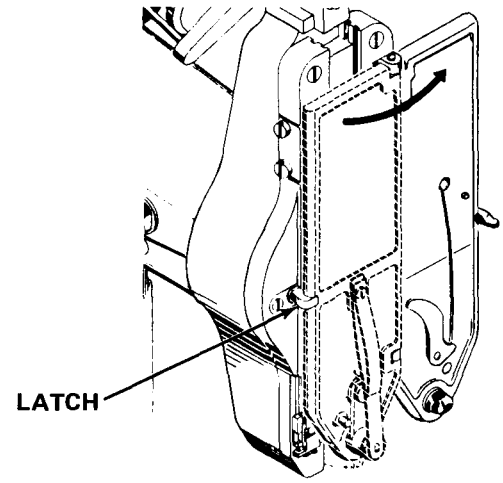
These lubrication instructions are mandatory.

3-8.1 Weekly Lubrication.

WARNING

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





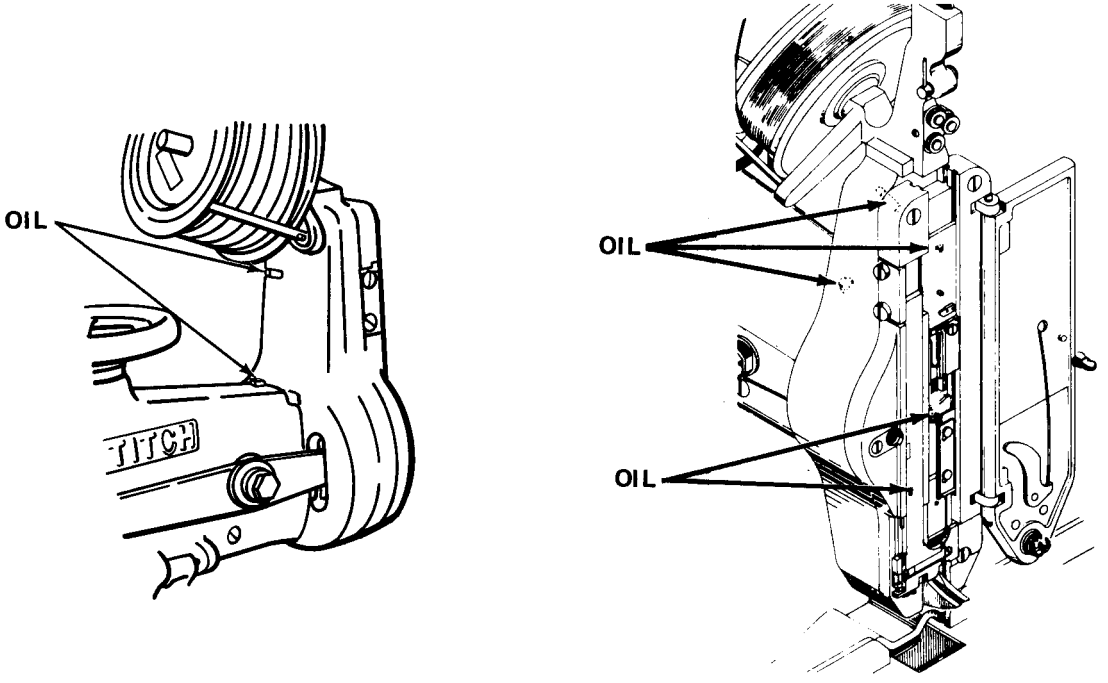
a. Unplug power cord.

CAUTION

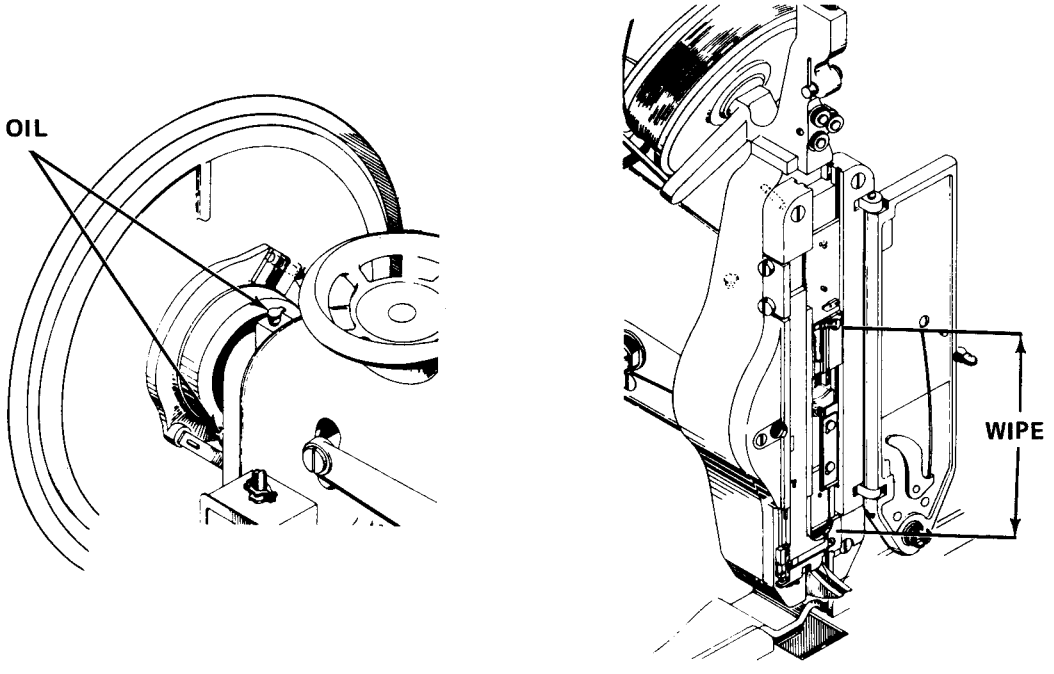
If stitcher head door is forced open or closed, stitcher mechanism may be damaged.

b. Move door latch to right and open stitcher head door.

c. Remove screw on top of rear belt guard and remove guard.



d. Apply 1 drop of oil (Item 16, Appendix E) to points indicated in illustration.



e. Moisten cotton swab (Item 7, Appendix E) with oil (Item 16, Appendix E) and wipe the moving parts indicated in illustration.

f. Wipe all excess oil from stitcher surfaces.

CAUTION

If force is used in closing stitcher head door, the stitcher will be damaged. If door binds, manually depress supporter until the swivel clears supporter and the door will close.

g. Close stitcher head door.

h. Reinstall belt rear guard and tighten screw.

i. Plug in power cord.

3-9. TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during operation or maintenance of the paper stitcher. 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 3-3. TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. STITCHER DOES NOT OPERATE. MOTOR DOES NOT TURN.
Step 1. Check to see if power cord is unplugged.
(a) If power cord is plugged in, proceed to step 2.
(b) Plug in power cord.
Step 2. Check power switch to see if thermal relay on switch tripped.
(a) If relay is not tripped, proceed to step 3.
(b) Reset power switch.
Step 3. Check circuit breaker in power panel.
(a) Reset circuit breaker.
(b) Refer to organizational maintenance.

Table 3-3. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
2. STAPLE NOT FORMED CORRECTLY. Compare staple to Table 3-4 or Table 3-5. Perform corrective action indicated in Table 3-4 or Table 3-5.

Table 3-4. STAPLE-FORMING CHART

Staple

Perfect Staple

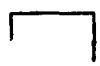
Trouble	Probable Cause	Corrective Action
 Right leg is short.	Cutter is not properly adjusted in relation to swivel.	(1) Shorten left leg to same length as right leg (paragraph 3-10.5). (2) Adjust both legs to desired length (paragraph 3-10.5).
 Left leg is short.	Clogged or worn grip.	(1) Clean grip. (2) Check grip teeth. If worn, replace or reverse (paragraph 3-10.2).
	Left leg feed is not adjusted correctly.	Adjust length of left leg (paragraph 3-10.5).
 Staple corner is buckled.	Chipped or broken driver.	Check driver ends for damage. Reverse or replace (paragraph 3-10.3).

Table 3-4. STAPLE-FORMING CHART - Cont

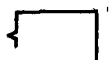
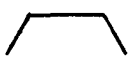
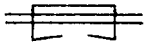
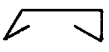
Staple	Trouble	Probable Cause	Corrective Action
Perfect Staple			
	One or both legs are buckled.	Wrong size wire for work.	Check wire size. Change wire as required.
		Dull wire cutters.	Check wire cutters. Reverse or replace (paragraph 3-10.1).
	Bent crown.	Wrong size wire for work.	Check wire size. Change wire as required.
		Supporter retracts too easily.	Check supporter spring tension. Increase tension or replace spring (paragraph 3-10.6).
	**Staple is partially formed.**	Worn driver bar latch.	Replace driver bar latch (paragraph 3-16.2).
	Left leg is missing.	Wire slipping in grip.	Clean grip. Reverse or replace grip (paragraph 3-10.2).
	Right leg is missing,	Corner of swivel too sharp.	Check swivel. If necessary, round corner with file or stone (paragraph 3-16.4).
	Staple comes out in pieces.	Swivel sticking.	Clean and lubricate swivel (paragraph 3-8).
		Corner of swivel too sharp.	If corners are too sharp, round corners with file or stone (paragraph 3-16.4).
	Corners of staple broken or nearly cut thru.	Wire too hard	Use proper wire.
		Corner of swivel too sharp	Check swivel and round sharp corner (paragraph 3-16.4).
	Corners of staple rounded.	Worn swivel	Replace swivel (paragraph 3-16.4).

Table 3-5. DRIVEN AND CLINCHED STAPLES

Staple	Trouble	Probable Cause	Corrective Action
 Perfect Stitch			
	Loose clinch.	Wrong thickness adjustment.	(1) Adjust thickness (paragraph 3-10.5). (2) Raise clinches (paragraph 3-10.5).
	Loose clinch.	Wrong thickness adjustment and clinches are set too high.	(1) Adjust thickness (paragraph 3-10.5). (2) Reset clinches (paragraph 3-10.5).
	Staple leg is spread.	Worn wire cutters.	Reverse or replace wire cutters (paragraph 3-10.1).
		Wire straighteners are not properly adjusted.	Reset wire straighteners.
		Worn bender bar.	Replace bender bar (paragraph 3-16.3).
	**Staple legs are contracted.**		Check wire cutters. Reverse or replace (paragraph 3-10.1).
		Wire straighteners are not properly adjusted.	Reset wire straighteners.
	Crown is buckled and tearing paper.	Wrong setting of thickness adjustment.	Reset thickness adjustment (paragraph 3-6).

3-10. MAINTENANCE PROCEDURES.

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

3-10.1 Replace Wire Cutters.

MOS: 83F, Photolithographer

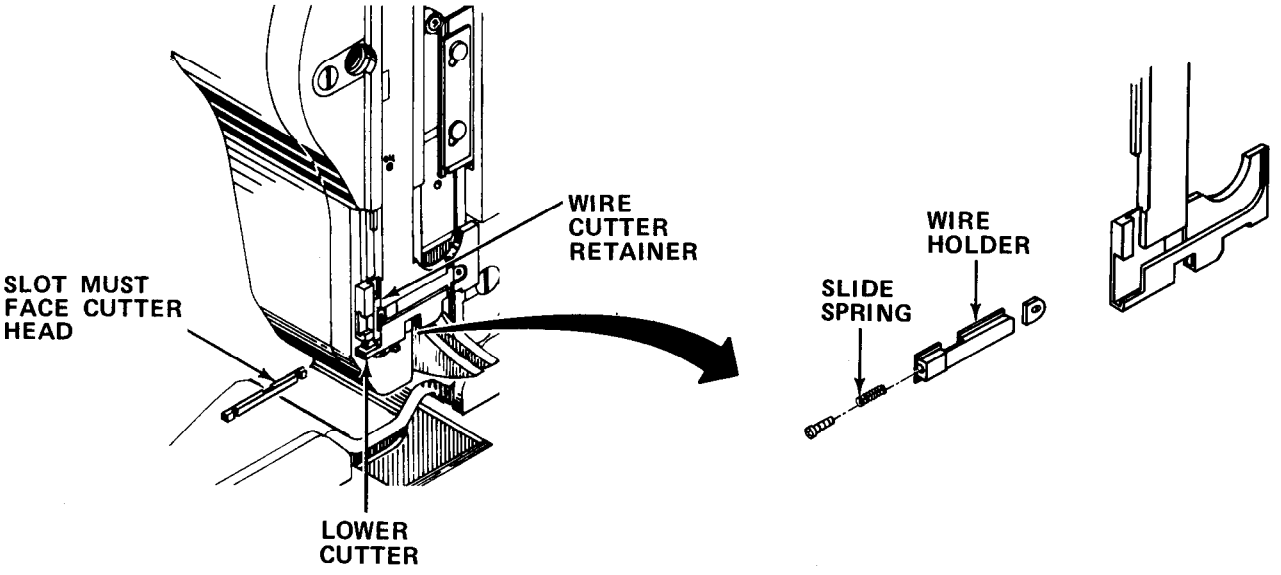
TOOLS : Flat Tip Screwdriver
Cross Tip Screwdirver

SUPPLIES: Wire Cutter

WARNING

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

a. Unplug power cord.



b. Loosen screw on rear belt guard and remove guard.

CAUTION

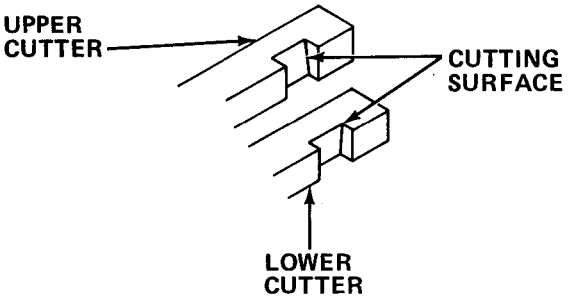
If force is used in closing stitcher head door, the stitcher will be damaged. If door binds, manually depress supporter until the swivel clears supporter and the door will close.

c. Push door latch to right and open stitcher head door.

d. Move wire holder slide spring and pin to the right and raise wire cutter retainer until upper cutter is free.

e. Slide upper cutter to left and remove from slot.

f. Raise lower cutter to position in which upper cutter had been. Slide to left and remove from slot.



g. Inspect cutters. Each cutter has four cutting surfaces. Rotating cutter or exchanging upper and lower cutters will bring new edge to bear against wire. When all four cutting surfaces are worn, new cutter must be used.

h. Replace lower cutter (center slot facing cutter head) by sliding into slot and pushing down.

i. Replace upper cutter (center slot facing cutter head) by sliding into slot.

j. Lower wire cutter retainer to lock cutters in position and thread wire.

CAUTION

If force is used in closing stitcher head door, the stitcher will be damaged. If door binds, manually depress supporter until the swivel clears supporter and the door will close.

k. Close stitcher head door.

l. Release pawl and rotate pulley manually to the right to check cutting action. Stitcher head must operate freely.

m. Replace rear belt guard and tighten screw.

n. Plug in power cord.

3-10.2 Replace Wire Grip.

MOS : 83F, Photolithographer

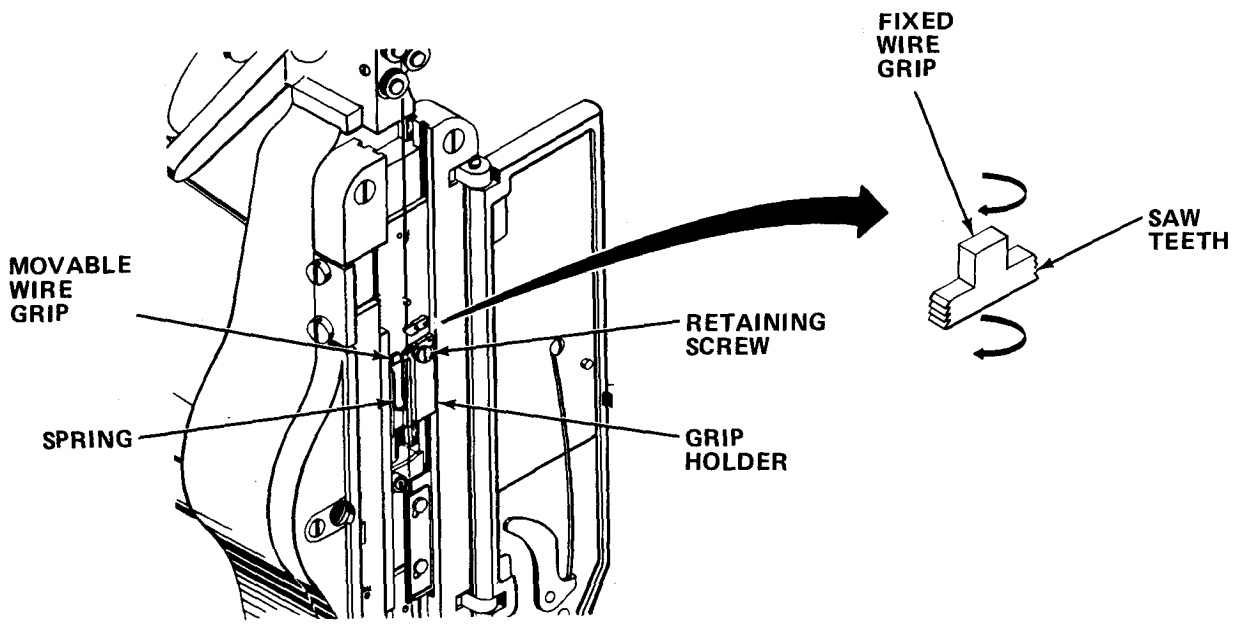
TOOLS: Flat Tip Screwdriver
Cross Tip Screwdriver
Needle Nose Pliers

SUPPLIES: Wire Grip

WARNING

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

a. Unplug power cord.



b. Loosen screw on rear belt guard and remove guard.

CAUTION

If force is used in closing stitcher head door, the stitcher will be damaged. If door binds, manually depress supporter until the swivel clears supporter and the door will close.

c. Move door latch to right and open stitcher head door.

d. Push wire grip spring to side and remove so that movable wire grip is free.

e. Remove retaining screw.

f. Remove fixed wire grip from grip holder.

g. Examine fixed wire grip saw teeth. If only one side is worn, turn fixed grip over so that fresh saw teeth face wire. If both sides are worn, replace with new grip.

h. Reinstall wire grip in grip holder.

i. Reinstall retaining screw and tighten screw.

j. Replace grip spring on movable wire grip.

CAUTION

If force is used in closing stitcher head door, the stitcher will be damaged. If door binds, manually depress supporter until the swivel clears supporter and the door will close.

k. Rethread wire if necessary. Release pawl and rotate pulley to the right. Check that head operates freely.

l. Replace rear belt guard and tighten screw.

CAUTION

Stitcher mechanism may be damaged if force is used to open or close stitcher head door.

m. Close stitcher head door.

n. Plug in power cord.

3-10.3 Replace Driver.

MOS: 83F, Photolithographer

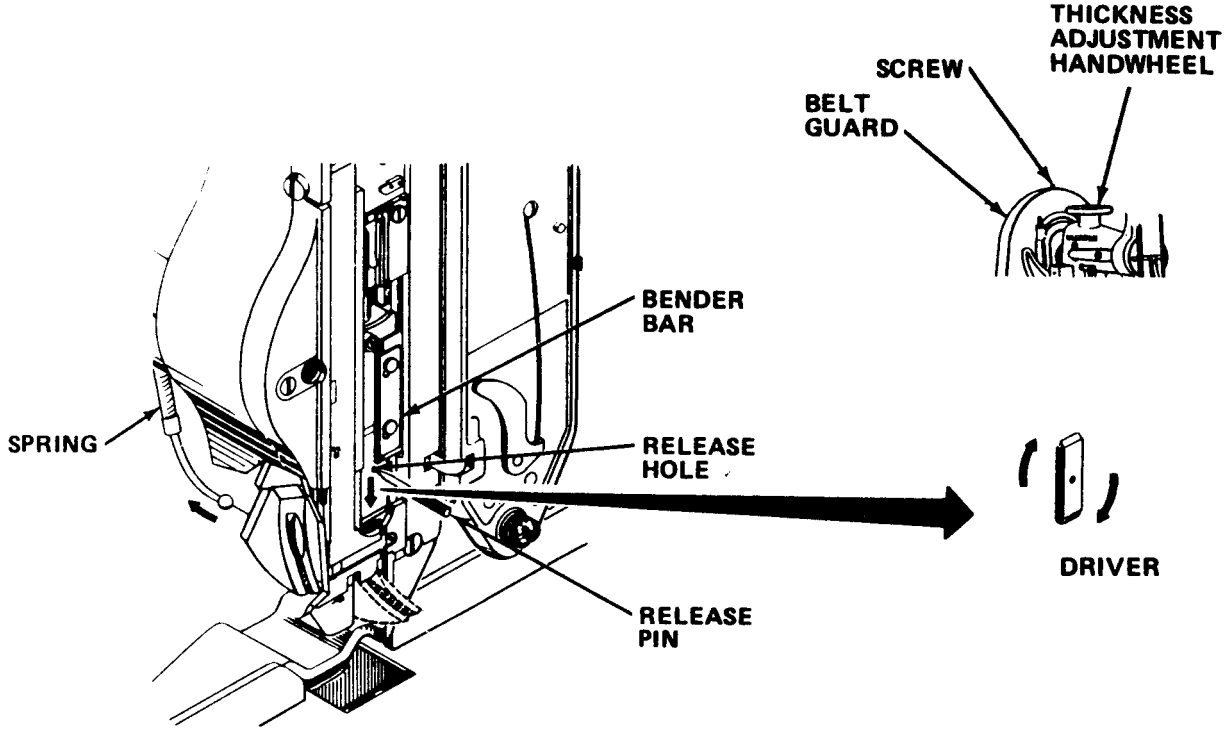
TOOLS: Flat Tip Screwdriver
Cross Tip Screwdriver
Deleted.

SUPPLIES: Round Wire Driver
Flat Wire Driver

WARNING

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

a. Unplug power cord.



b. Turn thickness adjustment handwheel to the left until handwheel tension is relieved.

CAUTION

If force is used in closing stitcher head door, the stitcher will be damaged. If door binds, manually depress supporter until the swivel clears supporter and the door will close.

c. Push door latch to right and open stitcher head door.

d. Loosen screw on rear belt guard and remove guard.

e. Lift panel to engage clutch and release brake.

f. Pull supporter spring rod free from supporter.

g. Rotate drive pulley to the right until release hole in driver is visible.

h. Insert driver release pin in release hole in driver.

i. Push driver release pin in and push driver from bottom of bender bar.

j. Examine driver. If one edge is worn, turn driver so other end faces downward. If both edges are worn, replace with new driver.

k. Insert driver in bottom of bender bar and slide upward until driver stops.

l. Depress tension spring with release pin and slide driver up until it clicks into place.

m. Reconnect supporter spring.

n. Rethread wire if necessary. Release pawl and rotate pulley to the right. Check that head operates freely.

o. Replace rear belt guard and tighten screw.

CAUTION

If force is used in closing stitcher head door, the stitcher will be damaged. If door binds, manually depress supporter until the swivel clears supporter and the door will close.

p. Close stitcher door.

q. Plug in power cord.

r. Adjust for stock thickness.

3-10.4 Replace Supporter Sping.

MOS : 83F, Photolithographer

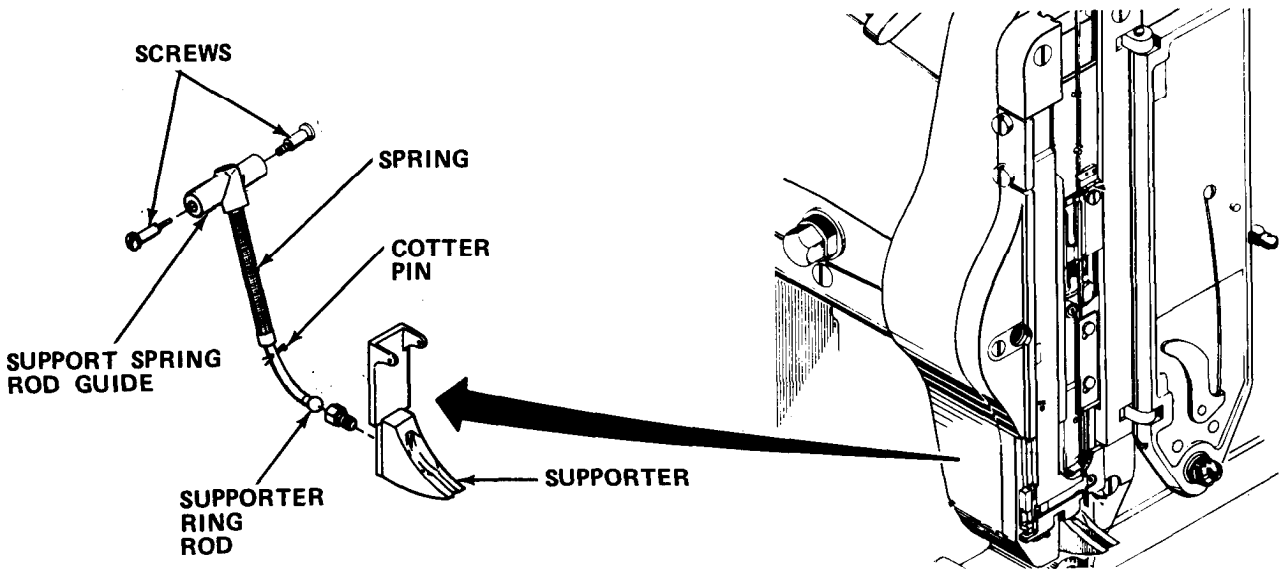
TOOLS: Round-Nose Pliers
Flat Tip Screwdriver

SUPPLIES: Supporter Spring

WARNING

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

a. Unplug power cord.



b. Pull supporter spring rod free from supporter.

c. Remove two screws to release supporter spring assembly.

d. Remove cotter pin from supporter spring rod and pull spring off rod.

e. Remove screws from supporter spring rod guide and pull spring off rod.

f. Install new spring on rod.

g. Reinstall supporter spring rod guide and secure with screws.

h. Hold spring and insert cotter pin.

i. Place supporter spring in position and replace two screws.

j. Position supporter spring rod on supporter.

k. Plug in power cord.

3-10.5 Adjust Clincher.

MOS: 83F, Photolithographer

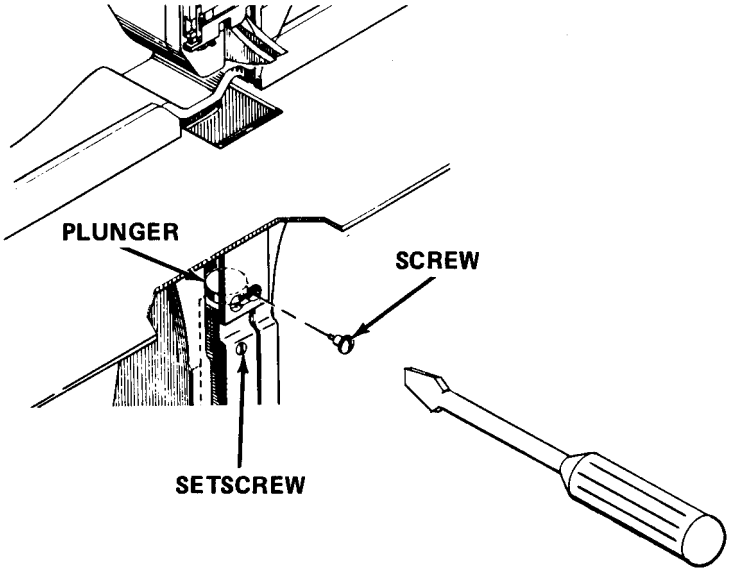
TOOLS: Flat Tip Screwdriver
3/4 in. Wrench

a. Adjust clincher.

WARNING

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

(1) Unplug power cord.



(2) Remove clincher slide retaining screw.

(3) Loosen plunger setscrew.

(4) Turn plunger to left or right, raising or lowering plunger.

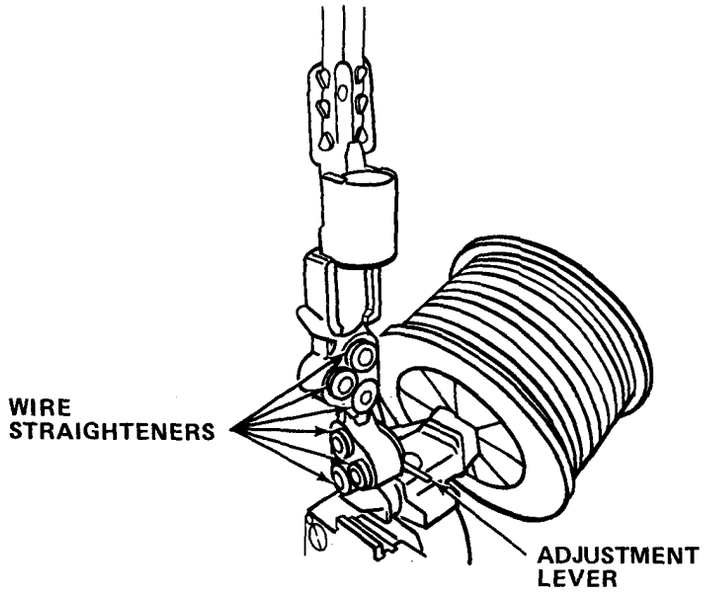
(5) Replace clincher slide retaining screw and tighten.

(6) Tighten plunger setscrew.

(7) Plug in power cord.

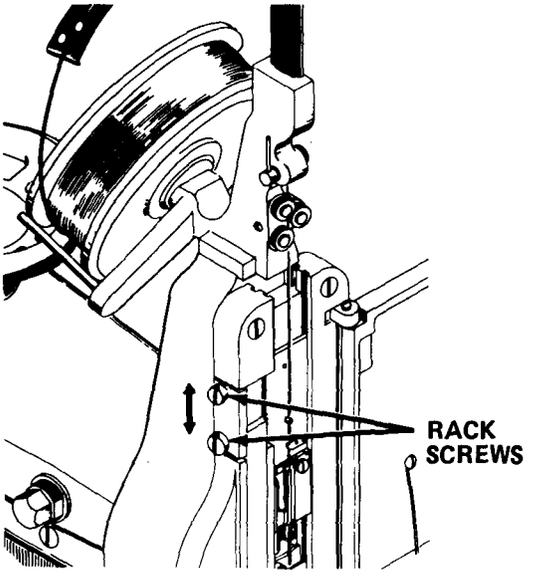
(8) Turn on power.

(9) Drive test staple. Readjust if required.



b. Adjust wire straighteners. Turn adjustment levers left or right until wire feeds vertically through wire straighteners without binding.

c. Adjust length of staple left leg.



NOTE

Do not loosen feed adjustment rack screws more than one complete turn to prevent rack from slipping.

(1) Loosen two wire feed adjustment rack screws.

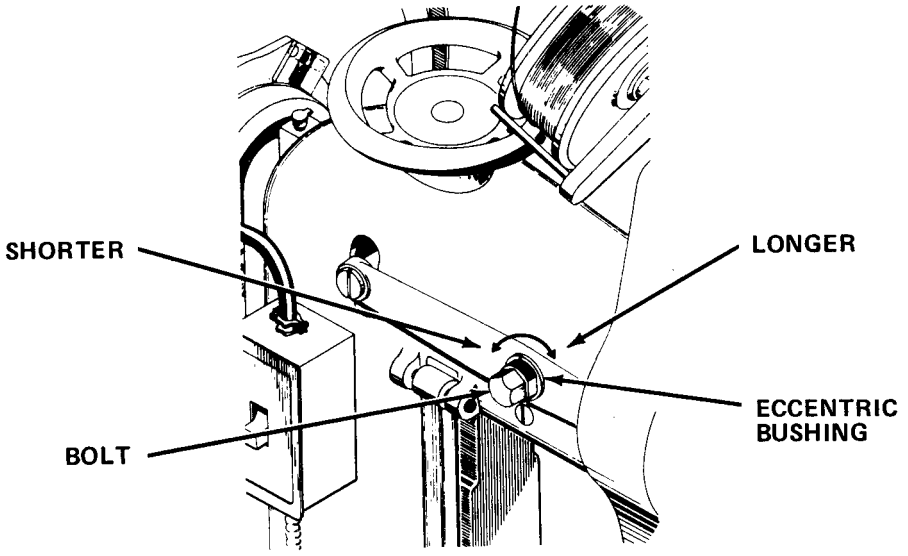
(2) Adjust adjustment rack.

(a) Left leg is too long; move up slightly.

(b) Left leg is too short; move down slightly.

(3) Tighten two wire feed adjustment rack screws. Drive test staple. Readjust if required.

d. Adjust length of both staple legs.



(1) Loosen adjustment lever eccentric bushing bolt until eccentric bushing is free to turn.

(2) If longer staple legs are required, turn eccentric bushing to right. If shorter staple legs are required, turn eccentric bushing to left.

(3) Tighten adjustment lever eccentric bushing bolt.

(4) Drive test staple. Readjust if required.

3-10.6 Adjust Supporter Spring.

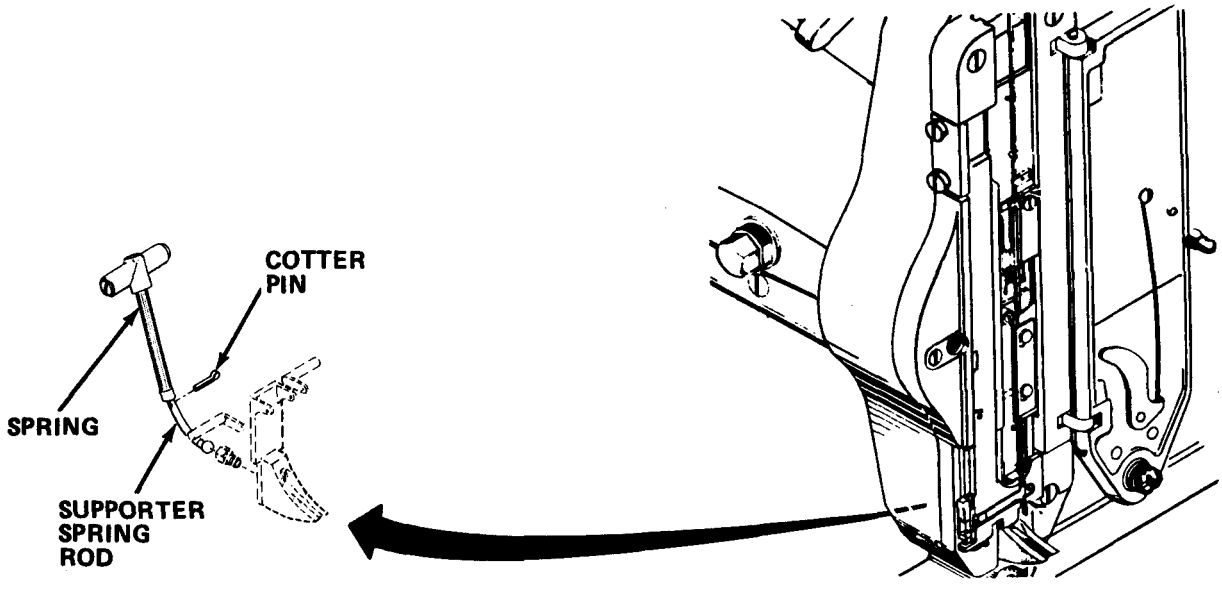
MOS: 83F, Photolithographer

TOOLS: Needle Nose Pliers

WARNING

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

a. Unplug power cord.



b. Pull supporter spring rod free from back of supporter.

c. Remove cotter pin from supporter spring rod.

d. Slide supporter spring up rod until next hole is visible and reinstall cotter pin.

NOTE

If cotter pin was removed from the uppermost of four holes in the rod, replace spring (paragraph 3-10.4).

e. Engage supporter spring rod on supporter.

f. Plug in power cord.

Section IV ORGANIZATIONAL MAINTENANCE

3-11. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication at this level of maintenance.

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 5-3610-253-24P covering organizational maintenance for this equipment.

3-13. SERVICE UPON RECEIPT.

3-13.1 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.

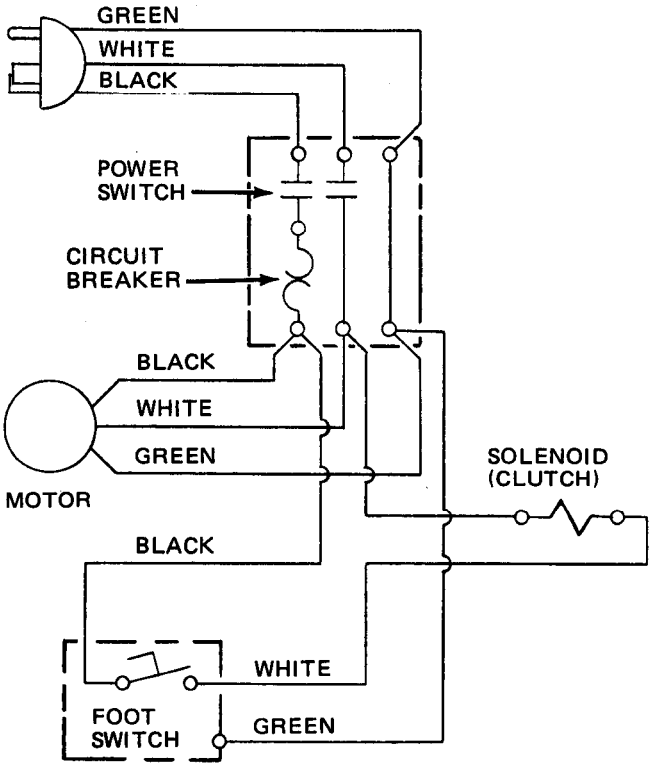
3-14. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES. There are no organizational PMCS procedures assigned for this equipment.

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 or foldout located at the end of this manual for further fault analysis.



d. If the paper stitcher 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 receptacles (Table 1-4).

Table 3-6. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. STITCHER DOES NOT OPERATE . MOTOR DOES NOT TURN.
Step 1. Check power switch for continuity.
(a) If continuity exists, proceed to step 2.
(b) If no continuity exists, replace power switch (paragraph 3-16.6).
Step 2. Check for power at motor.
(a) If no power at motor, replace wiring from switch to motor.
(b) If power exists at motor, replace motor (paragraph 3-16.5).
2. MOTOR TURNS. STITCHER DOES NOT OPERATE.
Step 1. Check for broken V-belt.
(a) If belt is good, proceed to step 2.
(b) If belt is broken, replace V-belt (paragraph 3-16.1)
Step 2. Check linkage for missing screws or bolts.
(a) If all hardware is intact, proceed to Step 3.
(b) Replace hardware as required.
Step 3. Check operation of footswitch.
(a) If setscrew in treadle is properly adjusted, proceed to Step 4.
(b) If setscrew in treadle does not activate switch, adjust setscrew.
Step 4. Check microswitch for continuity.
(a) If continuity exists, proceed to Step 5.
(b) If no continuity; replace microswitch (paragraph 3-16.10).

Table 3-6. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
2. MOTOR TURNS. STITCHER DOES NOT OPERATE - Cont
Step 5. Check solenoid for continuity.
(a) If continuity exists, proceed to Step 6.
(b) If no continuity, replace solenoid (paragraph 3-16.7).
Step 6. Check solenoid plunger for mechanical binding.
(a) If plunger binds, adjust control collar (paragraph 3-16.9).
(b) If plunger still binds, replace solenoid (paragraph 3-16.7).
3. CLUTCH BRAKE DOES NOT DRIVE BUT INPUT TURNS.
Step 1. Check for broken drive spring.
(a) If drive spring is not broken, proceed to step 2.
(b) If broken, replace defective drive spring (paragraph 3-16.2).
Step 2. Check control collar for jam.
(a) If not jammed, proceed to step 3.
(b) Clear jam.
Step 3. Check solenoid plunger for mechanical binding.
(a) If plunger binds, adjust control collar (paragraph 3-16.9).
(b) If plunger still binds, replace solenoid (paragraph 3-16.7).
4. CLUTCH BRAKE JAMS AND STALLS INPUT MOTOR.
Step 1. Check for spring tab broken off.
(a) If spring tab is not broken, proceed to step 2.
(b) If spring tab is broken, replace defective spring (paragraph 3-16.8).

Table 3-6. ORGANIZATIONAL TROUBLESHOOTING - **Cont**

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
4. CLUTCH BRAKE JAMS AND STALLS INPUT MOTOR - Cont
Step 2. Check clutch output for binding.
If output binds, adjust control collar (paragraph 3-16.9).
5. STITCHER HEAD STOPS IN DIFFERENT PLACES OR DOES NOT RETURN TO DESIRED POSITION.
Step 1. Check for spring tab broken off.
(a) If spring tab not broken, proceed to step 2.
(b) If broken, replace defective spring (paragraph 3-16.8).
Step 2. Check if lock screw on adjustable collar is loose.
If loose, adjust control collar and tighten lock screw (paragraph 3-16.9).

3-16. MAINTENANCE PROCEDURES.

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

3-16.1 Replace V-Belt.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 9/16 in. Combination Wrench
Flat Tip Screwdriver

SUPPLIES: V-Belt

WARNING

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

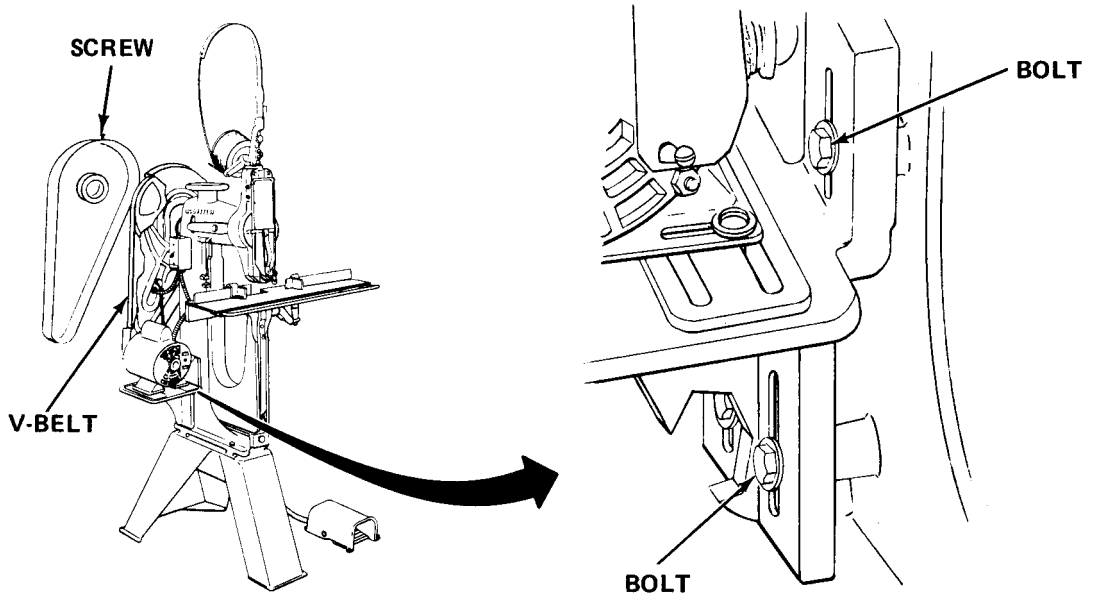
a. Unplug power cord.

b. Loosen screw on rear belt guard and remove guard.

c. Loosen motor bracket bolts.

d. Raise motor to ease tension on V-belt.

e. Remove defective V-belt.



f. Install new V-belt in pulley groove and motor pulley.

g. Push downward on motor to apply tension to V-belt.

NOTE

Approximately 1/4 in. (6.35 mm) deflection required in V-belt,

h. Tighten motor bracket bolts.

i. Replace rear belt guard and tighten screw.

j. Plug in power cord.

3-16.2 Replace Driver Bar Latch.

MOS: 83FJ6, Reproduction Equipment Repairer

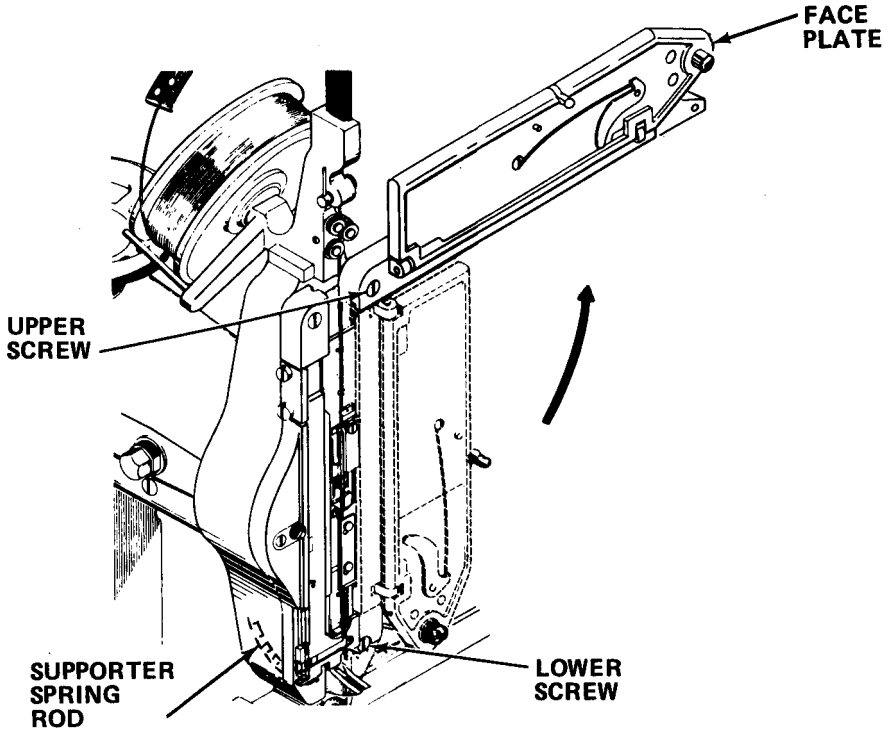
TOOLS: Flat Tip Screwdriver

SUPPLIES: Driver Bar Latch

WARNING

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

a. Unplug power cord.



b. Loosen screw on rear belt guard and remove guard.

c. Remove stitcher headguard.

d. Open stitcher head door.

e. Rotate thickness adjustment handwheel fully to right.

f. Unthread wire from stitcher head.

g. Release pawl and manually rotate pulley to the right until main shaft passes bottom of stroke and is one-fourth distance to top of next stroke.

h. Pull supporter spring rod from supporter.

i. Remove work guide from work table.

j. Move work table to saddle stitch position.

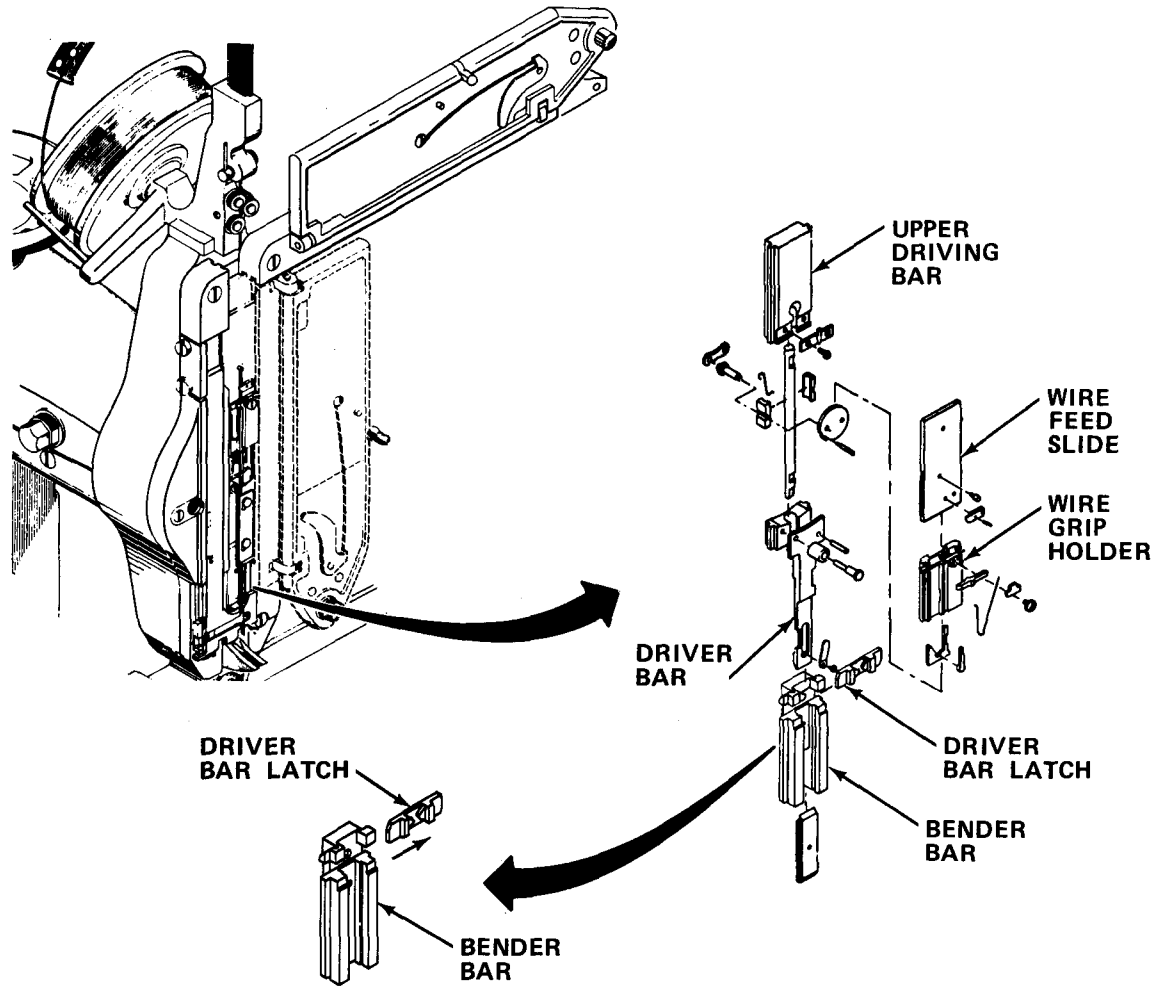
k. Remove headguard mounting pin from lower door hinge.

l. Remove lower screw from right faceplate and loosen upper screw.

NOTE

Hold wire feed slide in position.

m. Rotate right faceplate to horizontal position, and tighten upper screw to hold faceplate.



NOTE

The following assemblies are removed as a single unit. The upper driver bar must be disengaged from the main shaft connecting link and the supporter crank links must remain in their recessed position.

n. The wire feed slide, upper driving bar, wire grip holder, driver bar, and bender bar assemblies can now be removed from the left faceplate by pulling them away from the left faceplate, and sliding them upward.

o. Remove driver with release pin.

p. Remove driver bar latch from bender bar and replace with new latch.

q. Reinstall bender bar and new latch on the driver bar, then reinstall driver.

NOTE

The following assemblies are installed as a single unit. Be sure to engage the upper driving bar in the main shaft connecting link.

r. Reinstall wire feed slide, upper driving bar, wire grip holder, driver bar, and bender bar assemblies into left faceplate.

s. Loosen upper faceplate screw and rotate faceplate down to line up screw hole.

t. Reinstall lower faceplate screw, then tighten both the upper and lower faceplate screws.

u. Reinstall headguard mounting pin in lower door hinge.

v. Return work table to flat work position.

w. Reinstall work guide on work table.

x. Reinstall supporter spring rod in supporter.

y. Manually rotate pulley to the right until stitcher head returns to the top of its stroke.

z. Rethread wire in stitcher head.

aa. Turn thickness adjustment handwheel to desired stock thickness.

ab. Release pawl and manually rotate pulley to the right, observing stitcher head for freedom of movement.

ac. Close stitcher head door.

ad. Reinstall stitcher headguard.

ae. Reinstall rear belt guard.

af. Plug in power cord.

3-16.3 Replace Bender Bar

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Bender Bar

a. Unplug power cord.

b. Loosen screw on rear belt guard and remove guard.

c. Remove stitcher headguard.

d. Open stitcher head door.

e. Rotate thickness adjustment handwheel fully to right.

f. Unthread wire from stitcher head.

g. Release pawl and manually rotate pulley to the right until main shaft passes bottom of stroke and is one-fourth distance to top of next stroke.

h. Pull supporter spring rod from supporter.

i. Remove work guide from work table.

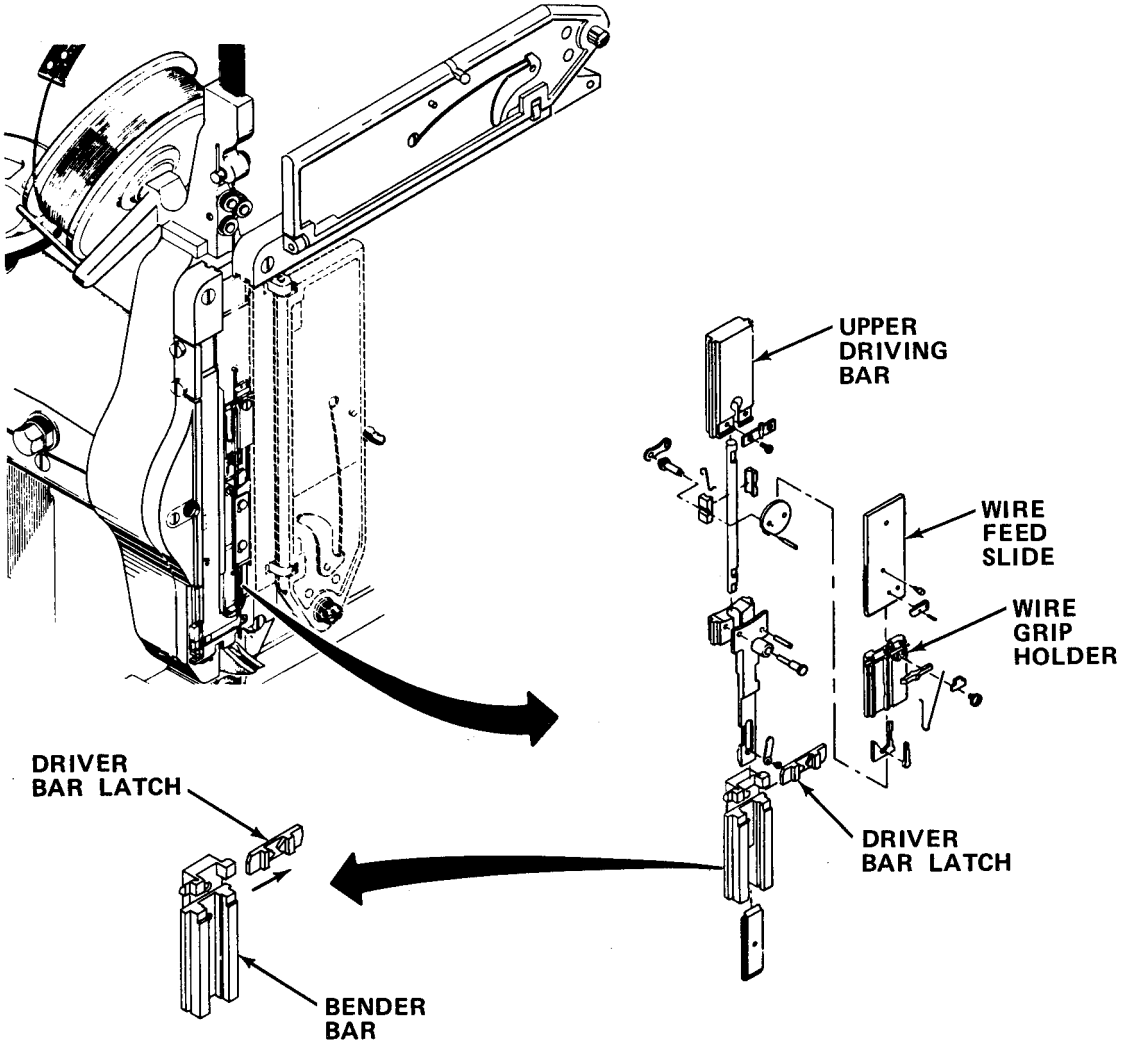
j. Move work table to saddle-stitch position.

k. Remove headguard mounting pins from lower door hinge.

l. Remove lower screw from right faceplate and loosen upper screw.

NOTE

Hold wire feed slide in position.



m. Rotate right faceplate to horizontal position and tighten upper screw to hold faceplate.

NOTE

The following assemblies will be removed as a single unit. The upper driver bar must be disengaged from the main shaft connecting link, and the supporter crank links must remain in their recessed position.

n. The wire feed slide, upper driving bar, wire grip holder, driver bar, and bender bar assemblies can now be removed from the left faceplate by pulling them away from the left faceplate and sliding them upward.

o. Remove driver with release pin.

p. Remove driver bar latch from bender bar and reinstall on new bender bar.

q. Reinstall new bender bar and latch on the driver bar and reinstall driver.

NOTE

The following assemblies are installed as a single unit. Be sure to engage the upper driving bar in the main shaft connecting link.

r. Reinstall wire feed slide, upper driving bar, wire grip holder, driver bar, and bender bar assemblies into left faceplate.

s. Loosen upper faceplate screw and rotate faceplate down to line up screw hole.

t. Reinstall lower faceplate screw and tighten both the upper and lower faceplate screws.

u. Reinstall headguard mounting pin in lower door hinge.

v. Return work table to flat work position.

w. Reinstall work guide on work table.

x. Reinstall supporter spring rod in supporter.

y. Manually rotate pulley to the right until stitcher head returns to the top of its stroke.

z. Rethread wire in stitcher head.

aa. Turn thickness adjustment handwheel to desired stock thickness.

ab. Release pawl and manually rotate pulley to the right, observing stitcher head for freedom of movement.

ac. Close stitcher head door.

ad. Reinstall stitcher headguard.

ae. Reinstall rear belt guard.

af. Plug in power cord.

3-16.4 Repair Swivel.

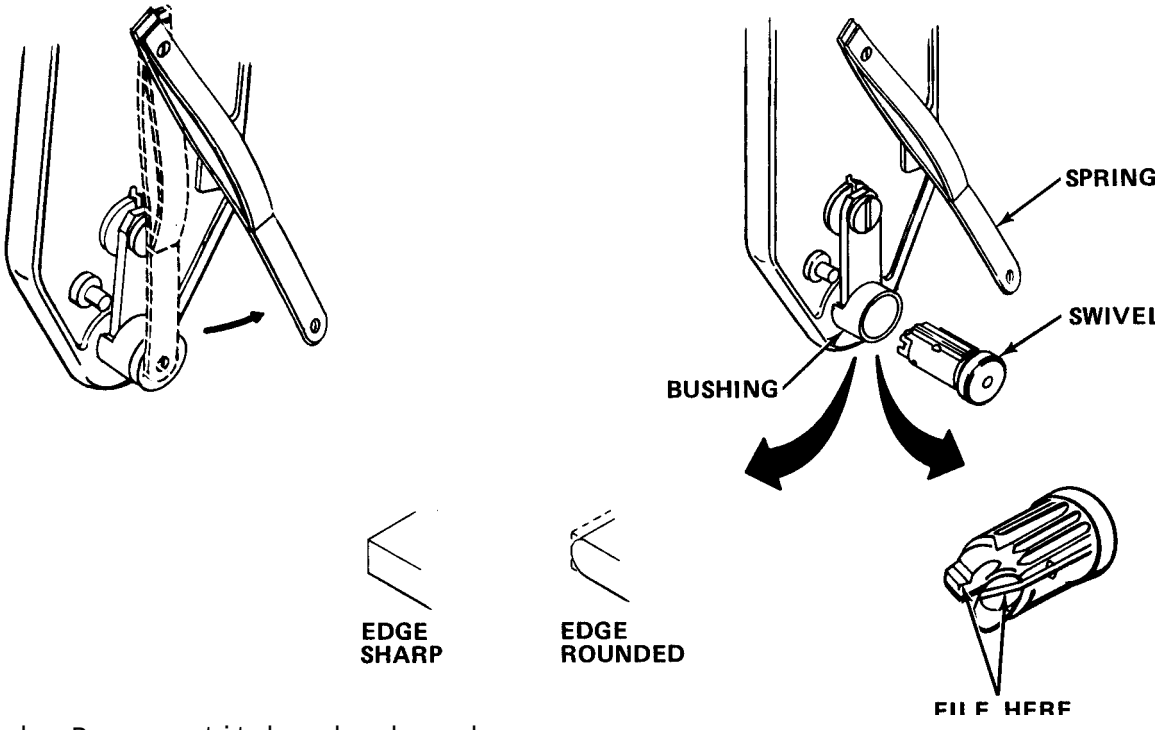
MOS : 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
Hand File

WARNING

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

a. Unplug power cord.



b. Remove stitcher headguard.

c. Lift swivel spring and rotate to side to clear swivel.

d. Pull swivel from swivel bushing.

e. File sharp edges to remove sharp edges or burrs.

NOTE

Do not file excessively. Only remove sharp edge to form rounded surfaces where wire is contacted.

f. Install swivel in bushing.

g. Place swivel spring to hold swivel.

h. Reinstall stitcher headguard.

i. Plug in power cord.

3-16.5 Replace Motor.

MOS: 83FJ6, Reproduction Equipment Repairer

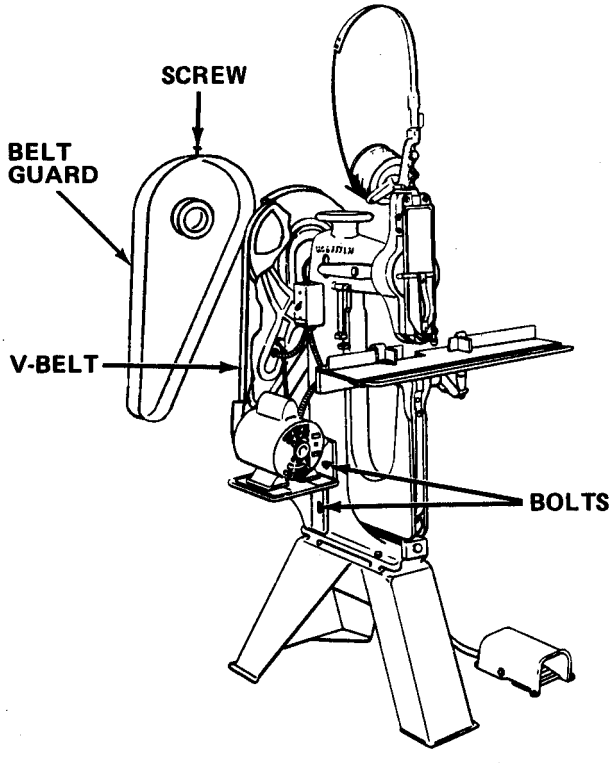
TOOLS: 9/16 in. Combination Wrench
Flat Tip Screwdriver
Hex Head Key Wrench

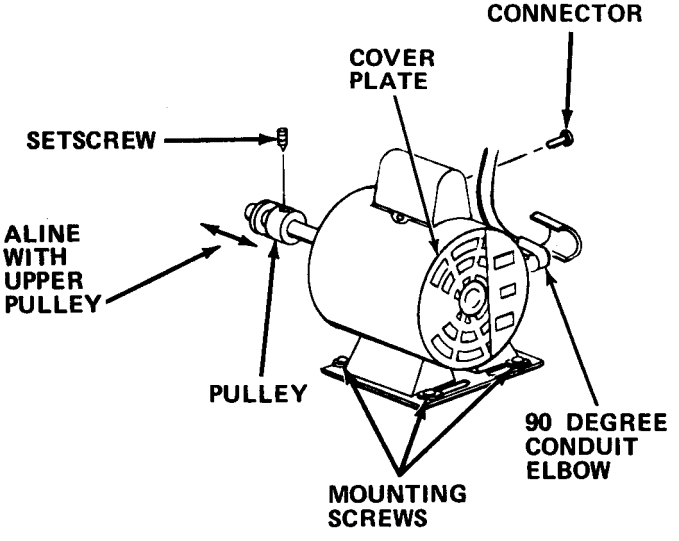
SUPPLIES: Motor (1/3 HP)

WARNING

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

a. Unplug power cord.





b. Loosen rear belt guard screw and remove guard.

c. Loosen motor bracket bolts.

d. Raise motor bracket until V-belt can be removed.

e. Remove V-belt.

f. Remove motor mounting screws.

g. Move motor slightly to gain access to conduit.

h. Remove cover plate and 90 degree conduit elbow. Retain elbow.

i. Tag and remove terminal connectors and wires.

j. Remove defective motor.

k. Remove pulley from defective motor and install on new motor.

l. Connect terminal connectors to new motor and install 90 degree conduit elbow and cover plate.

NOTE

Pulley must line up with upper pulley. Adjustment of motor mounting screws may be required to line up pulleys.

m. Line up motor and secure with mounting screws.

n. Lift motor bracket.

o. Reinstall V-belt.

p. Press downward on motor bracket to obtain correct tension on V-belt.

NOTE

Approximately 1/4 in. (6.35 mm) deflection required in V-belt.

q. Tighten bolts to hold bracket.

r. Replace rear belt guard and tighten screw.

s. Plug in power cord.

3-16.6 Replace Power Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

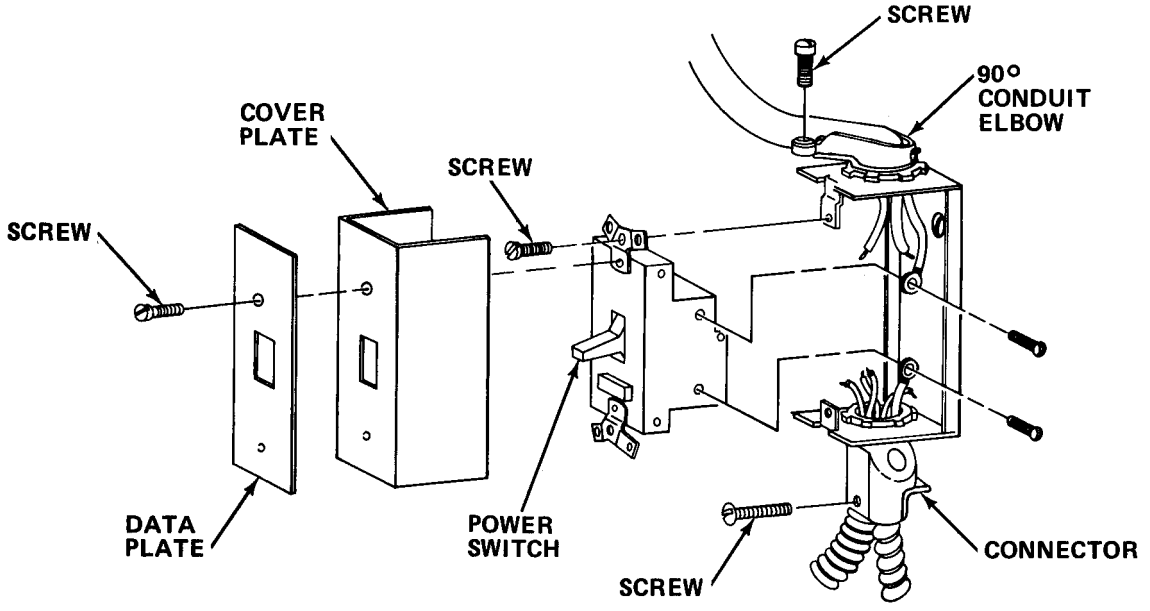
TOOLS: Flat Tip Screwdriver
Crimping/Stripping Tool

SUPPLIES: Power Switch

WARNING

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

a. Unplug power cord.



b. Remove retaining screws from cover plate on power switch and remove data plate and cover plate.

c. Remove 90 degree conduit elbow from top of switch box.

d. Remove screw from cable set on bottom of switch box.

e. Remove screws and pull power switch away from box on stitcher until slots beside wire connectors are accessible.

f. Tag and disconnect wires from defective switch.

g. Reconnect wire to new switch.

h. Install new switch in switch box.

i. Reconnect cable connector.

j. Reinstall 90 degree conduit elbow.

k. Reinstall cover plate and data plate.

l. Plug in power cord.

3-16.7 Replace Solenoid.

MOS: 83FJ6, Reproduction Equipment Repairer

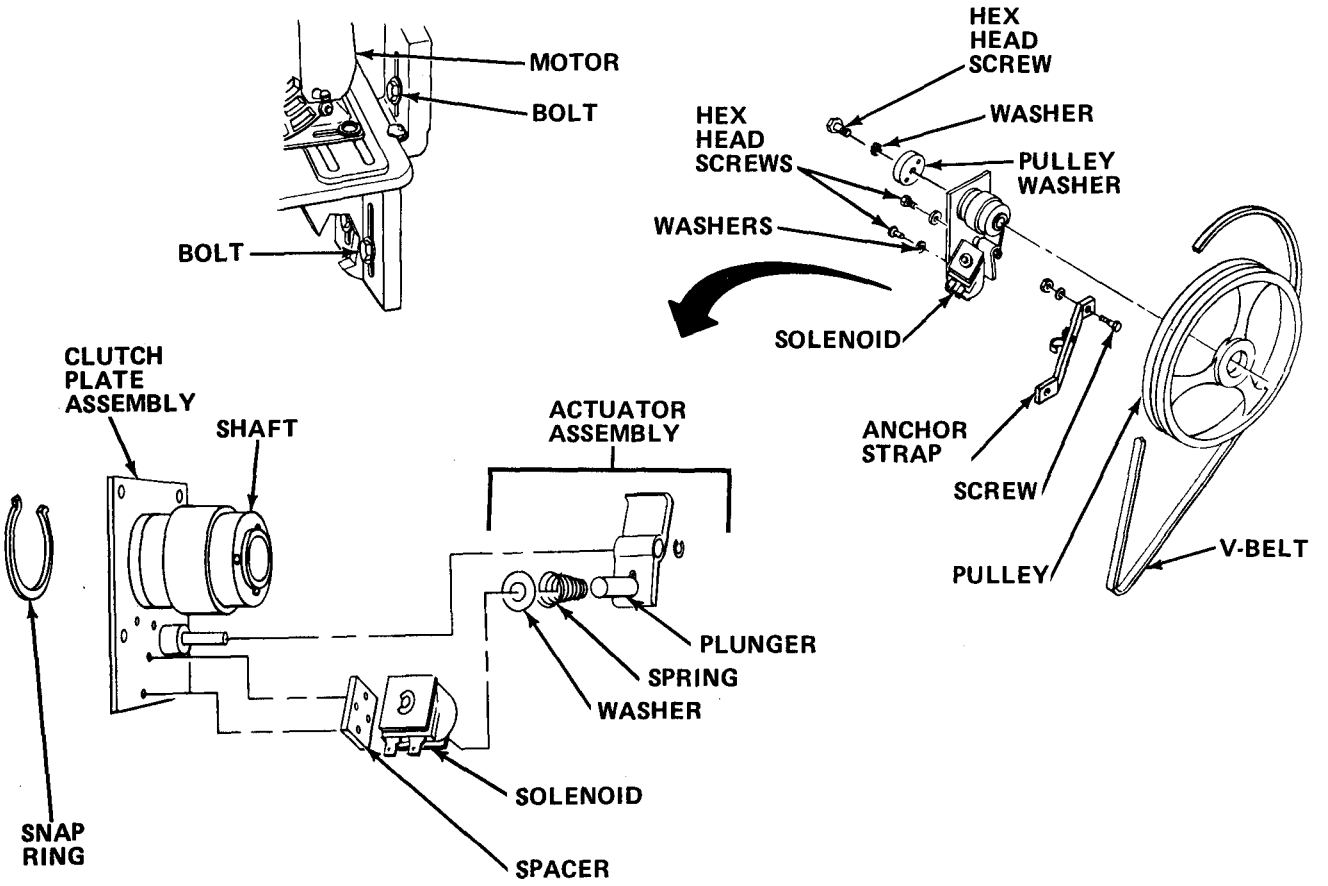
TOOLS: 7/16 in. Combination Wrench (2)
9/16 in. Combination Wrench
Hex Head Key Wrench

SUPPLIES: Solenoid

WARNING

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

a. Unplug power cord.



b. Loosen screw on rear belt guard and remove belt guard.

c. Loosen motor bracket bolts to slacken V-belt.

d. Raise motor bracket. Remove V-belt.

e. Remove hex head screw, washer, and pulley washer.

f. Remove hex nut, lockwasher, and anchor strap screw to disconnect anchor strap from clutch plate.

g. Tag and remove female wire connectors from tabs on solenoid.

h. Note position of clutch. Swing anchor bracket clear to slide pulley and clutch off shaft as unit.

i. Remove socket head screws and washers to release solenoid. Note position of actuator assembly and remove defective solenoid.

j. Install new solenoid.

k. Slide pulley and clutch on shaft in original position.

l. Reconnect anchor strap with strap screw, lockwasher, and hex nut.

m. Push female wire connectors on solenoid tabs.

n. Reinstall washer, pulley washer, and hex head screw on pulley.

o. Reinstall V-belt.

p. Press down on motor mount to obtain correct tension on V-belt.

NOTE

Approximately 1/4 in. (6.35 mm) deflection is required in V-belt.

q. Tighten motor bracket bolts.

r. Reinstall rear belt guard and tighten screw.

s. Plug in power cord.

3-16.8 Replace Clutch, Brake, or Anti-Backup Spring.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Cross Tip Screwdriver
Snap Ring Pliers
9/16 in. Combination Wrench
Needle Nose Pliers

SUPPLIES: Spring

WARNING

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

NOTE

Before beginning the following procedure, it is critical that you mark the position of the upper drive bar on the head frame. The stitcher head must-be at the top of-its stroke.

a. Unplug power cord.

b. Loosen screw on rear belt guard and remove belt guard.

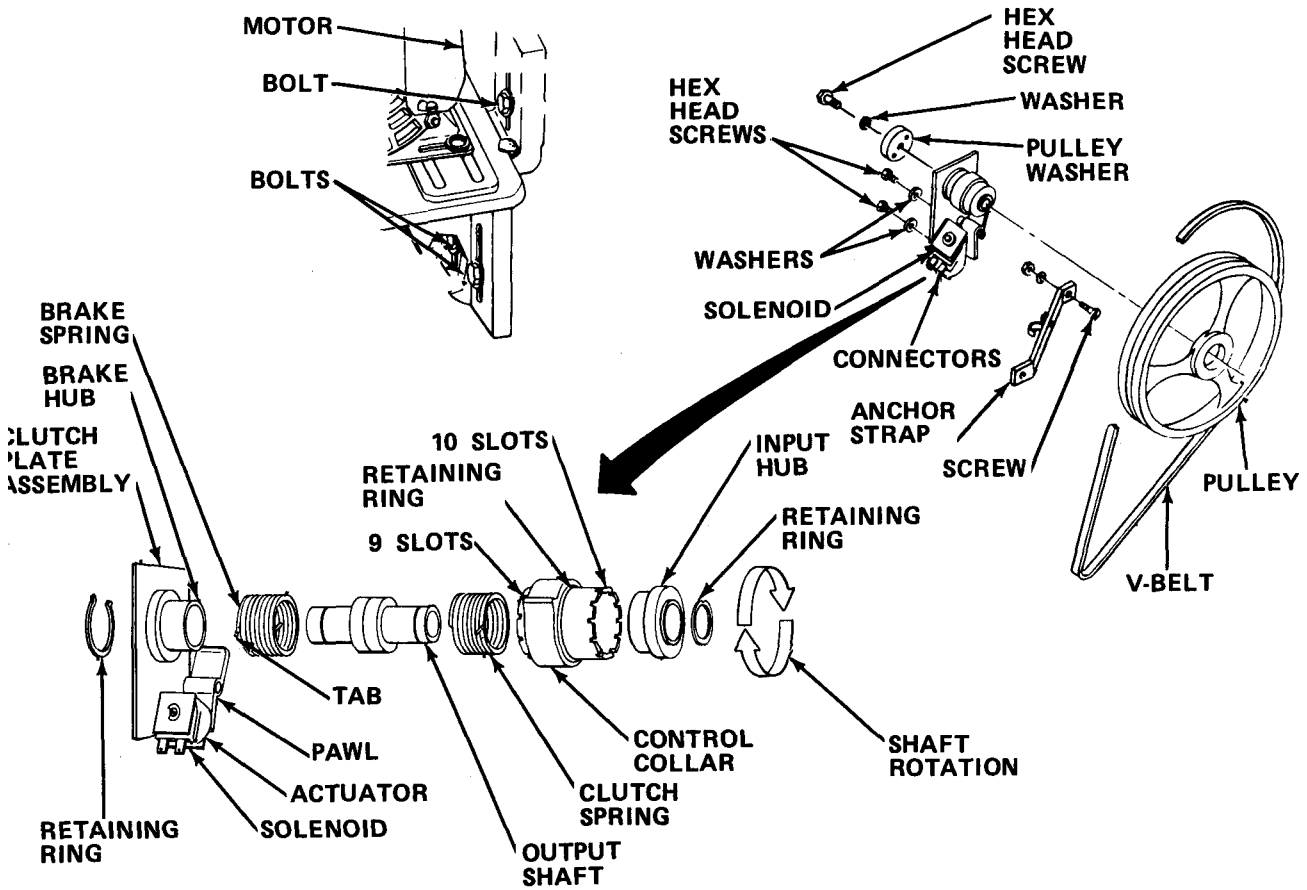
c. Loosen motor bracket bolts to slacken V-belt.

d. Raise motor bracket. Remove V-belt.

e. Remove hex head screw, washer, and pulley washer.

f. Remove hex nut, lockwasher, and anchor strap screw to disconnect anchor strap from mounting plate.

g. Tag and remove female wire connectors from tabs on solenoid.



h. Note position of clutch; then swing anchor bracket clear to slide pulley and clutch off shaft as unit.

i. Remove capscrews and washers on pulley and remove pulley.

NOTE

When disassembling clutch/brake unit, always mark the spring tab location with reference to which slot they go in if-the same springs are to be used in reassembly.

j. Release actuator lever to engage clutch and release brake.

k. Remove retaining ring from input hub end.

l. Remove input hub by rotating to right.

m. Remove retaining ring from mounting plate end.

NOTE

In the following step do not disassemble brake hub from mounting plate.

n. Remove output shaft springs and control collar assembly by rotating output shaft to right.

NOTE

If the anti-backup spring is to be replaced, perform the following steps:

o. Replace broken or defective anti-backup spring; then proceed to step t.

p. Remove control collar from output shaft and spring assembly by pulling collar toward brake spring end.

q. Examine springs. Replacement spring may be used for either clutch or brake spring.

r. Replace defective or broken spring.

NOTE

Both springs must seat firmly on shaft and be placed evenly on shaft.

s. Slide control collar over output shaft and spring assembly from the brake spring end. It will be necessary to extend brake spring with needle nose pliers.

NOTE

If original brake spring is to be reinstalled, place tab in original slot.

t. Position tab on brake spring into any of nine slots in control collar assembly.

u. Assemble output shaft, springs, and control collar assembly to the mounting plate assembly by rotating output shaft in drive direction.

NOTE

Smooth surface of ring faces brake hub.

v. Reinstall retaining ring on output shaft at mounting plate end.

w. Rotate output shaft in drive direction until full brake action occurs.

NOTE

Clutch spring tab must not engage collar slot at this time.

x. Rotate input hub in opposite direction from drive direction and slide hub on input shaft.

y. Select collar slot for clutch spring tab that will permit collar to rotate 3/8 in. to 1/2 in. (10 mm to 13 mm). Selection is made by testing slots . If control collar does not have sufficient travel, move collar toward input hub and rotate collar until brake spring tab alines with new slot. Repeat steps until 3/8 in. to 1/2 in. (10 mm to 13 mm) rotation is obtained.

NOTE

Smooth surface of ring faces shaft.

z. Replace retaining ring on output shaft.

aa. Replace drive pulley and secure with capscrews.

ab. Slide pulley and clutch on shaft in original position.

ac. Connect anchor strap with strap screw, lockwasher, and hex nut.

ad. Push female wire connectors on solenoid tabs.

ae. Reinstall pulley washer, washer, and hex head screw on driving pulley.

af. Reinstall V-belt.

ag. Press down on motor mount to tension belt.

NOTE

Approximately 1/4 in. (6.35 mm) deflection is required in V-belt.

ah. Tighten motor bracket bolts.

NOTE

It may be necessary to adjust control collar at this point.

ai. Replace rear belt guard and tighten screw.

aj. Plug in power cord.

3-16.9 Adjust Control Collar.

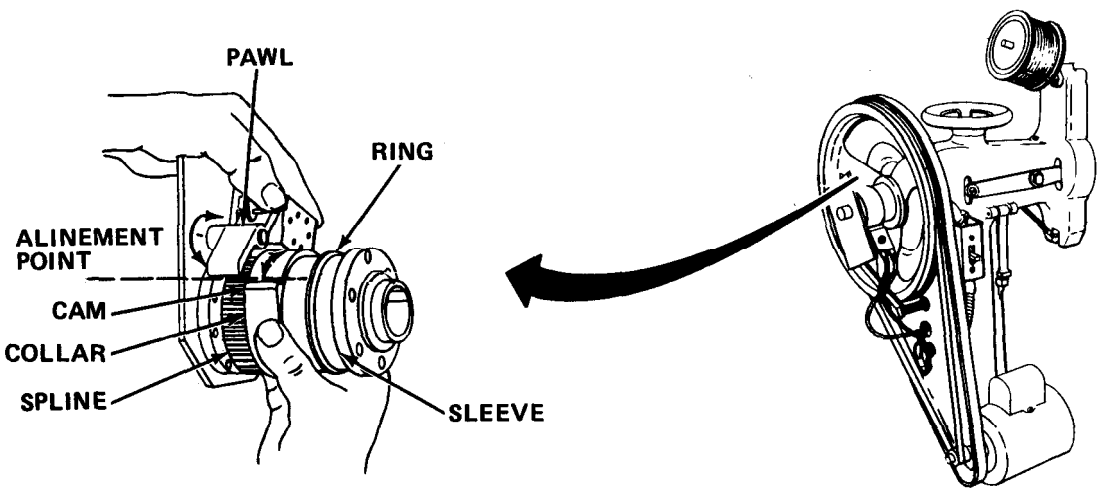
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver

WARNING

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

a. Unplug power cord.



b. Loosen screw on rear belt guard and remove guard.

c. Release pawl and rotate stitcher pulley until stitcher head is at stopping position.

d. Work retaining ring out of groove and slide toward pulley.

e. Slide control collar off splines until it rotates freely.

f. Manually rotate head to full upward stroke. Holding pawl away from splines, rotate control collar to position where pawl will engage cam (alinement point).

g. Push control collar onto splines and release pawl.

h. Slide retaining ring back into groove.

i. Reinstall rear belt guard and tighten screw.

j. Plug in power cord.

3-16.10 Replace Microswitch.

MOS: 83FJ6, Reproduction Equipment Repairer

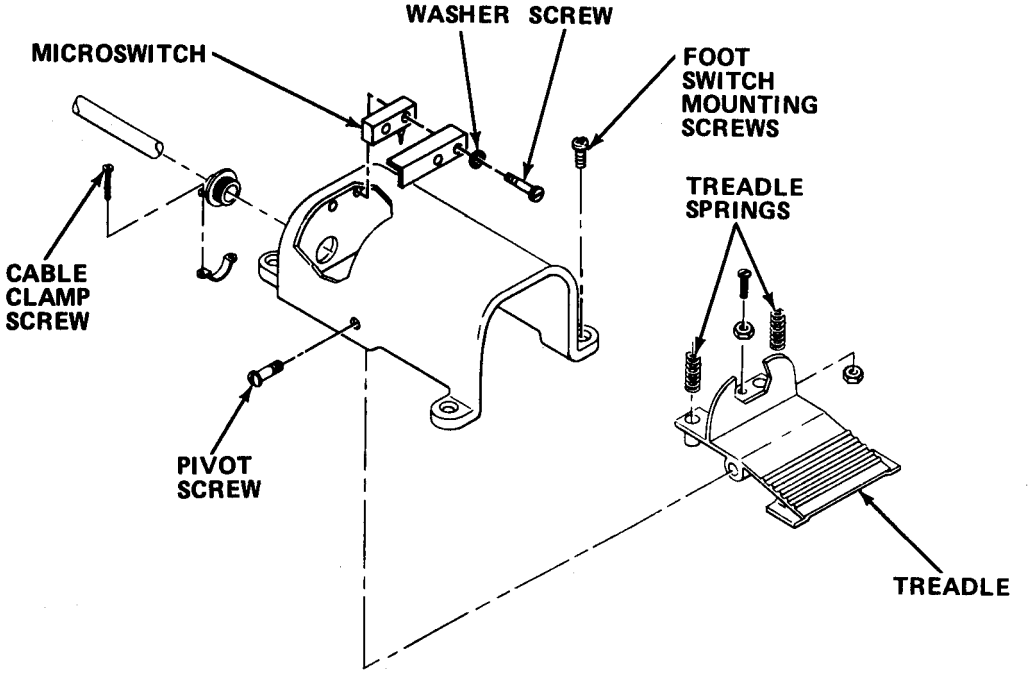
TOOLS: Flat Tip Screwdriver
Cross Tip Screwdriver

SUPPLIES: Microswitch

WARNING

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

a. Unplug power cord.



b. Remove foot switch mounting screws.

c. Remove pivot screws to release treadle.

d. Loosen screws on cable clamp.

e. Remove screws and washers holding microswitch.

f. Pull microswitch until terminals are accessible.

g. Tag and remove wires from defective microswitch.

h. Connect wires to new microswitch.

i. Install new microswitch and secure with washers and screws.

j. Tighten cable clamp.

NOTE

Be sure that treadle spri ngs are seated properly.

k. Replace treadle and secure with pi vot screws.

l. Reinstall mounting screws.

m. Plug in power cord.

3-16.11 Remove/Install Paper Stitcher.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS: Socket Set, 1/2 in. Drive

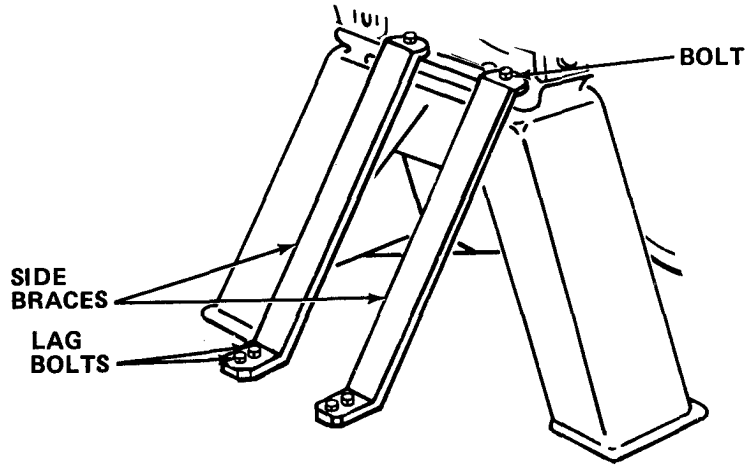
SUPPLIES: Paper Stitcher

WARNING

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

a. Unplug power cord.

b. Remove bulk wire reel.



c. Remove lag bolts holding treadle guard to floor.

d. Remove lag bolts holding side braces to floor.

e. Remove bolts holding paper stitcher to side braces.

f. Remove lag bolts and washers holding paper stitcher to floor.

WARNING

Serious injury to personnel or damage to equipment may occur unless two or more personnel are used to remove and replace paper stitcher because of weight and balance.

g. Remove paper stitcher.

h. Replace paper stitcher by bolting side braces to stitcher.

i. Aline side braces over holes in floor and secure with lag bolts.

j. Install bolts holding paper stitcher to side braces.

k. Install washers and lag bolts holding paper stitcher to floor.

l. Secure treadle guard to floor using lag bolts.

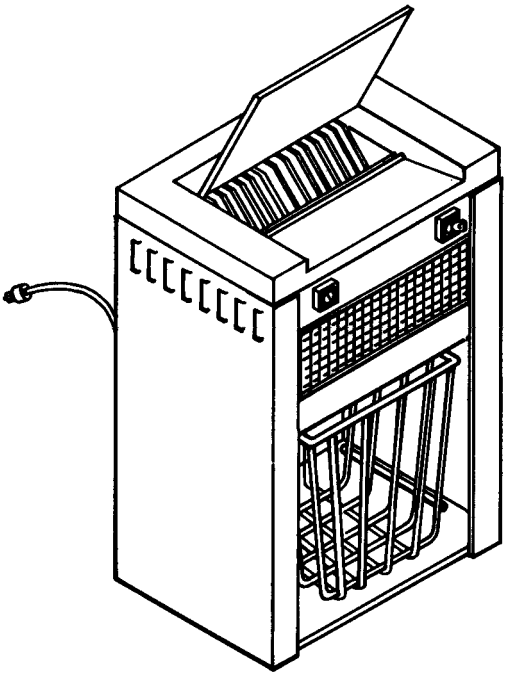
m. Replace bulk wire reel.

n. 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

PAPER SHREDDER

Section I INTRODUCTION

4-1. GENERAL INFORMATION.

4-1.1 Scope.

a. Model number and equipment name. Model 48 Paper Shredder.

b. Purpose of equipment. To transform paper, photographs, or transparencies into small, unreadable shreds.

4-2. EQUIPMENT DESCRIPTION.

4-2.1 Equipment Characteristics, Capabilities, and Features.

a. Safety designed to provide classified shredding.

b. Will destroy light metal and staples without damage to machine.

c. Will shred up to 10 sheets of bond paper or equivalent thickness of photographs or transparencies.

d. Air-cooled cutting blades.

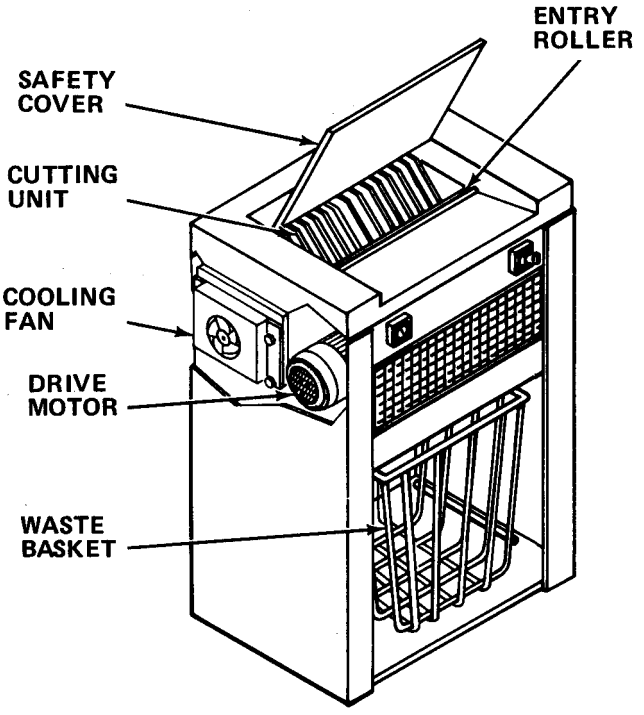
e. Overfeed protection shuts down drive motor if unit is overfed.

f. Wastebasket overfill switch shuts down unit when wastebasket is filled to capacity.

g. Power reverse switch cleans blades and ejects jammed material by reversing blade rotation.

h. Key-controlled on/off switch protects against unauthorized use.

4-2.2 Location and Description of Major Components.



SAFETY COVER. Clear plastic cover shields cutting unit from access. Safety switch shuts cutting unit down if cover is opened. Paper is fed between edge of safety cover and paper entry roller.

ENTRY ROLLER. Roller under edge of safety cover guides paper into cutting unit.

DRIVE MOTOR. Provides power to cutting unit and cooling fan.

COOLING FAN. Axial air pump that provides cooling air jets directed at cutting blades.

CUTTING UNIT. Contains cutting blades. The actual shredding operation is accomplished here.

WASTEBASKET. Wire frame basket collects and stores shredded material.

4-2.3 Equipment Data.

Manufacturer	Cummins-Allison Corp.
Series	Model 48
Dimensions	
Height	37 1/2 in. (94.3 cm)
Width	23 1/2 in. (59.7 cm)
Depth	23 5/8 in. (60.0 cm)
Feed Capacity	12 7/8 in. width (32.7 cm) 10 sheets thickness
Motor Hp	2 hp
Power Requirements	220 V, 60 Hz, three-phase, 7 amps

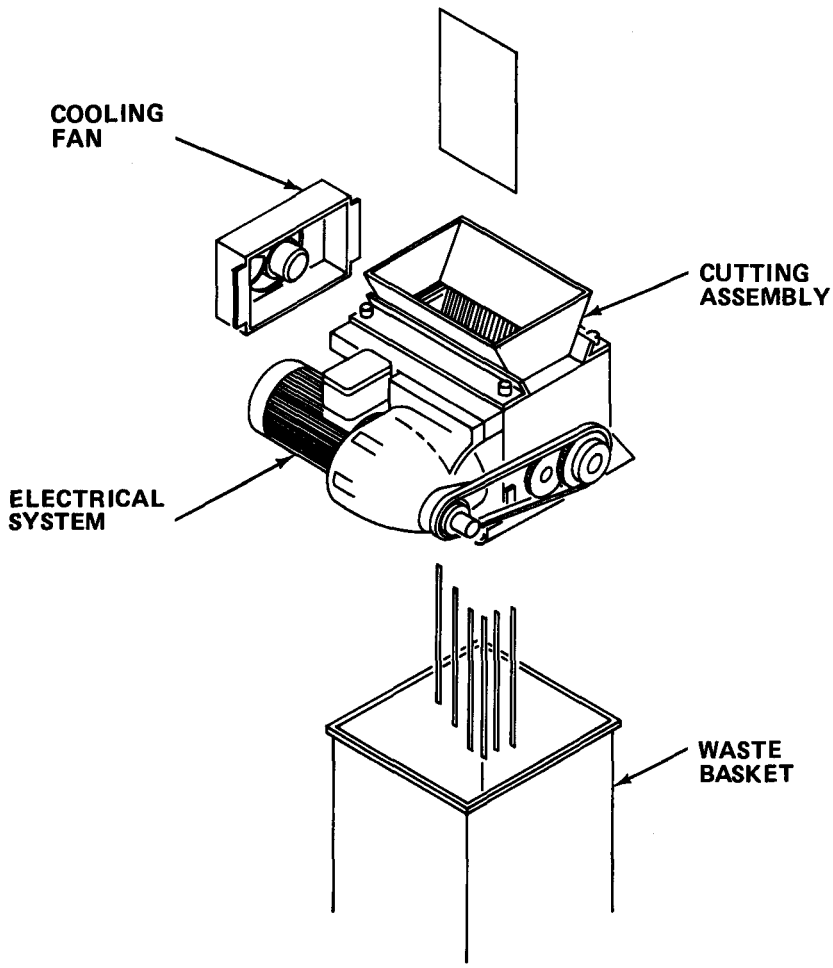
4-3. TECHNICAL PRINCIPLES OF OPERATION. The function of the paper shredder is to reduce paper sheets, photographs, and transparencies into small, unreadable shreds. The shredder consists of:

Cutting Blade Assembly

Cooling Fan

Wastebasket

Electrical System



4-3.1 Cutting Blade Assembly. Performs the actual shredding operation. It is composed of:

a. Cutting blades. Serrated, spiral-groove blades approximately 0.029 in. (0.74 mm) thick. They will destroy light metal and staples with no damage to the blades.

b. Cutting blade spacers. Separate the cutting blades and rotate with the blades.

c. Cutting blade separators. Provide the shearing surface for the cutting operation. They are fixed and do not rotate.

d. Drive motor. Provides geared-down, high-torque, rotary power for the cutting blades.

e. Drive chain. Is a high-strength roller design riding on sprockets, and transmits power from the drive motor to the cutting blades.

4-3.2 Cooling Fan. Provides cooling air for the cutting blades. It consists of:

a. Blower. A motor-driven, axially designed fan mounted to the side of cutter housing.

b. Air tubes. Directs cooling air from blower onto cutting blades by a series of drilled holes in sides of tubes.

4-3.3 Wastebasket. This is a wire frame basket positioned under cutter. A polyethylene bag is placed in wastebasket to allow ease of removal and disposal. The waste level is monitored by a metal flap which opens a microswitch when bag is full. The microswitch shuts down the machine.

4-5.4 Electrical System. Provides power and control to paper shredder. It consists of:

a. Drive motor. Controlled by a relay. It drives cooling fan and cutting blades. If there is an overload in cutting unit, the relay will sense it and shut off motor. This allows time for cutting unit to be cleared. The relay also detects if safety cover is open or wastebasket is full.

b. Key switch. Prevents unauthorized operation of paper shredder.

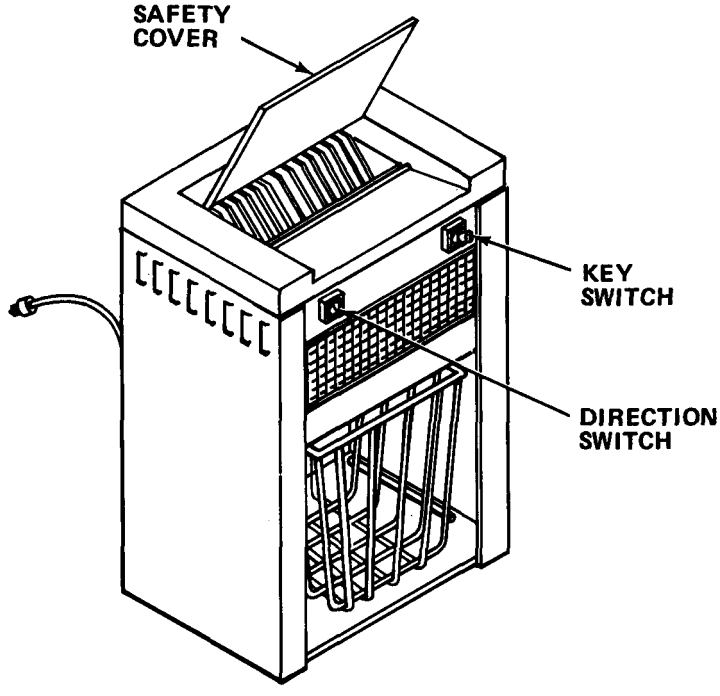
c. Direction switch. Controls shredder operation. In forward position, the cutter blades rotate inward (looking from top) to shred paper. In reverse position, the cutter blades rotate outward (looking from top) to clean blades or clear them if jammed.

d. Safety cover switch. Prevents shredder from operating if plastic safety cover is not-closed.

e. Wastebasket overfill switch. Shuts shredder down if wastebasket overfill flap detects a full wastebasket. The shredder will reactivate when wastebasket is emptied.

Section II OPERATING INSTRUCTIONS

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



Control or Indicator	Function
Key Switch	Prevents unauthorized use of paper shredder by disconnecting power supply when key is removed. (O: OFF, 1: ON)
Safety Cover	Prevents blade rotation when open.
Direction Switch	1 (forward): Blades rotate inward to shred materials. 0 (off): Blades do not rotate. R (reverse): Blades rotate outward and eject material.

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

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

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

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

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

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

Item	Quantity
Brush	1 ea
Vacuum Cleaner	1 ea

Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE

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

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

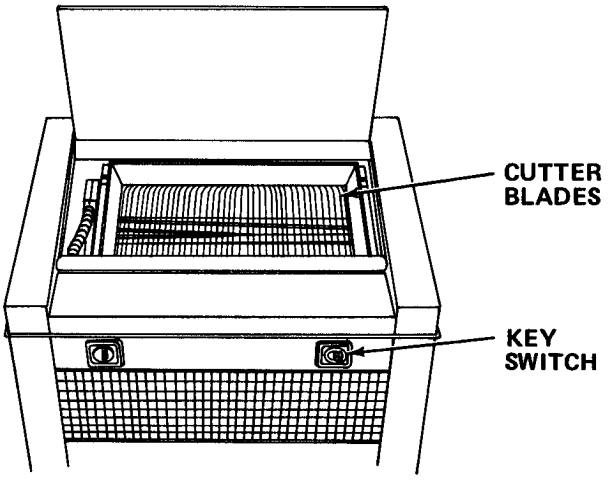
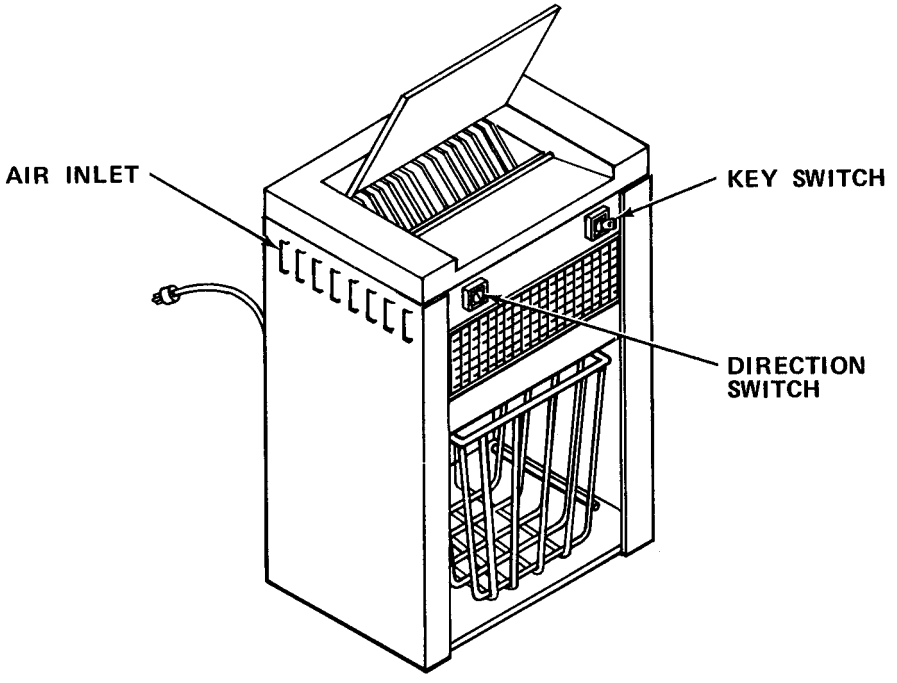
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER SHREDDER	
1	W	Inspect Shredder.	
		1. Plug in power cord.	
			
		2. Inspect cutter blades for damage or excessive wear, and clean with brush and vacuum if necessary.	
		3. Turn key switch to 1.	

Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER SHREDDER - Cont	
1	W	Inspect Shredder - Cont	

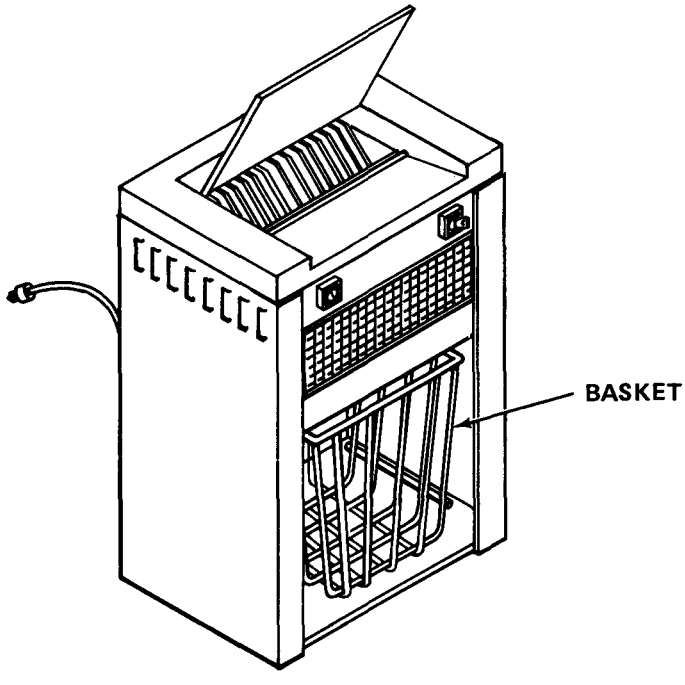


4. Turn direction switch to “1” (forward) position.
5. Inspect blower for operation by checking for presence of airflow into cabinet air inlet.
6. Turn direction switch to “0”.
7. Turn key switch to “0”.

Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER SHREDDER - Cont	
2	B	Inspect Wastebasket.	

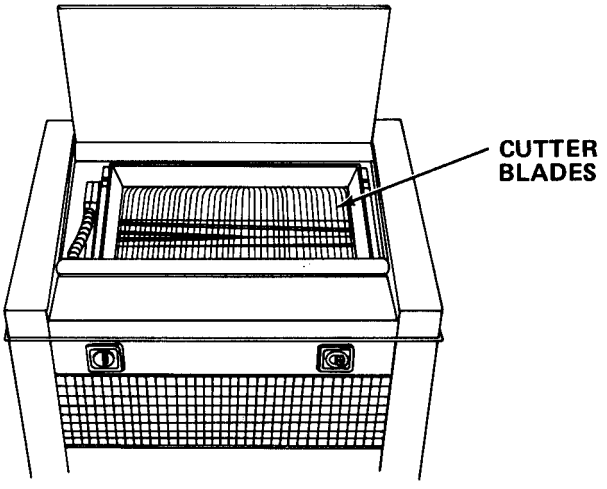


Check contents of wastebasket and empty if necessary.

Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

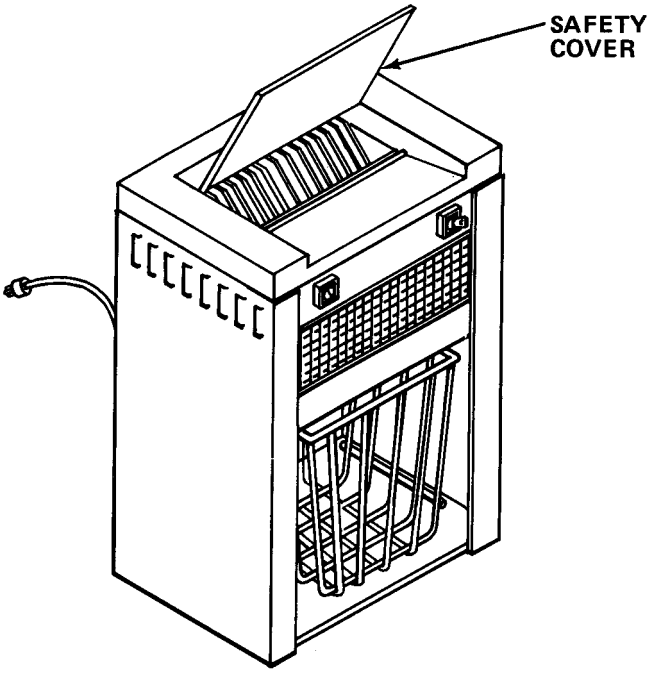
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER SHREDDER - Cont	
3	D	**Service Blades.**	



1. Turn key switch to “1”.
2. Close safety cover.
3. Turn direction switch in reverse position for one minute, to clean cutter blades.
4. Turn direction to “1” (forward) position.
5. Turn key switch to “0” (off).

Table 4-1. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER SHREDDER - Cont	
4	B	Inspect Safety Cover Switch.	
		1. Turn key switch to “1” (on) position.	
		2. Turn direction switch to “1” (forward) position.	
			
		3. Check safety cover switch operation by opening safety cover while shredder is in operation. Shredder should stop.	Shredder does not stop .
		4. Turn direction and key switches to “0” position.	

4-6. OPERATION UNDER USUAL CONDITIONS

4-6.1 Operating Procedures.

a. Starting unit.

(1) Insert key into key switch. Turn key to right, to "1" position. Turn direction switch to "l" (forward).

NOTE

Maximum of 10 sheets may be fed at one time. Books, etc. greater than 15 sheets must be taken apart.

(2) Feed material to be shredded into the paper shredder by sliding it over paper entry and under protective plastic cover. Material falls into feed hopper and is shredded by cutting unit.

b. Shutting unit down. Turn direction switch to "0" position. Turn key switch to "0" position.

c. Clearing jammed paper. In the event of overfeeding, the shredder blades will stop if you immediately turn the direction switch to the "R" position. The paper will be ejected into the feed hopper. It can then be divided into smaller units and refed after direction switch is set back to "l" position. However, if the motor does stop, you must wait approximately 1 minute before setting the direction switch to "R" position and ejecting the paper.

4-6.2 Operating Instructions on Decals and Instruction Plates.

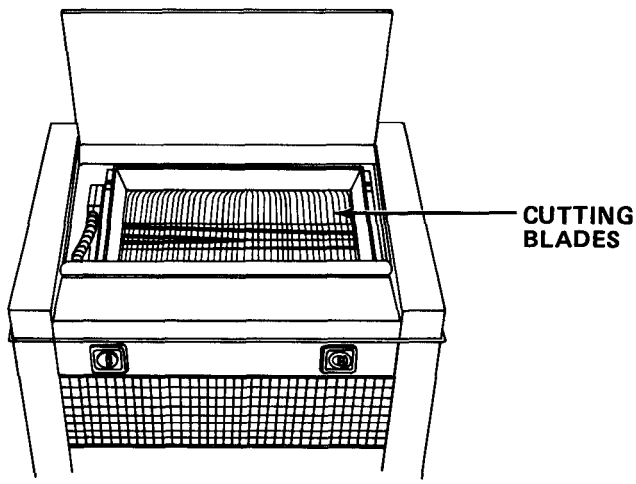
4-7. **OPERATION UNDER UNUSUAL** CONDITIONS. This equipment is designed for operation only in a controlled environment.

Section III OPERATOR MAINTENANCE

4-8. LUBRICATION INSTRUCTIONS.

NOTE

These lubrication instructions are mandatory.



Squirt general purpose oil (Item 16, Appendix E) directly across feed opening onto cutting blades after every hour of operation and after use.

4-9. TROUBLESHOOTING PROCEDURES

a. The table lists the common malfunctions which you may find during operation or maintenance of the paper shredder, '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 4-2. TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
CUTTING BLADES DO NOT ROTATE.
Step 1. Check position of safety cover.
(a) If cover is closed, proceed to step 2.
(b) Close safety cover.
Step 2. Check position of direction switch.
(a) If switch is properly positioned, proceed to step 3.
(b) Turn direction switch to position “1” or position “R”.
Step 3. Check position of key switch.
(a) If switch is in position “1”, proceed to step 4.
(b) Turn key switch to position “1”.
Step 4. Check to see if power cord is plugged in.
(a) If power cord is plugged in, proceed to step 5.
(b) Plug in power cord.
Step 5. Check for full wastebasket.
Empty wastebasket.

4-10. MAINTENANCE PROCEDURES. There are no operator maintenance procedures assigned for this equipment.

Section IV ORGANIZATIONAL MAINTENANCE

4-11. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication at this level of maintenance.

4-12. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT. These items are not required at this level of maintenance.

4-13. SERVICE UPON RECEIPT.

4-13.1 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.

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. There are no organizational maintenance procedures assigned for this equipment.

4-17. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE

4-18. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT.

4-18.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

4-18.2 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.

4-18.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-3610-253-24P covering direct/general support maintenance for this equipment.

4-19. 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.

Table 4-3. DIRECT/GENERAL SUPPORT TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. CUTTING BLADES DO NOT ROTATE.
Step 1. Check safety cover switch with multimeter.
(a) If continuity exists, proceed to step 2.
(b) If continuity does not exist, replace safety cover switch (paragraph 4-20.3).
Step 2. Check key switch.
(a) If key switch operates properly, proceed to step 3.
(b) Replace key switch (paragraph 4-20.1).

Table 4-3. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
1. CUTTING BLADES DO NOT ROTATE - Cent	
Step 3. Check drive chain for proper engagement with sprockets.	(a) If drive chain engages properly, proceed to step 4. (b) Replace drive chain (paragraph 4-20.7).
Step 4. Check drive motor for rotation.	(a) If drive motor rotates correctly, proceed to step 5. (b) Replace drive motor (paragraph 4-20.6).
Step 5. Check cutting head for damage.	Replace damaged cutting head (paragraph 4-20.8).
2. COOLING FAN DOES NOT OPERATE.	
Check cooling fan for operation.	Replace cooling fan (paragraph 4-20.9).
3. WASTEBASKET OVERFILLS AND JAMS CUTTING BLADES.	
Check wastebasket overfill switch for shutdown of paper shredder when activated.	Replace wastebasket overfill switch (paragraph 4-20.5).

4-20. MAINTENANCE PROCEDURES.

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

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

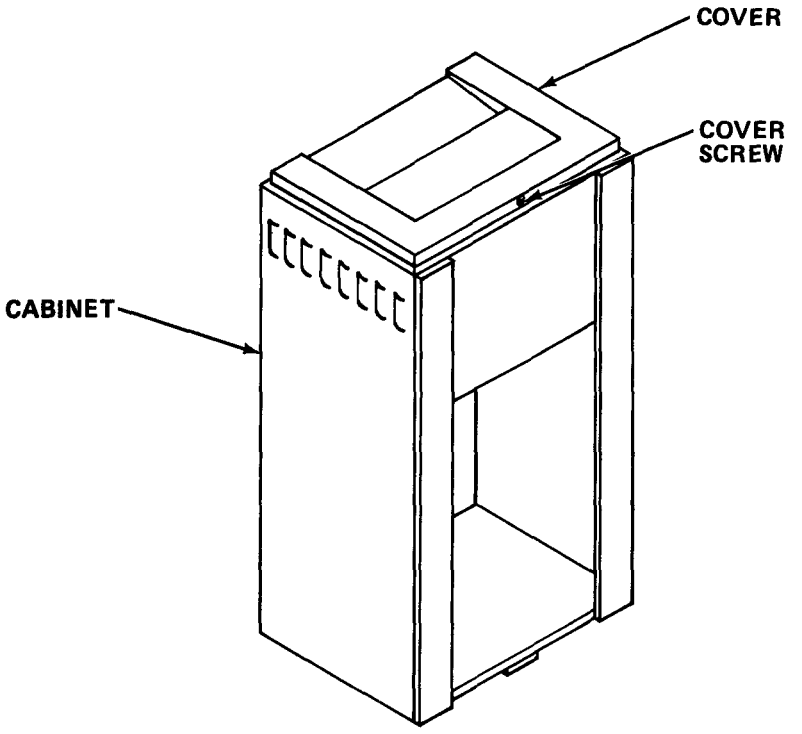
INDEX

4-20.1 Replace Key Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Offset Flat Tip Screwdriver

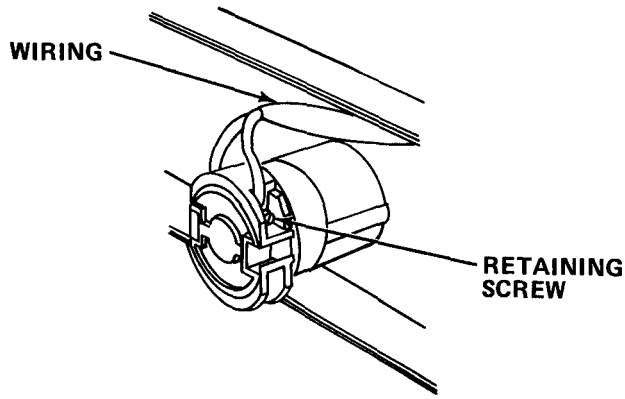
SUPPLIES: Key Switch



WARNING

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

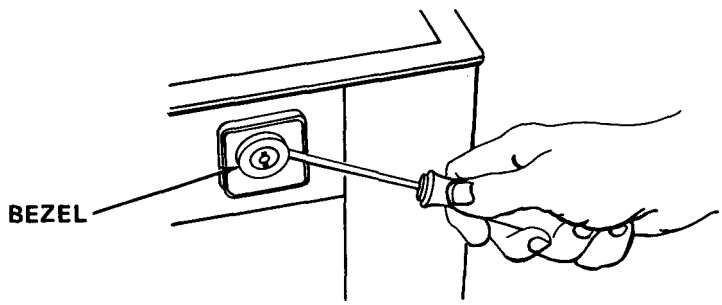
a. Remove top cabinet cover retaining screw. Lift top cabinet cover off cabinet.



NOTE

Tag wiring before removal to be sure of proper reconnection.

b. Tag and remove wiring from key switch.



c. Pry off bezel with screwdriver.

d. Remove retaining screws and brace from key switch. Remove key switch.

e. Replace key switch and retain with screws.

f. Reinstall bezel.

g. Reconnect wiring.

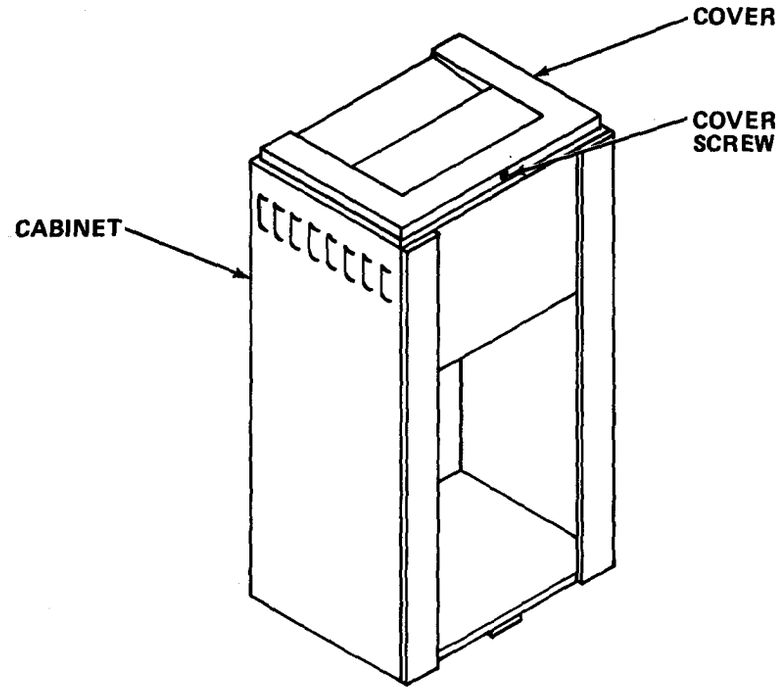
h. Reinstall top cabinet cover and retaining screw.

4-20.2 Replace Direction Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Direction Switch



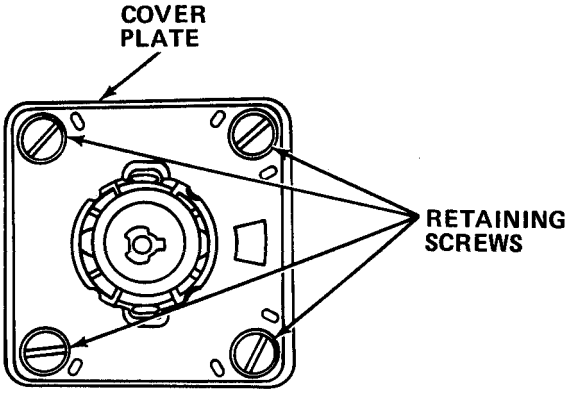
WARNING

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

a. Unplug power cord.

b. Remove retaining screw and top cabinet cover.

c. Remove direction switch knob.

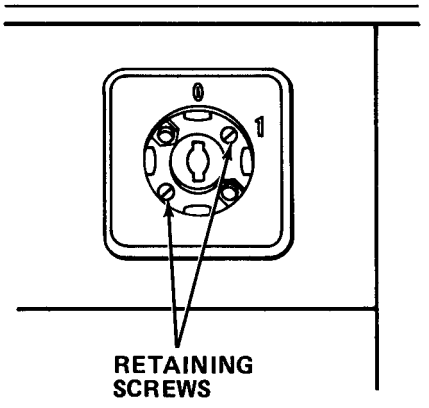


NOTE

Tag wiring before removal to be sure of proper reconnection.

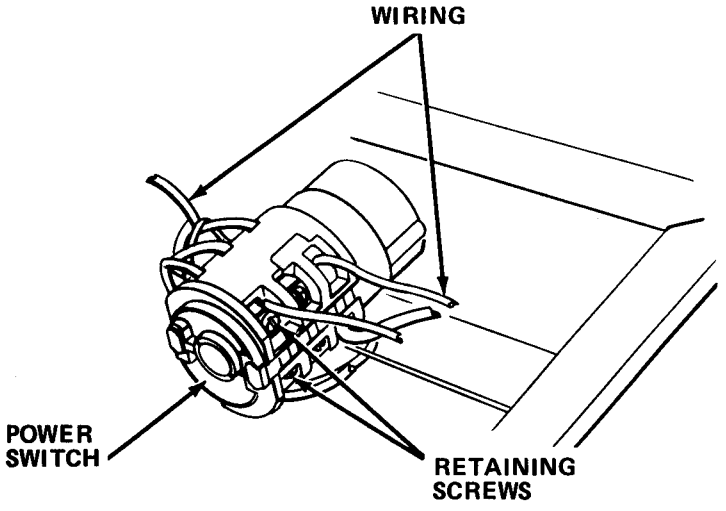
d. Compress spring clips and remove cover plate.

e. Remove retaining screws; tag and remove wiring.



f. Remove retaining screws and switch.

g. Replace switch and retain with screws.



h. Connect wiring. Secure with screws.

i. Reinstall cover plate.

j. Reinstall direction switch knob and retain with screw.

k. Reinstall top cabinet cover and retain with screw.

l. Plug in power cord.

4-20.3 Replace Safety Cover Switch.

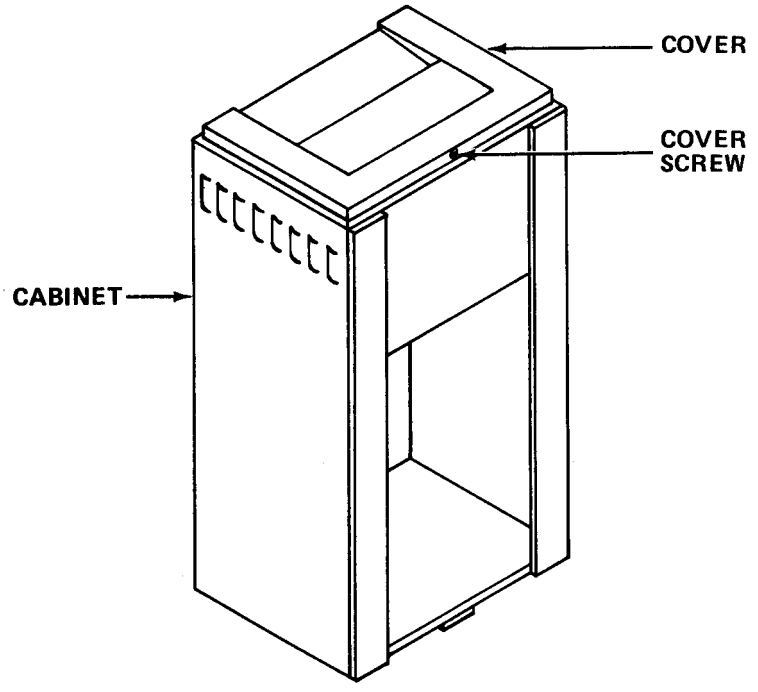
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Safety Cover Switch

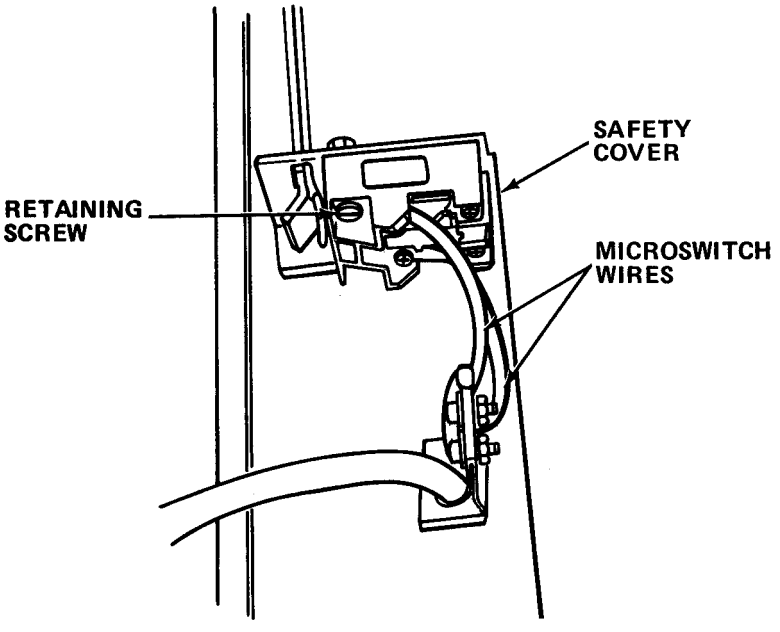
WARNING

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



a. Unplug power cord.

b. Remove top cabinet cover retaining screw. Lift top cabinet cover off of cabinet.



NOTE

Tag electrical connections before removal to be sure of proper reconnection.

c. Tag and remove wiring to safety cover switch on underside of top cabinet cover.

d. Remove screws, washers, and nuts retaining safety cover switch to top cabinet cover. Remove safety cover switch.

e. Replace safety cover switch. Reinstall retaining screws, washers and nuts but do not tighten.

f. Adjust position of switch so that it will activate immediately when safety cover is raised. Tighten screw.

g. Reconnect wiring.

h. Reinstall top cabinet cover.

i. Test operate to be sure safety switch is correctly adjusted.

j. Remove cover and readjust switch as necessary.

k. Install top cabinet cover and retaining screws.

l. Plug in power cord.

4-20.4 Replace Relay.

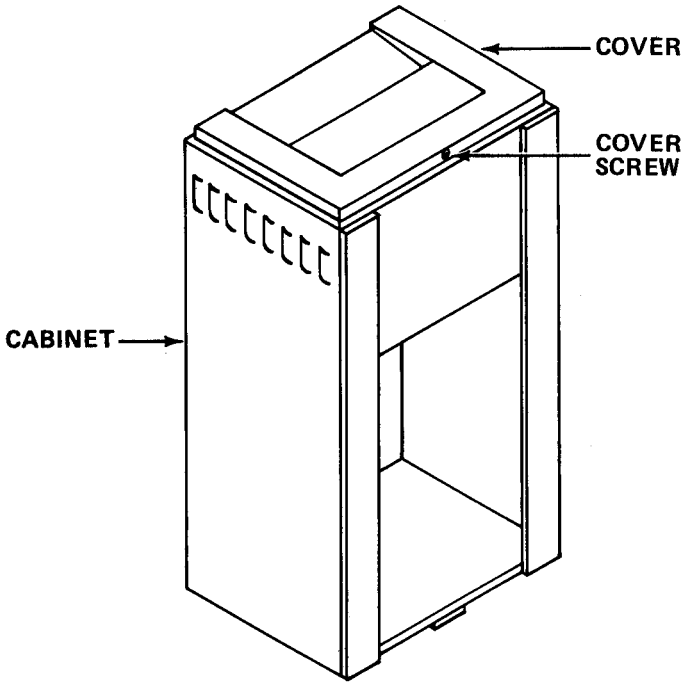
MOS : 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Relay

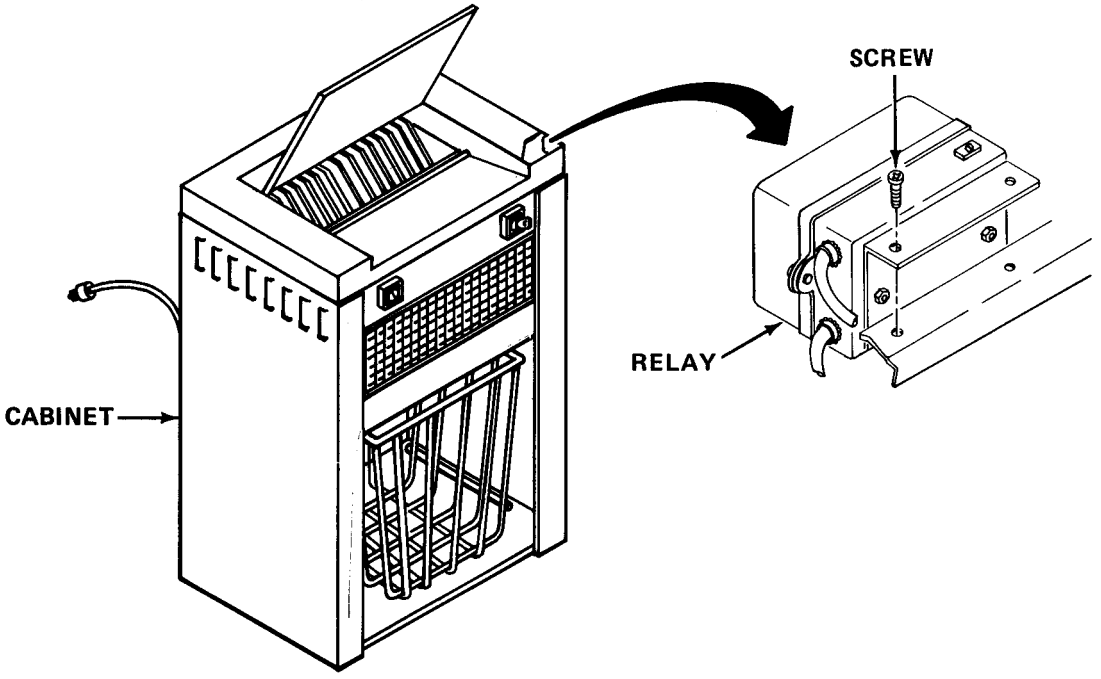
WARNING

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

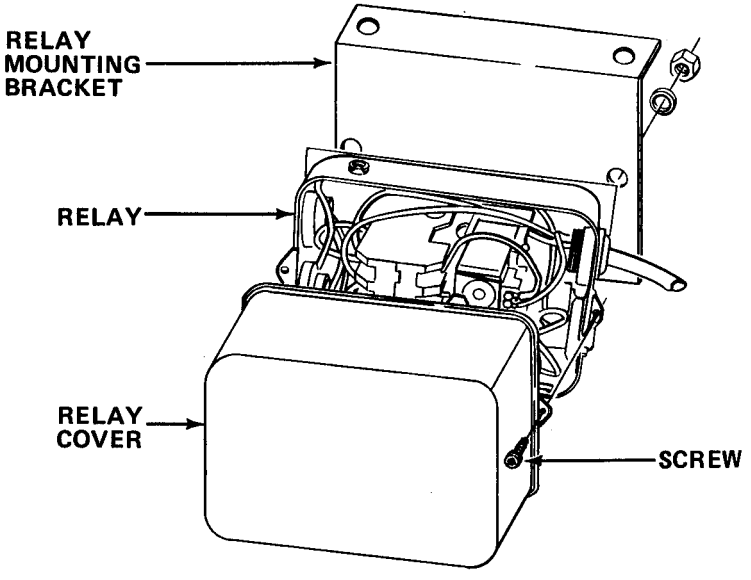


a. Unplug power cord.

b. Remove top cabinet cover retaining screw. Lift top cabinet cover off of cabinet.



c. Remove relay from cabinet.



d. Remove relay cover.

e. Tag and remove electrical harness connections from relay.

f. Replace relay.

g. Reconnect wires.

h. Reinstall cover.

i. Reinstall relay in cabinet.

j. Reinstall top cabinet cover and retaining screw.

k. Plug in power cord.

4-20.5 Replace Wastebasket Overfill Switch.

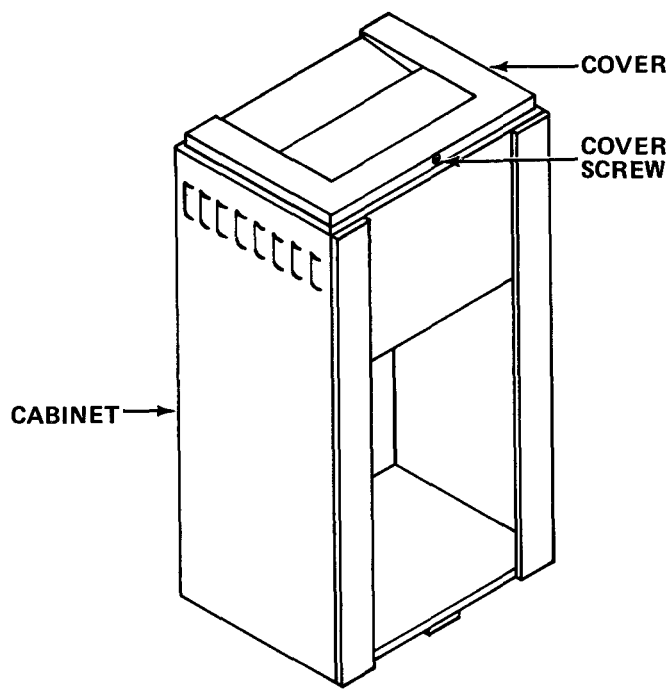
MOS: 83FJ6, Reproduction Equipment Repairer

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

SUPPLIES: Wastebasket Overfill Switch

WARNING

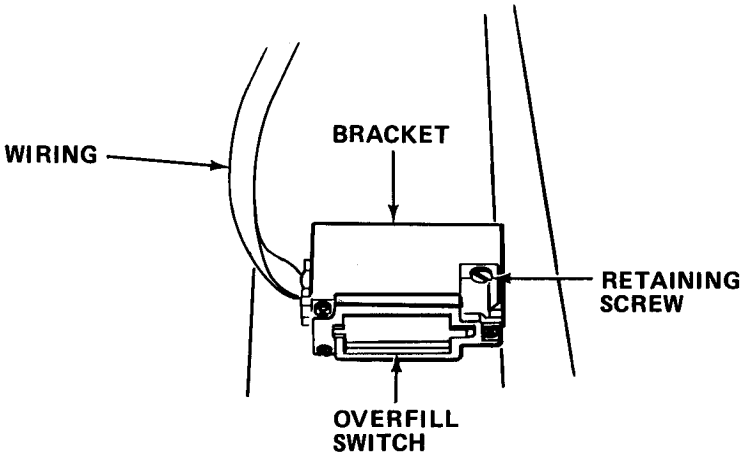
Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.



a. Unplug power cord.

b. Remove top cabinet cover retaining screw. Lift top cabinet cover off cabinet.

c. Remove wastebasket from paper shredder by sliding outward.



d. Remove wastebasket overfill switch retaining screws. Remove switch from bracket.

e. Tag and remove basket overfill switch wiring.

NOTE

Prior to removing the switch, it may be necessary to loosen the four hex head screws holding the paper entry hopper, and remove the hopper.

f. Reconnect wiring.

g. Replace wastebasket overfill switch to cabinet. Reinstall retaining screws and tighten.

NOTE

It may be necessary to reinstall paper entry hopper at this time.

h. Reinstall top cabinet cover. Reinstall retaining screw and tighten.

i. Reinstall wastebasket into cabinet recess.

j. Plug in power cord.

4-20.6 Replace Drive Motor.

MOS : 83FJ6 Reproduction Equipment Repairer

PERSONNEL: Three persons are required to perform this procedure.

TOOLS: Flat Tip Screwdriver
(2 mm to 19 mm) Hex Head Key Socket Set
(6mm to 26 mm) Socket Set
Needle Nose Pliers

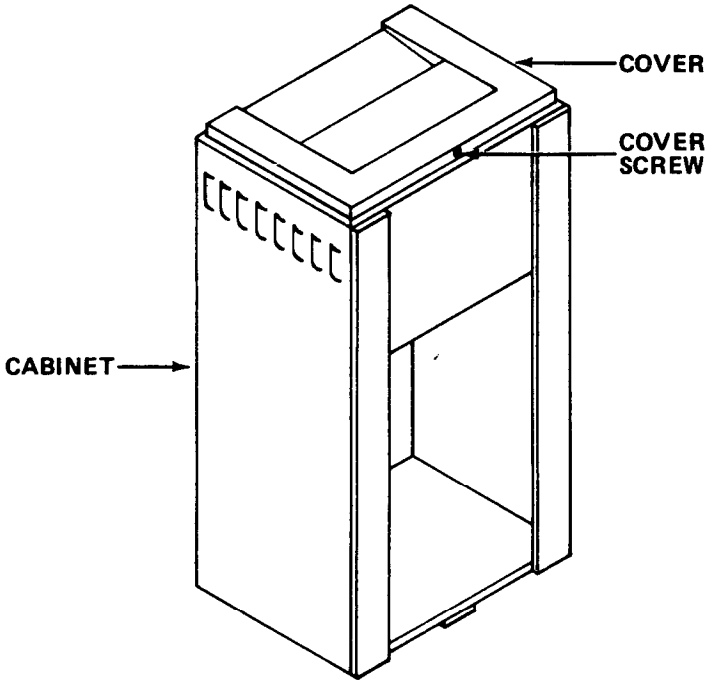
SUPPLIES: Drive Motor

WARNING

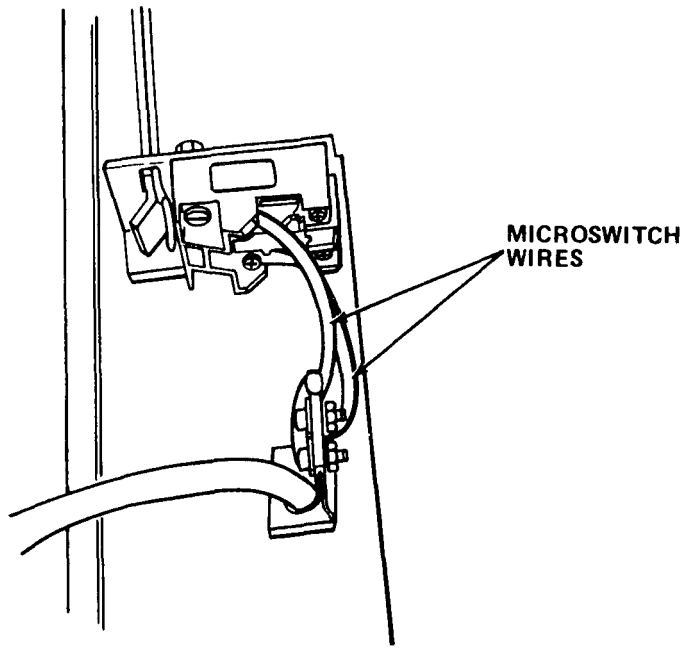
Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Unplug power cord.

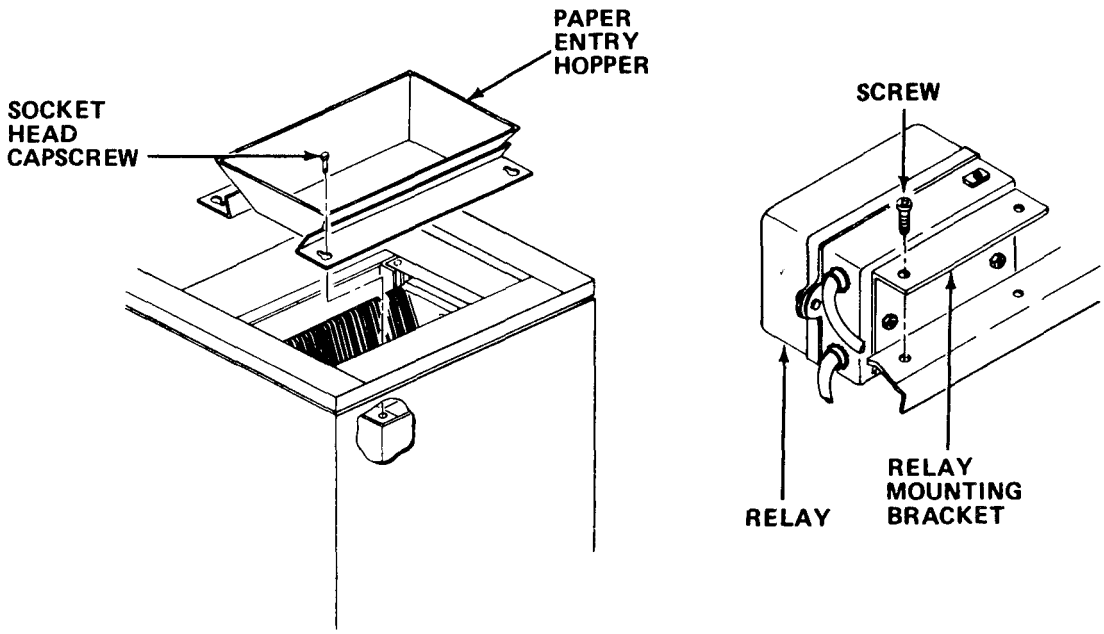
b. Remove mounting bolts, four on the floor and two on the wall, and pull shredder away from the wall.



c. Remove top cabinet cover retaining screw.

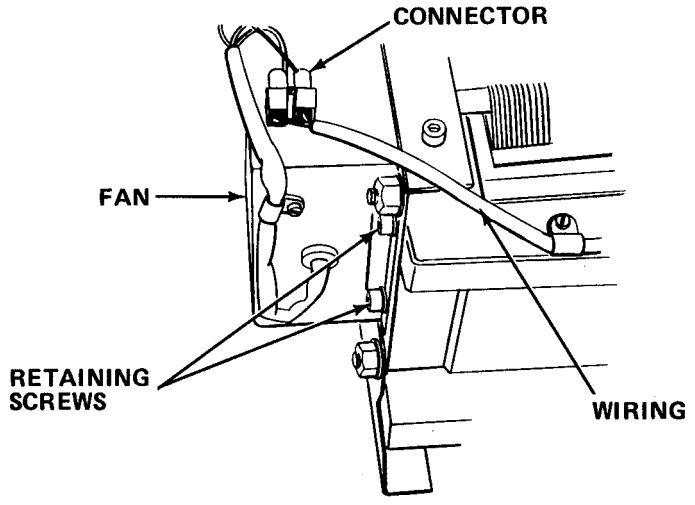


d. Tag and remove microswitch wires from cabinet.



e. Loosen socket head capscrews and remove paper entry hopper.

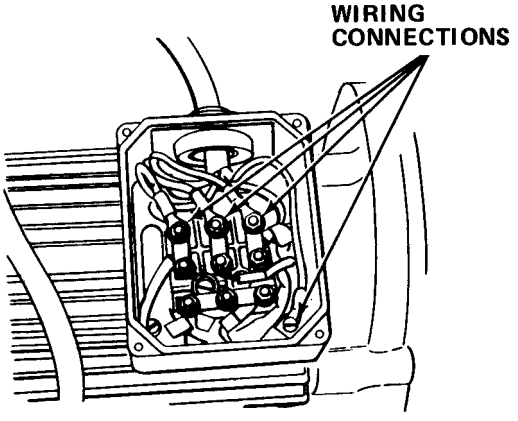
f. Remove relay mounting screws.



g. Remove screws from cable clamps on cutting head.

h. Tag and remove two red wires from top of cooling fan.

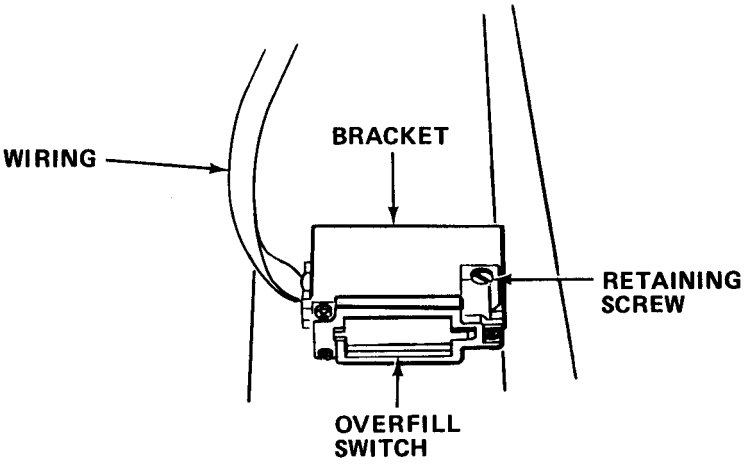
i. Move relay and cord out of the way.



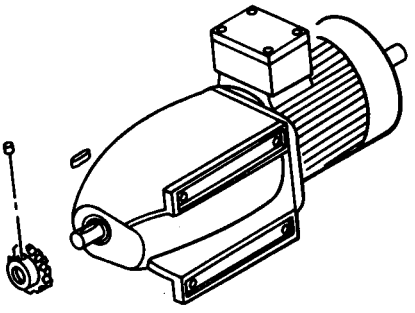
j. Remove screws and cover from junction box on top of motor.

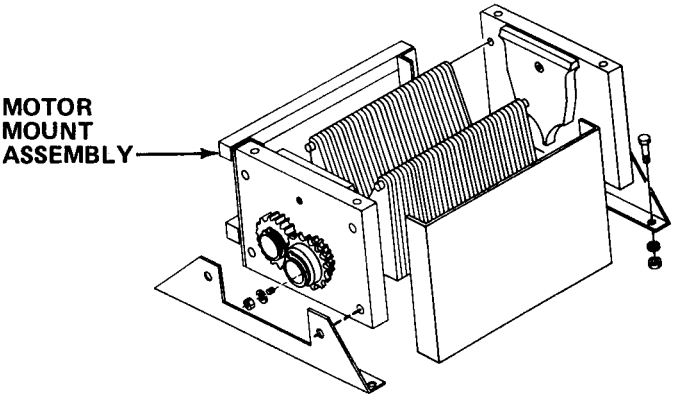
k. Tag and remove four direction switch wires from the junction box. Reinstall junction box cover.

l. Remove screws and nuts from front grill. Remove grill.



m. Remove wastebasket overfill switch from mounting bracket and move switch out of way.





WARNING

Serious injury may occur to hands if the two bottom motor mounting bolts are not removed first.

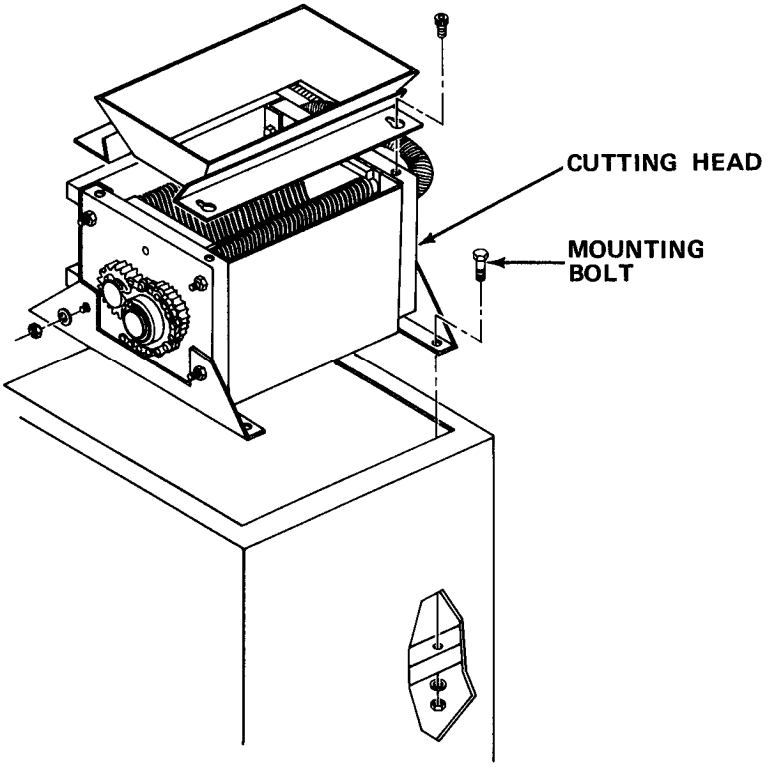
n. Remove two socket head capscrews and two hex head bolts from motor mounting bracket.

o. Remove master link from chain and remove chain.

WARNING

Serious injury may occur from failure to observe proper lifting practices. The shredder motor is heavy. A minimum of two people are required to perform the following step.

p. Carefully lift motor from cabinet and place on a flat work surface.

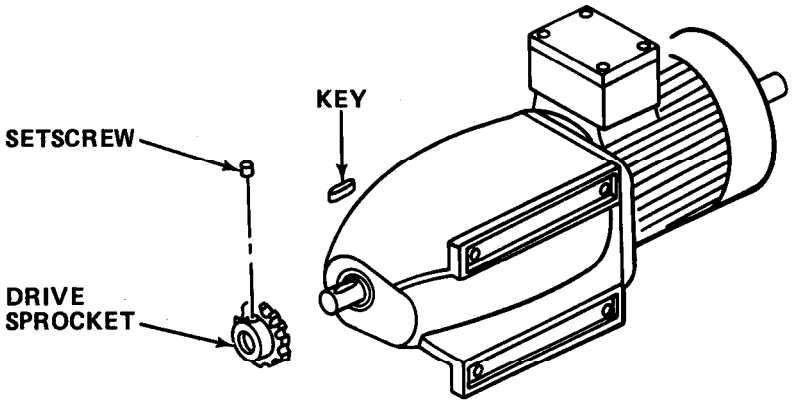


q. Remove four mounting bolts from cutting heads.

WARNING

Serious injury can occur from failure to observe proper lifting practices. The cutting head is very heavy. A minimum of two people are required to perform the following step.

r. Carefully lift cutting head from cabinet and place on a flat work surface.



NOTE

Note position of motor drive sprocket on old motor shaft and reinstall in some position on new motor shaft.

s. Loosen setscrew and remove motor drive sprocket and key from motor shaft.

t. Reinstall motor drive sprocket and key on new motor shaft and tighten setscrew.

u. On the flat work surface, aline new motor with cutting head, and two socket head capscrews and two hex head bolts in motor mounting brackets.

v. Tighten jam nuts on the two hex head mounting bolts.

w. Reinstall chain on drive motor sprocket and cutting head sprocket. Secure with master link.

WARNING

Serious injury may occur from failure to observe proper lifting practices. The motor and cutting head are heavy and awkward to handle. A minimun of three people are required to perform the following step. (Two people will lift, as the third guides the assembly into the shredder cabinet).

x. Carefully lift motor and cutting head assembly into shredder cabinet.

y. Reinstall mounting bolts which secure cutting head to cabinet.

z. Reinstall wastebasket overfill switch on its mounting bracket.

aa. Reinstall front grill.

ab. Remove screws and cover from junction box on top of motor.

ac. Reinstall junction switch wires in motor junction box.

ad. Reinstall junction box cover.

ae. Reinstall two red wires on cooling fan.

af. Reinstall relay on side of cabinet.

ag. Reinstall cable clamps on cutting head.

ah. Reinstall paper entry hopper.

ai. Reinstall wires from top cabinet cover microswitch on terminal board on front of cabinet.

aj. Reinstall top cabinet cover and secure with retaining screw.

ak. Aline shredder on mounts and secure with mounting bolts.

al. Plug in power cord.

4-20.7 Replace Drive Chain.

MOS : 83FJ6 Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver-
Needle Nose Pliers
(4 mm to 17 mm) Hex Head Key Wrench Set

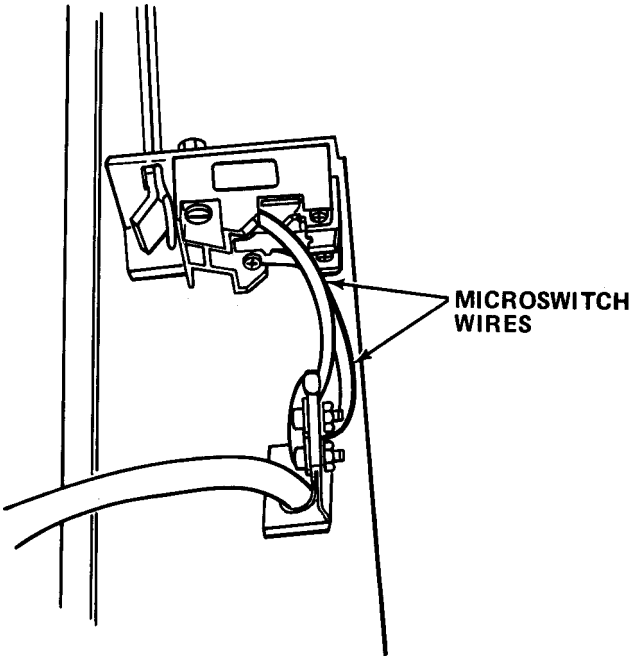
SUPPLIES: Drive Chain

WARNING

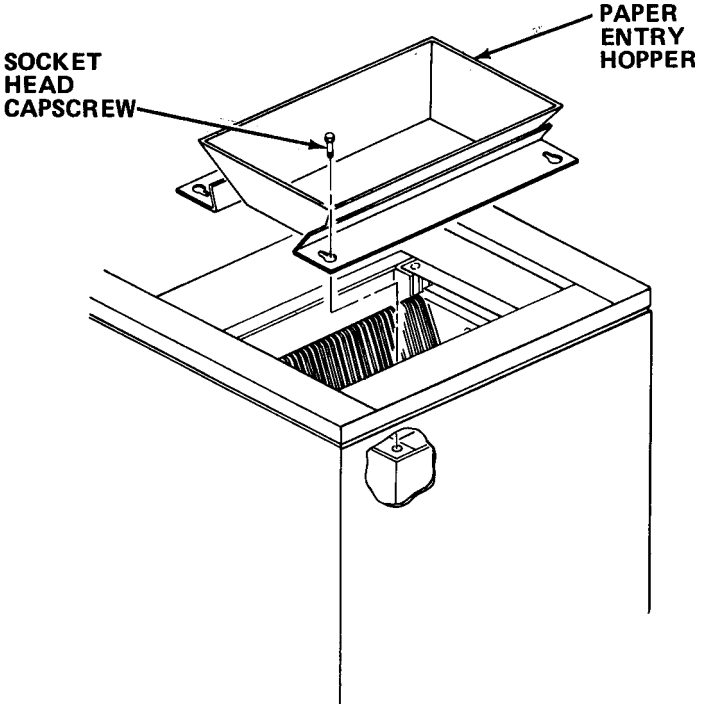
Death or serious injury may occur from electrical shock unless power cord is unplugged before servicing.

a. Unplug power cord.

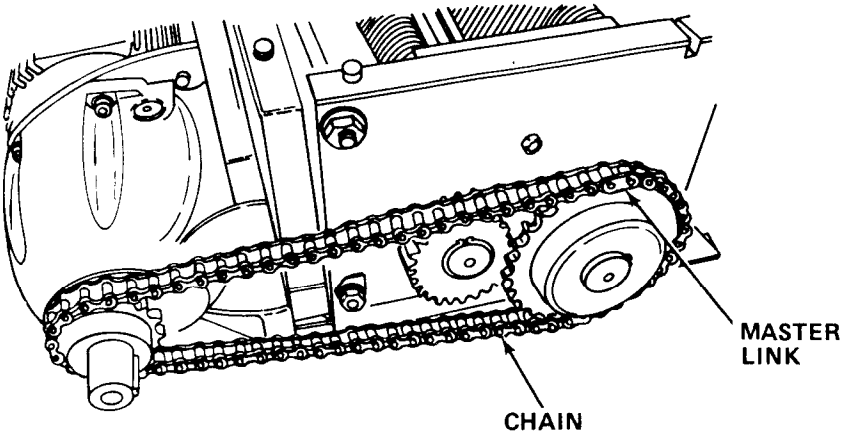
b. Remove top cabinet cover restraining screw and lift cover up.



c. Tag and remove microswitch connections from cabinet. Store cover in a safe place.



d. Loosen socket head capscrews and remove paper entry hopper.



e. Remove master link in chain and lift out old chain.

f. Install new chain and master link.

g. Reinstall paper entry hopper.

h. Reinstall top cabinet cover. Reinstall retaining screw and tighten.

i. Plug in power cord.

4-20.8 Repair Cutting Head.

MOS : 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required for this procedure.

TOOLS : Flat Tip Screwdriver
Tool Kit, Metric
Socket Set, 3/8 in. Drive 6 mm to 26 mm
3/8 in. Drive Extension, 6 in. long
Hex Bit Set (4 mm to 17 mm)
Hex Head Key Wrench Set (2 mm to 19 mm)
3/8 in. Drive Ratchet
Ball Peen Hammer

SUPPLIES: Cutter Blades
Spacers
Cutter Separators

WARNING

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

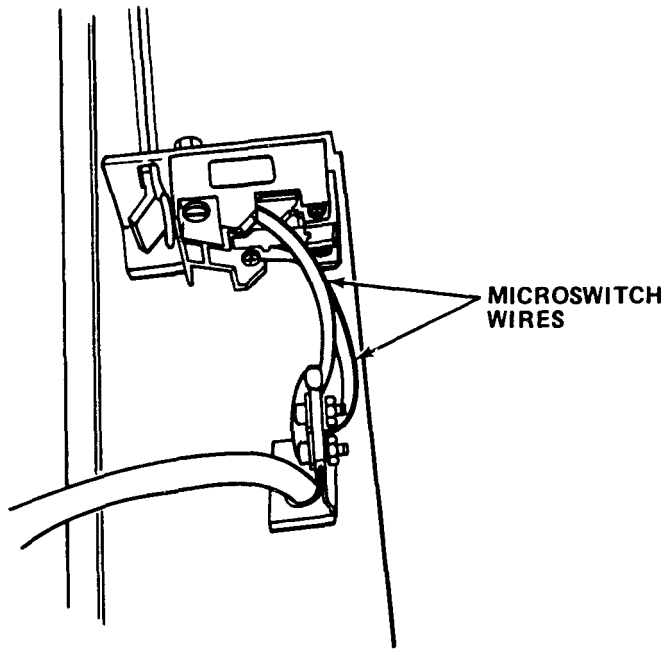
a. Unplug power cord.

b. Remove mounting bolts, four from floor and two from wall. Move shredder away from wall.

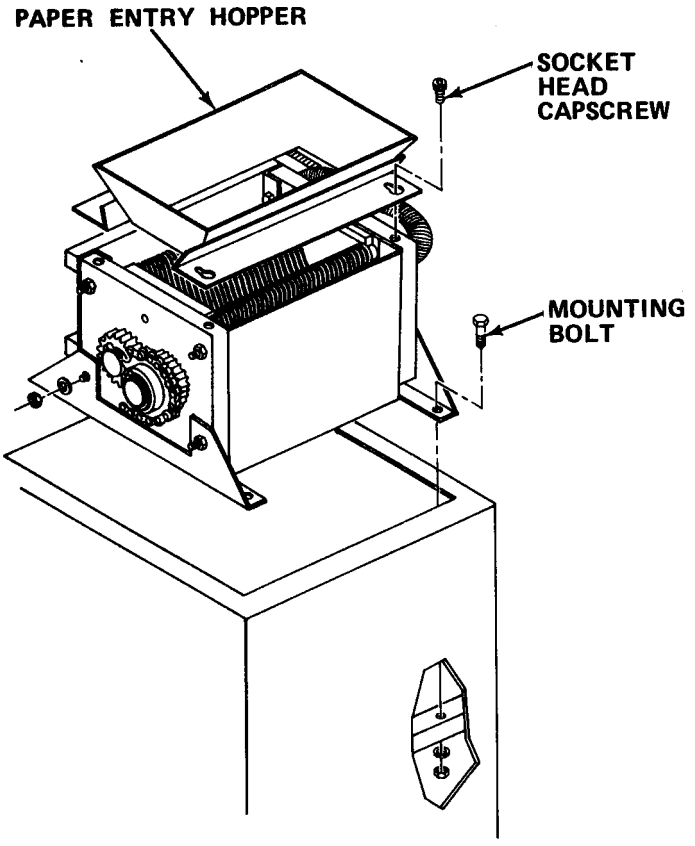
CAUTION

Safety switch and wiring are attached to underside of top cover. Remove cover carefully. Damage to switch or wiring may occur.

c. Remove top cover retaining screw in center rear of shredder and carefully lift off top cover.



d. Tag and remove safety cover switch wires. Set cover aside.



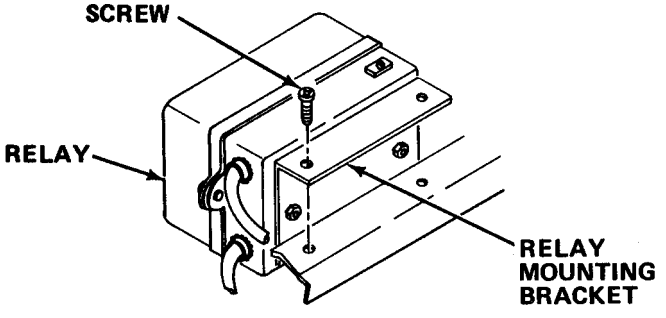
e. Loosen socket head capscrews and remove paper entry hopper.

f. Remove screws and cable clamps from front of cutter assembly.

NOTE

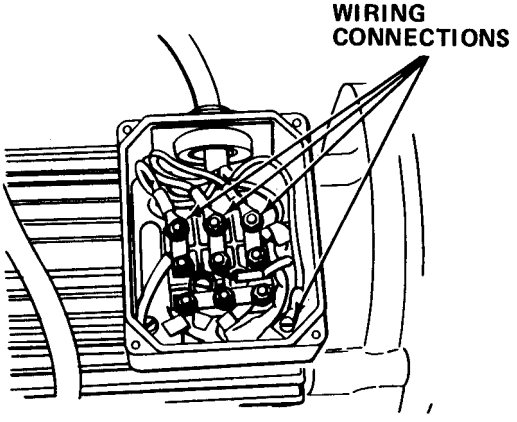
Left and right on shredder are taken when viewed from front of machine.

g. Tag and remove two red wires from top of blower housing attached to left side of cutter assembly.

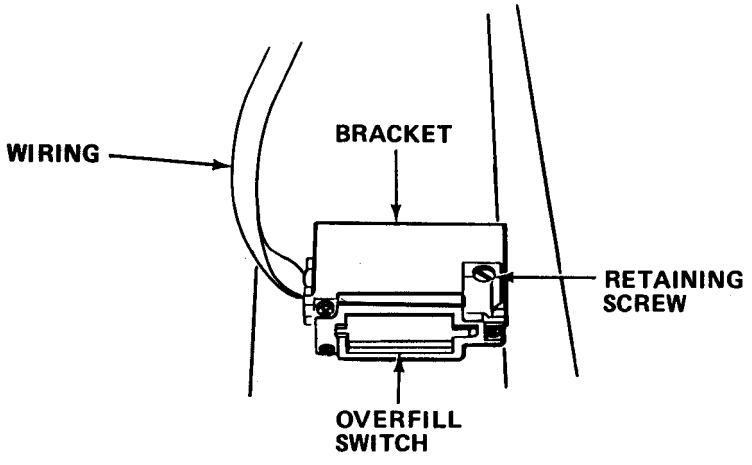


h. Remove relay mounting screws and move relay and cable aside.

i. Remove screws and cover from junction box on drive motor. Unscrew plastic strain relief.



j. Tag and remove four direction switch wires from the junction box. Reinstall cover on junction box.



k. Remove screws attaching basket overfill switch behind cutter assembly. Move switch aside.

l. Remove overfill indicating flap by lifting straight up.

m. Remove cutter assembly mounting bolts, lockwashers, and nuts.

WARNING

Serious personal injury may occur if an inadequate number of personnel are used to remove the drive motor and cutter assembly. Two persons are required to perform this procedure. The drive motor and cutter assembly weigh 160 pounds.

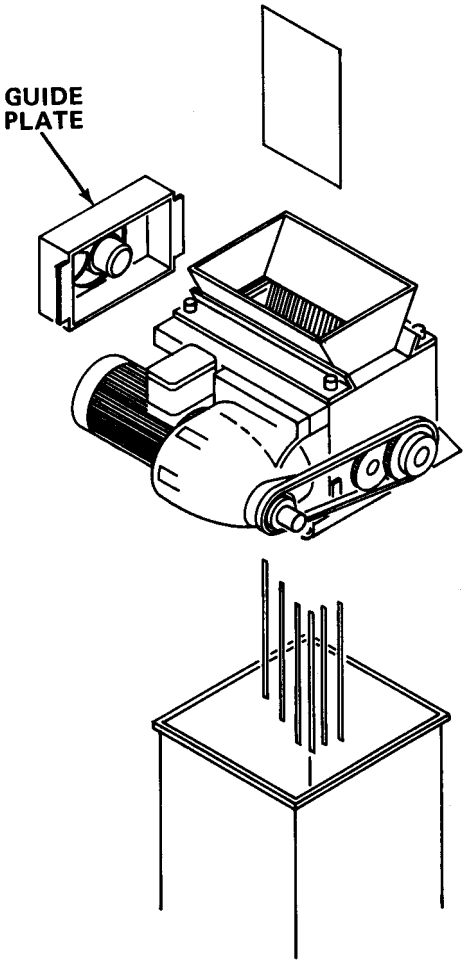
n. Lift drive motor and cutter assembly from the shredder as a unit, and place on suitable work surface.

WARNING

Failure to remove the two bottom motor mounting bolts first can result in injury to hands.

o. Remove one socket head capscrew and one hex head adjusting bolt at bottom of motor mount.

p. Remove one socket head capscrew and one hex head adjusting bolt at top of motor mount, and remove motor and drive chain.



q. Remove socket head screws and fan from left side of cutter assembly.

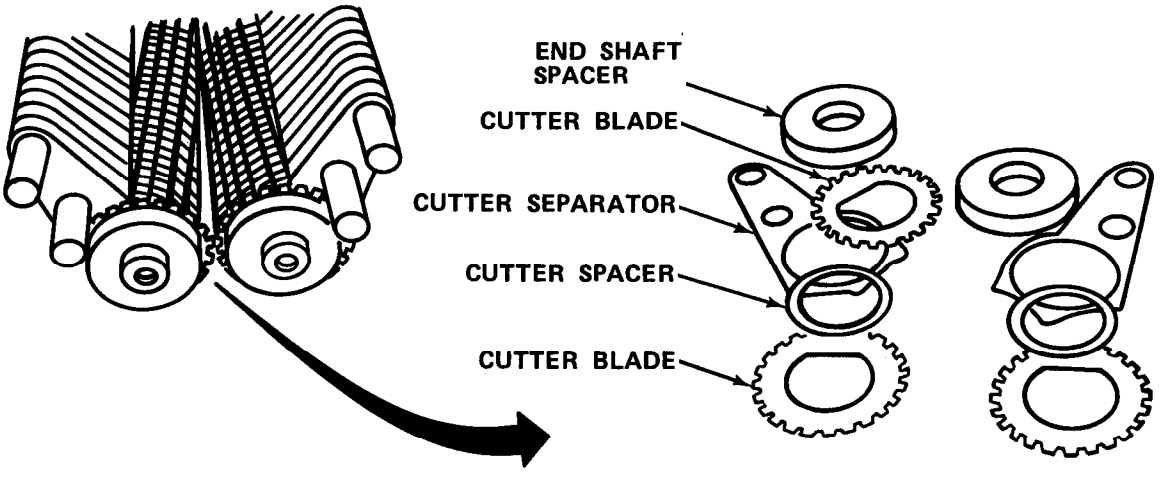
r. Remove shaped guide plate on left side of cutter assembly.

s. Remove two hex head bolts from ends of cutter shafts; then reinstall them back into the shafts for three complete turns only.

t. Remove eight hex head bolts at each corner of both wooden end plates to remove inside and outside cutter shields and mounting frame.

u. Tap left end plate around inside edge with hammer to remove.

v. Remove two hex head bolts from ends of cutter shafts.



NOTE

Components are assembled on cutter shafts in the following order from the bottom (right end): Cutter blade, cutter spacer, cutter separator.

w. Examine each component of the cutter assembly for damage or wear, and replace as necessary.

x. Reinstall wooden end plate by tapping gently with hammer.

y. Reinstall two hex head bolts into ends of cutter shafts.

z. Reinstall inside and outside cutter shields and mounting frame, and secure with hex head bolts.

aa. Reinstall drive motor and drive chain.

ab. Reinstall left shaped guide plate.

ac. Reinstall fan on left end of assembly and secure with socket head screws.

ad. Lift motor and cutter assembly as a unit back into shredder and secure with four mounting bolts, lockwashers, and nuts.

ae. Reinstall basket overfill switch and secure with screws.

af. Reinstall overfill indicating flap.

ag. Remove top cover and thread cable into junction box on drive motor. Secure cable by tightening plastic strain relief.

ah. Reconnect four direction switch wires in junction box and secure cover with four screws.

ai. Reinstall relay and secure with two screws.

aj. Reattach cable with cable clamps at front of cutter assembly.

ak. Reconnect two red wires to terminals on blower housing.

al. Reinstall paper entry hopper and secure by tightening socket head capscrews.

am. Reconnect wires to safety cover switch on top cover.

an. Reinstall top cover and secure with one screw through center rear of machine.

ao. Move shredder against wall and secure with mounting bolts.

ap. Plug in power cord.

4-20.9 Replace Cooling Fan.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
(4 mm to 17 mm) Hex Head Key Wrench Set

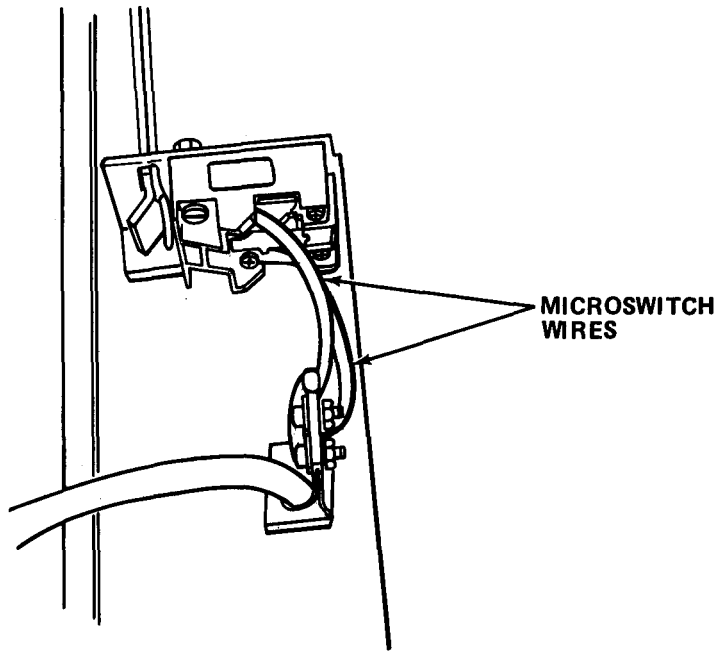
SUPPLIES: Cooling Fan

WARNING

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

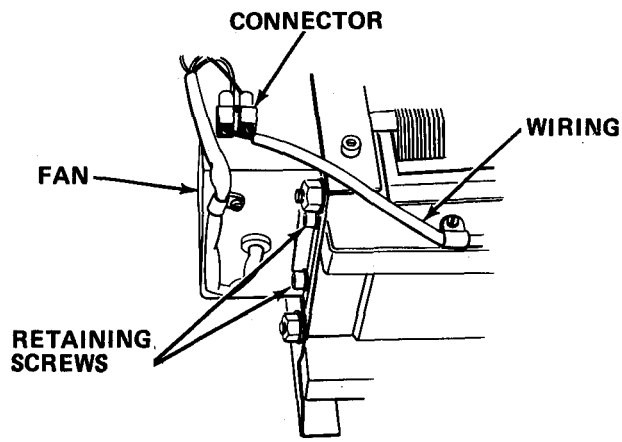
a. Unplug power cord.

b. Remove top cabinet cover retaining screw. Lift cover up.



c. Tag and remove microswitch wires from cabinet. Store cover in a safe place.

d. Loosen socket head capscrews and remove paper entry hopper.



e. Tag and remove two red wires from cooling fan.

f. Remove socket head capscrews and lift out defective cooling fan.

g. Install new cooling fan.

h. Connect wires to cooling fan.

i. Reinstall paper entry hopper.

j. Reinstall top cabinet cover. Reinstall retaining screws and tighten.

4-20.10 Remove/Install Paper Shredder.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS : 9/16 in. Combination Wrench

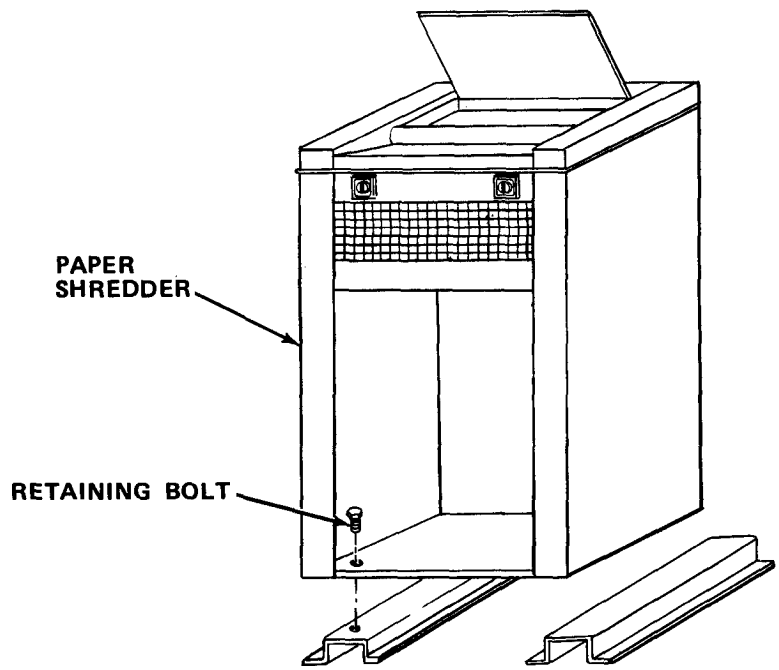
SUPPLIES: Paper Shredder

WARNING

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

a. Unplug power cord.

b. Loosen securing strap and remove wastebasket.



c. Remove bolts and lockwashers holding paper shredder to brackets.

WARNING

Serious personal injury may occur if an inadequate number of personnel are used to remove the paper shredder.

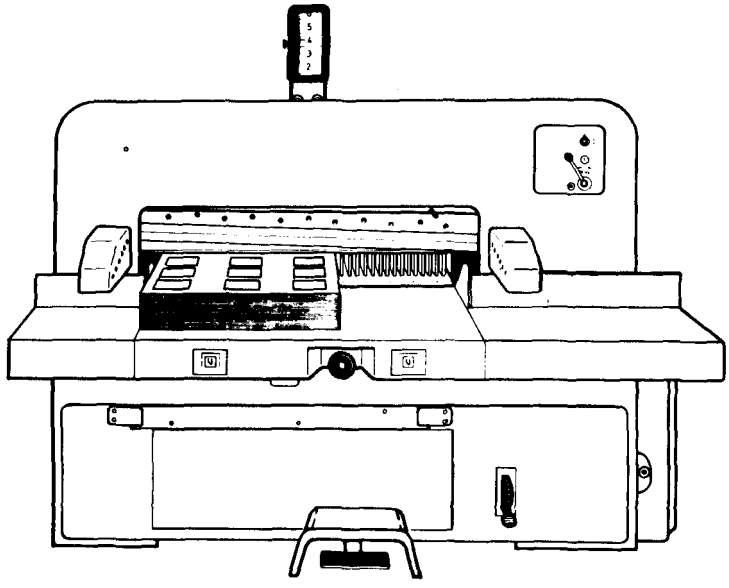
d. Remove defective paper shredder.

e. Aline new paper shredder over holes in brackets.

f. Install lockwashers and bolts.

g. Install wastebasket and secure with strap.

h. Plug in power cord.



CHAPTER 5

92CS PAPER CUTTER

Section I INTRODUCTION

5-1. GENERAL INFORMATION.

5-1.1 Scope.

a. Model Number and Equipment Name. Model 92 CS and 92 SD Paper Cutter.

(1) Operation and maintenance procedures for the Model 92 CS are contained in Sections I through V of this chapter.

(2) Operation and maintenance procedures for the Model 92 SD are contained in Sections VI through X of this chapter.

b. Purpose of Equipment. To cut multiple thicknesses of paper, or similar materials.

5-1.2 Reference Information.

Nomenclature Cross-Reference List

Official Nomenclature	Common Name
OMI	Optical Measurement Indicator
OCL	Optical Cutting Line
Pc	Printed Circuit (Card)
NC	Normally Closed
NO	Normally Open

5-2. EQUIPMENT DESCRIPTION.

5-2.1 EauiDment Characteristics, Capabilities, and Features.

a. Direct optical measurement indicator.

b. One hand control for setting measurements.

c. Optical cutting line indicator.

d. Repaceable knife.

e. Light barrier interference detector for safety.

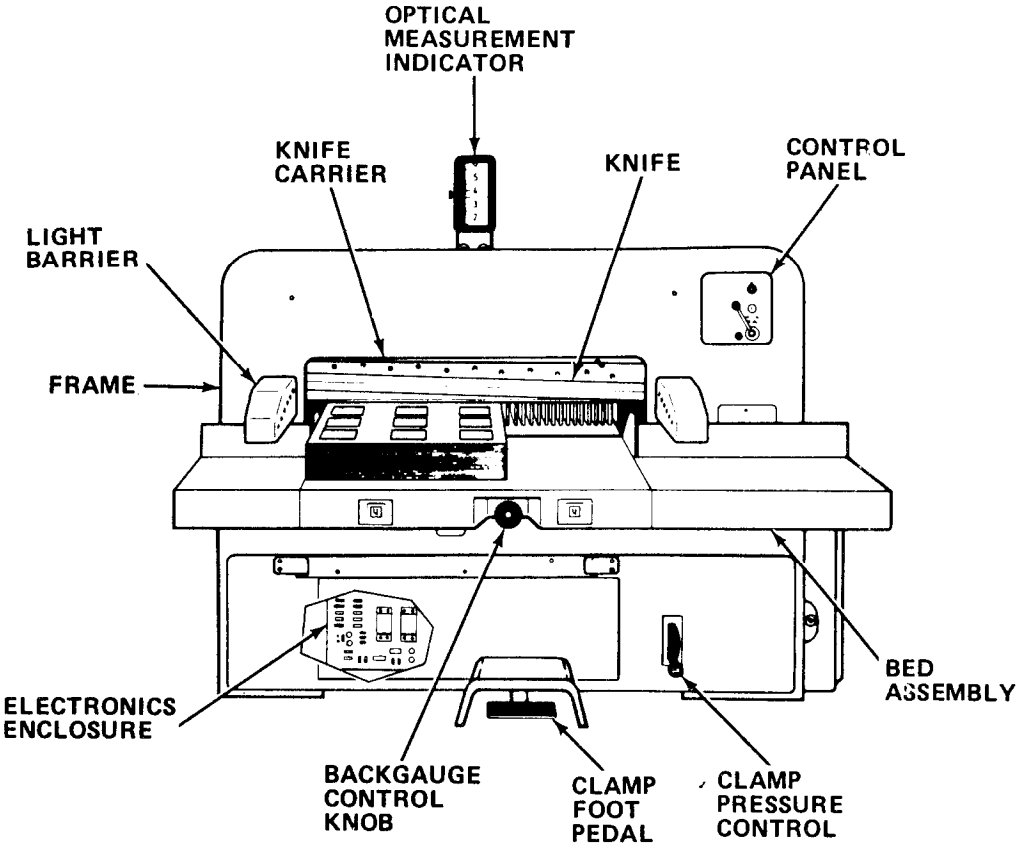
f. Simultaneous two-hand operation interlocks.

g. Three-section backgauge rake enables one-time setup for three cuts.

h. Two-stage clamping pressure for safety.

i. Safety bolt to automatically lock knife in its upper position for safety,

5-2.2 Location and Description of Major Components.



FRAME. Cast-iron, rigid structure contains all the assemblies.

LIGHT BARRIER. Light beams, if broken, immediately stop downward motion of the knife for safety.

KNIFE CARRIER. Contains and supports knife.

OPTICAL MEASUREMENT INDICATOR. Indicates distance from knife to backgauge.

KNIFE. Beveled-edge tempered steel blade which performs actual cutting operation.

CONTROL PANEL. Contains on/off controls, and knife change control.

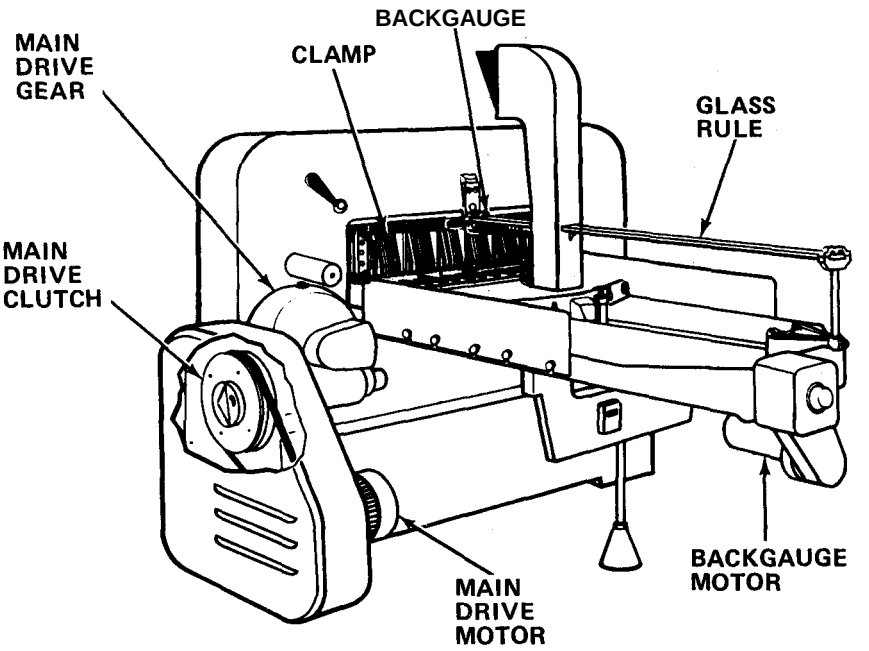
CLAMP PRESSURE CONTROL. Adjusts paper clamp pressure.

BED ASSEMBLY. Contains backgauge and supports material to be cut.

CLAMP FOOT PEDAL. Controls the clamp.

BACKGAUGE CONTROL KNOB. Controls the forward and backward motion of the backgauge.

ELECTRONICS ENCLOSURE. Controls electronic signals for cutting operation.



MAIN DRIVE CLUTCH. Engages main drive gear to perform cut.

MAIN DRIVE GEAR. Drives knife carrier to perform cut.

CLAMP. Forces air from between layers of paper to ensure smooth, even cut.

BACKGAUGE. Moves material to be cut forward or backward in relation to knife.

BACKGAUGE MOTOR. Powers backgauge.

MAIN DRIVE MOTOR. Drives main drive gear and clutch assembly, and the hydraulic pump.

GLASS RULE. Used by OMI to indicate position of backgauge. Adjustable.

5-2.3 Equipment Data.

Cutting Width	92 cm (36-1/4 in.)
Clamp Opening	11 cm (4-5/16 in.)
Feed Depth	92 cm (36-1/4 in.)
Smallest cut without false clamp	20 mm (13/16 in.)
with false clamp	9 cm (3-1/2 in.)
Knife Cutting Size Limitations (Recommended)	
Pile Height	6 cm (2-11/32 in.)
Material in front of knife	40 cm (15-5/8 in.)
Material Width	64 cm (25-5/16 in.)
Clamp Pressure - minimum	150 daN* (330 lbs)
maximum	3000 daN* (6600 lbs)
Foot Pedal Operation	50 Kg (110 lbs)
Width without side tables	177 cm (70 in.)
with side tables	186 cm (73-1/2 in.)
Length	211 cm (83 in.)
Height	147 cm (58 in.)
Front Table Length	61 cm (24 in.)
Table Height	90 cm (35-1/2 in.)
Net Weight	1856 kg (4083 lbs)
Frame Weight	1200 kg (2646 lbs)
Table Weight	410 kg (904 lbs)
Static Floor Load	810 daN*/m^2 (166 lbs/sq. in.)
Contact Area Load	1.5 daN*/cm^2 (21 lbs/sq. in.)
Power Requirement (Main Drive)	3 kW (4.1 hp)
Supply Voltage	190 - 240 V 3 phase
Fusing	$25A_2$
Wire Cross Section	4mm (0.156 $in.^2$)
Dynamic Surcharge	20%

Knife	
Thickness	11.7mm (7/16 in.)
Blade Angle	22°
Gap between knife and clamp (full pressure on clamp)	.20 - .35 mm (.007 - ,013 in.)
Play between knife carrier and frame	.05 mm (.002 in.)
knife carrier and front plate	.05 mm (.002 in.)
Grinding reserve	3 cm (1-3/16 in.)
Backgauge	
Speed	8 cm/sec (3-1/8 in./sec)
Overrun	0.6-l.2mm (.023 - .047 in.)
Rake Spring Tension	Max tightness, then back-off 1/2 turn
With brake engaged, gap between brake disc and solenoid carrier	0.1 - 0.15mm (.0039 - .0058 in.)
With brake disengaged, gap between brake disc and clutch linings	0.2 mm (.0078 in.)
Spring length with correct load on brake	4.5cm (1.775 in.)
Brake disc tilt (at circumference)	0.15 - 0.20mm (.0058 - .0078 in.)
Gear Assembly	
Teeth play (at outside circumference of drive wheel)	7 cm (2.755 in.) Max
Hydraulics	
Oil Capacity	17 L (4.48 gal)
Oil Operating Temperature	40°- 50°C (104 - 122°F)
Change-over pressure (knife changing)	28 bar (398 psi)
Clutch Pressure	65 bar (924.5 psi)
Clamp Pressure	32 bar (455 psi) Min. 130 bar (1848 psi) Max.
Safety Pressure (foot pedal operations)	21 bar (298 psi)

Electronics

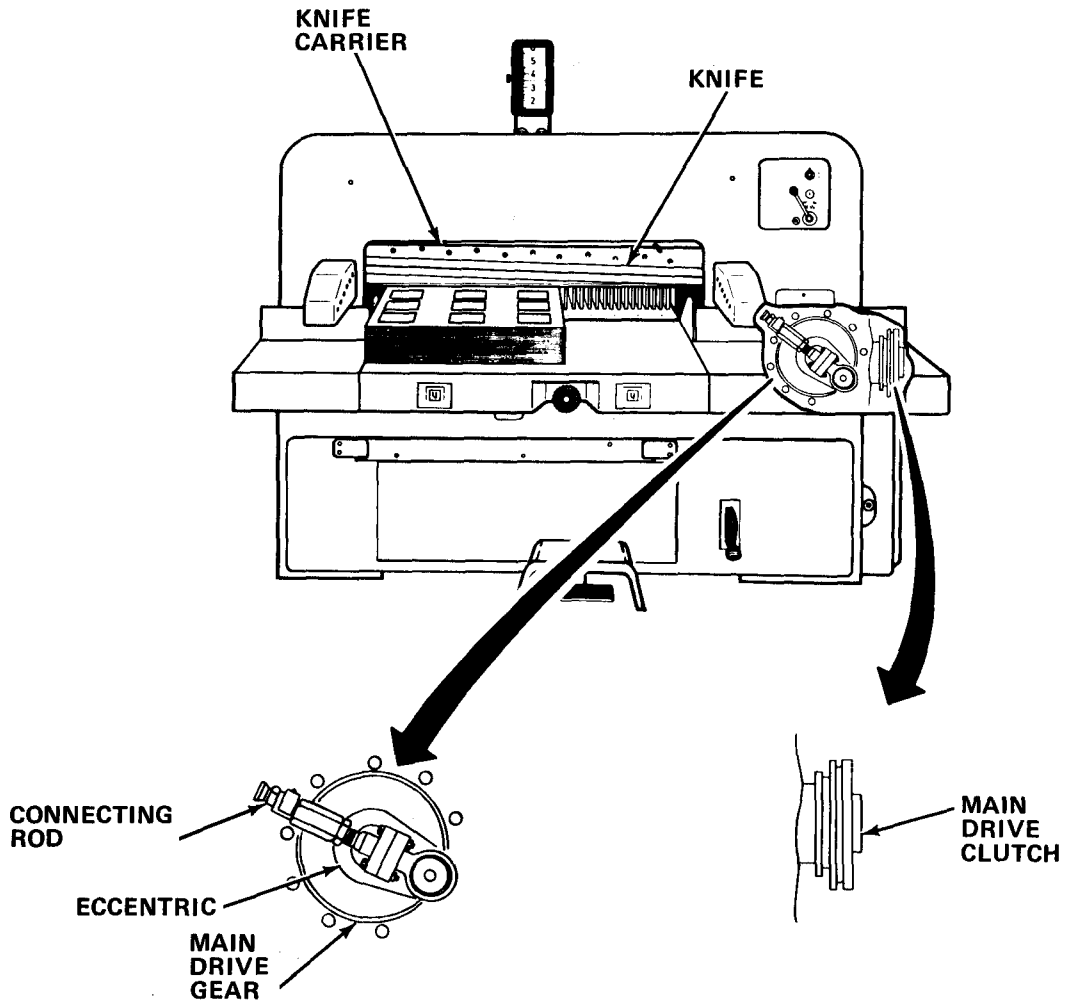
Digital signal levels

"1" or "True"	2.5 V dc
"0" or "False"	0 - 0.8 V dc
Light barrier photoelement voltage	
With photoelements uninterrupted	.12 V dc Max
With photoelements interrupted	.5 V dc Min
Light barrier lamp voltage	5.8 V ac

*daN=kp

5-3. TECHNICAL PRINCIPLES OF OPERATION. The function of the paper cutter is to cut multiple thicknesses of paper, or similar materials. It consists of:

5-3.1 Knife Assembly. Performs the actual cutting. It is comprised of:



a. Main drive clutch. Controlled by the hydraulic system. Couples the main drive gear to drive motor and drives the knife. Brakes stop the main drive gear when hydraulic pressure is released.

b. Main drive gear. Converts high rpm from the clutch to low rpm at the eccentric.

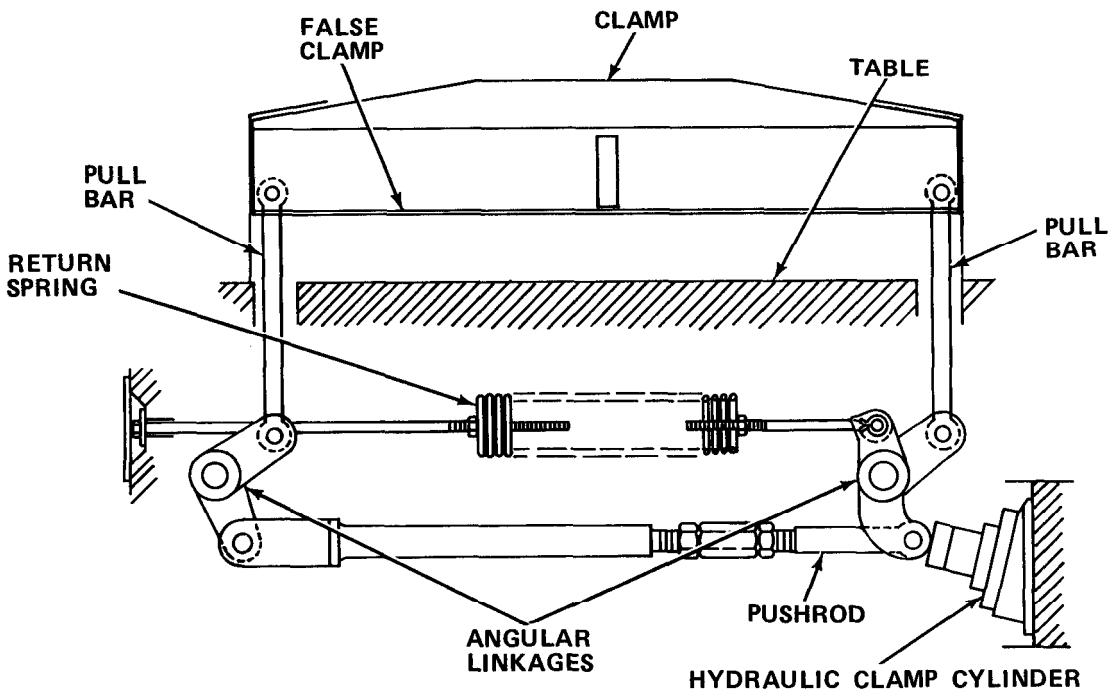
c. Eccentric. Converts rotary motion from the main drive gear into linear motion.

d. Connecting rod. Linkage between eccentric and knife carrier. Pulls the knife downward at a 45° angle to perform cut. It contains two shear bolts that are designed to break if the knife carrier cannot complete its cut due to jamming.

e. Knife carrier. A cast-iron structure which supports the knife. It rides in two machined grooves which give it a shearing motion when pulled down by the connecting rod.

f. Knife. A beveled-edge, tempered-steel plate that is mounted to the knife carrier and performs the actual cut.

5-3.2 Clamp Assembly. Hydraulically activated. Clamps material tightly to force air out and hold in-position for cutting. It is comprised of:



a. Clamp. Presses and holds the material. Located behind the knife. Moves up and down. Returns to starting position by means of a spring fitted to the right angular linkage. Clamp rides in adjustable side guides.

b. Hydraulic clamp cylinder. Pushes the clamp downward via system of angular linkages and pulling bars. Protrudes from right side of machine and presses right angular linkage (paragraph 5-3.5e).

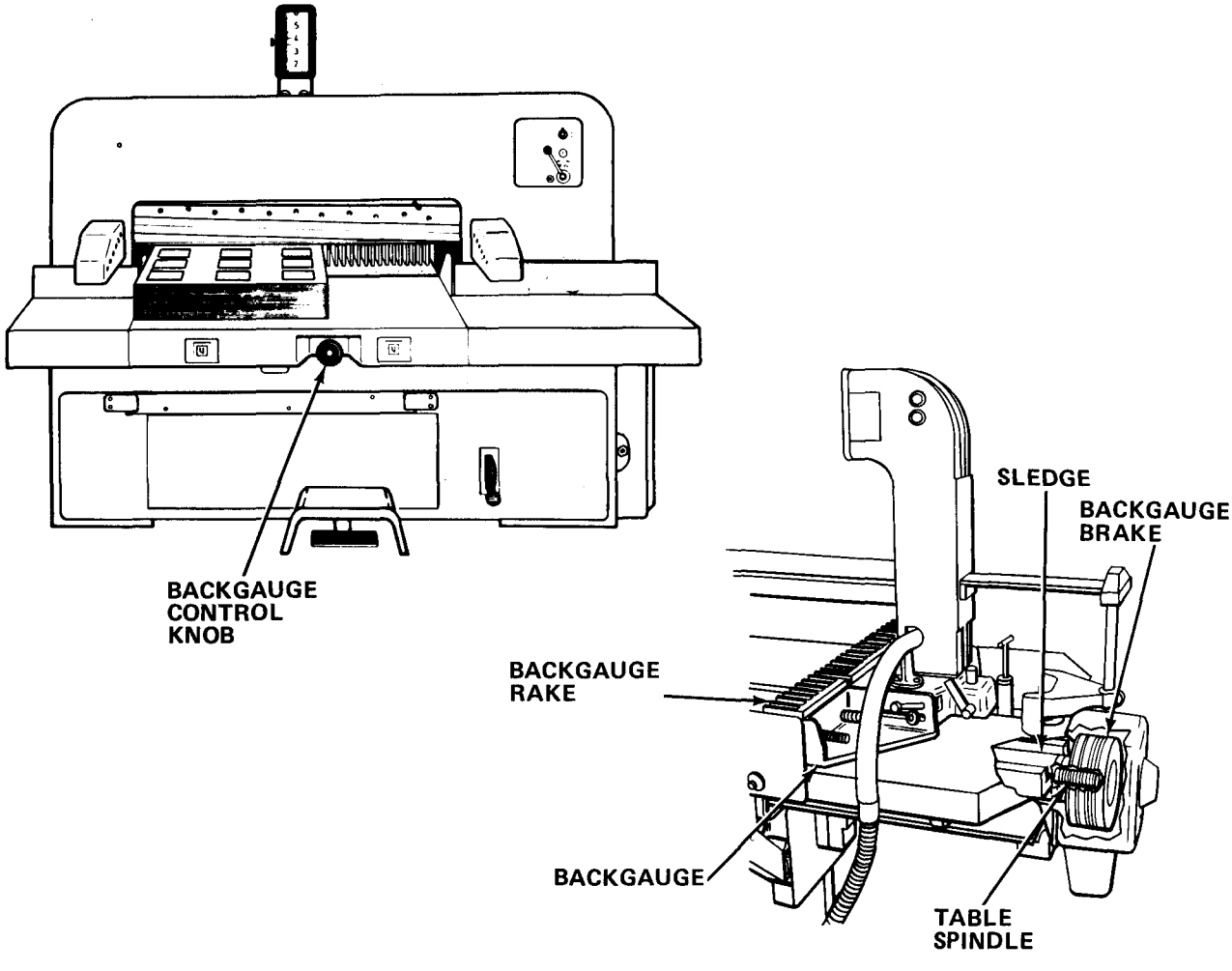
c. Angular linkages. Control downward motion of the clamp. Connected to the clamp via two pull bars. The other side of the linkages are connected to push rod. The hydraulic clamp cylinder pushes on the push rod linkage. This forces the push rod to move to the right; linkages pull the pull bars and the clamp down via the pivots.

d. Push rod. Transmits force of hydraulic cylinder to angular linkages. A turnbuckle is used to adjust the clamp parallel to table, to ensure motion of clamp is horizontal.

e. Return spring. Applies force to right linkage to reverse motion of push rod and push clamp back up. Mounted on a rod attached to left side of machine frame. Tension on spring is adjusted via rod.

f. False clamp. Provides larger clamp surface to prevent damage to paper.

5-3.3 Backgauge Assembly. Adjusts length and maintains the cutting material parallel to knife. It is comprised of:



a. Table Spindle. A threaded rod which moves the sledge in the table. Driven by the backgauge motor, or manually via the backgauge control knob.

b. Sledge. Moves on ground guides in table slot. Driven by table spi ndle, it protrudes through the table slot and connects to backgauge.

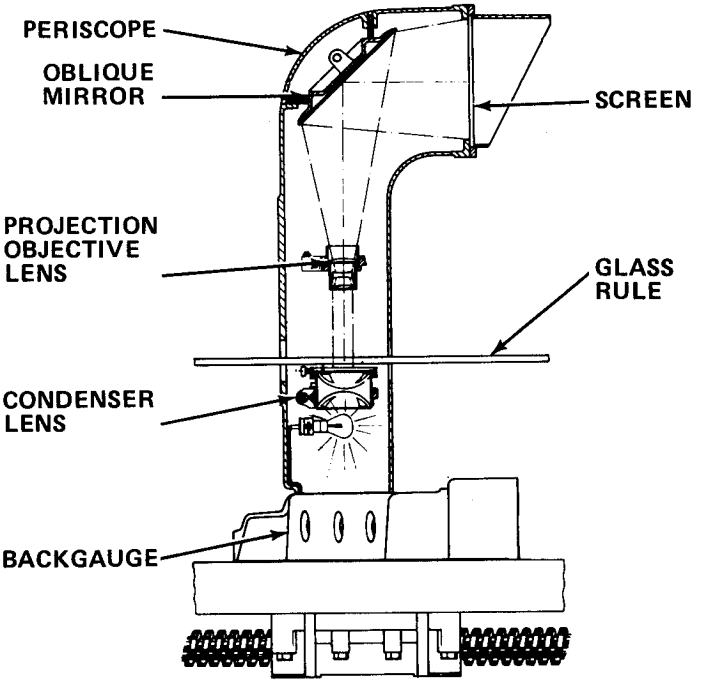
c. Backgauae. Rests on the table top. Connected to the sledge and moves with the sledge. Adjustable to maintain parallelism and squareness with cutting knife.

d. Backgauge rake. Three piece cast structure mounted to front of backgauge. Lower sides of rake are ground at an angle and spring loaded to prevent material from escaping under rake fingers. The left and right rakes are adjustable (forward or backward) to allow for setting of three different measurements at one time.

e. Backgauge control knob. Controls movement of backgauge (forward and backward) both electrically and mechanically. Pull knob out or press button in to move the backgauge automatically. When the knob is pressed inward, it engages a gear on the table spindle. Rotating the knob manually rotates the gear, which moves the backgauge.

f. Backgauge brake. Rapidly stops spindle rotation when backgauge control knob is released (paragraph 5-3.6i).

5-3.4 Optical Measurement Indicator (OMI) Assembly. Moves synchronously with backgauge rake to give direct measurement indication of the distance from the backgauge rake to the knife cut. It is comprised of:



a. Glass rule. Transparent glass rule scaled in inches. It is clamped at the back of the machine frame and the end of the table. It runs through the middle of the periscope housing. The measurement mark on the rule is projected onto the OMI screen, giving the distance from the front edge of the backgauge rake to the cutting line.

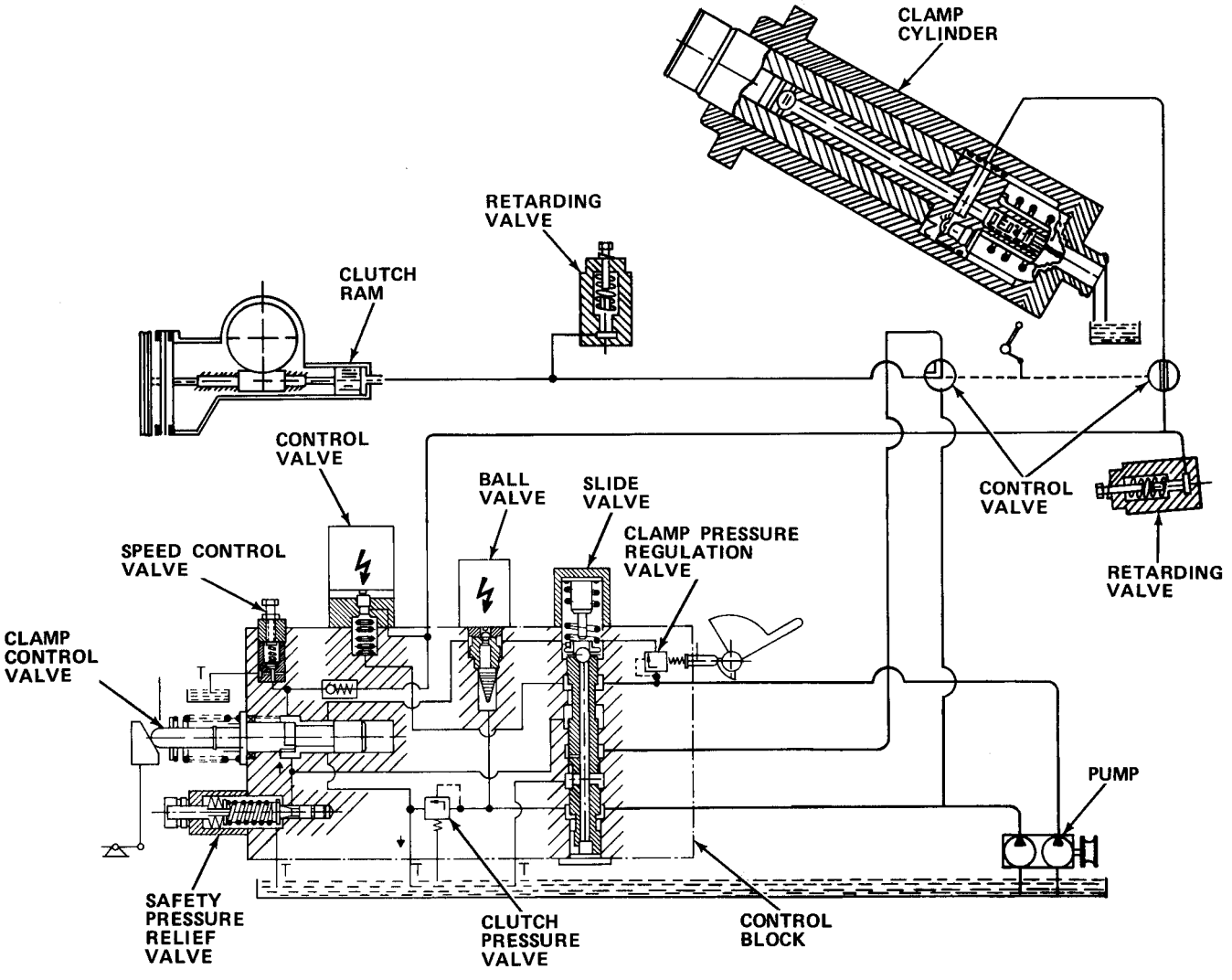
b. Periscope. Houses OMI components. Mounted on rear of backgauge. The glass rule runs through a slot in periscope.

c. Condenser lens. Mounted below glass rule. Focuses light through glass rule and into periscope housing.

d. Projection objective lens. Magnifies, focuses and projects the glass rule marks onto the OMI screen via the oblique mirror.

e. Screen. Positioned at top front of periscope. Displays projected image of glass rule markings.

5-3.5 Hydraulic System. Operates clamp hydraulic cylinder and main drive gear clutch . It is comprised of:



a. Pump. Located in the reservoir pillar and driven by the main drive motor through a V-belt and pulleys. The pump draws hydraulic fluid out of the reservoir through a filter and supplies it under pressure to the hydraulic system via two ports, P_1 and P_2.

b. Control block. Located beside the reservoir pillar, it controls the activation and force of the clamp and the main drive clutch ram. It is comprised of:

(1) Safety pressure relief valve. Sets the pressure of P_1 pump flow through control unit during foot pedal operations by opening if the safety pressure is exceeded.

(2) Clamp control valve. Controlled by a cam on the clamp pedal. When activated it directs P1 pump flow in control unit to allow clamp cylinder to extend with a maximum force, not to exceed the safety pressure.

(3) Conical valve (Y315). When open, allows hydraulic oil to flow to the clamp cylinder. The valve is open during foot pedal operations, and downward knife motion. During the knife's upward motion, the valve is closed to lock the clamp down until the knife reaches the top of its stroke. Then the valve is open to allow hydraulics to flow back to the reservoir.

(4) Ball valve (Y27). This valve is open when not energized to allow free hydraulic flow through the control block. This valve is energized and closed when the cutting buttons are depressed. Closing the valve allows hydraulic pressure to build up in the control block to activate the slide valve. This will allow maximum clamp pressure as set by the clamp pressure regulation valve. Once the slide valve is fully activated, the hydraulic fluid is then routed to the clutch to allow cutting.

(5) Clutch pressure valve. Is an adjustable valve that regulates pressure of P_2 pump flow to clutch. The valve opens and releases flow if a preset pressure is exceeded.

(6) Clamp pressure regulation valve. An adjustable valve controlled by the clamp pressure control pedal. Varies the P_1 pump flow pressure and, therefore, varies the clamping pressure during cutting operations.

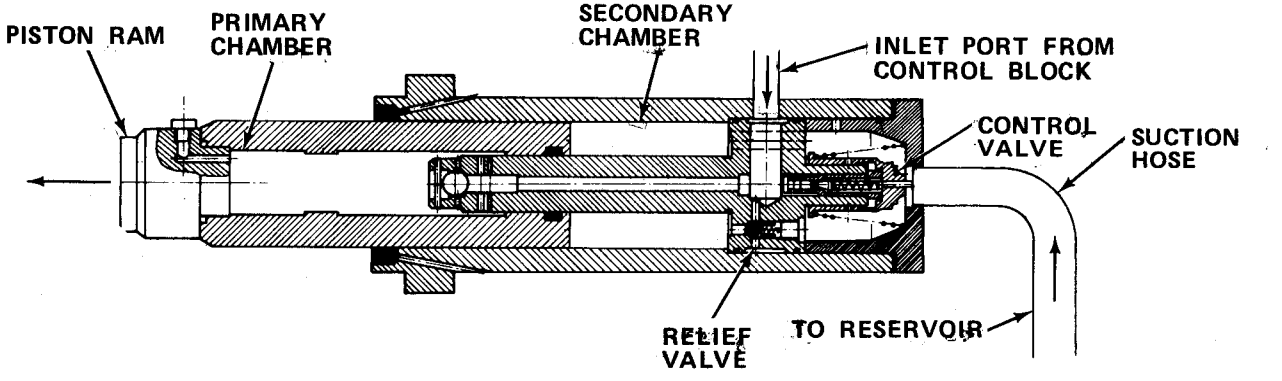
(7) Slide valve. Controls the fluid flow in the control unit. During idle running, the ball valve (Y27) is open, conical valve (Y315) is closed, and P_1 and P_2 pump flow passes through slide valve and back to reservoir. When solenoid valves are activated, P_2 pressure increases and forces slide valve up. When this occurs, P_2 flow is routed out P_2K port to engage the clutch ram. P_1 flow is directed to the clamp cylinder and controlled by the pressure regulation valve only, bypassing the clamp control valve. The output of pressure to P_2K is delayed slightly (the time it takes the slide to be moved) which allows the clamp pressure to build up first.

(8) Speed control valve. Controls the clamp's downward speed when using the clamp foot pedal by regulating the hydraulic flow. Can be adjusted for faster or slower operation.

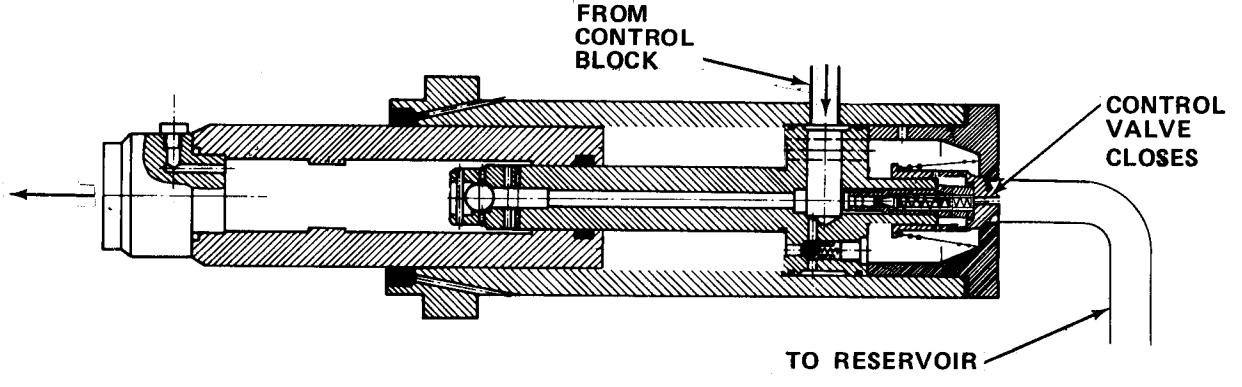
c. Control valve. A five-way valve used when changing knife. With lever in cutting position, the main drive clutch ram is connected to control block connection P_2K, and the P_1 connection is connected to the clamp cylinder. With lever in knife change position, the main drive clutch ram is connected directly to the P_2 pump line, and P_1 pump line to the clamp cylinder is interrupted. This allows the knife carrier to be-moved to a convenient position for a knife change without moving the clamp.

d. Clutch ram. Uses hydraulic pressure from control block to engage a friction clutch on the drive pulley and causes rotation of main drive gear.

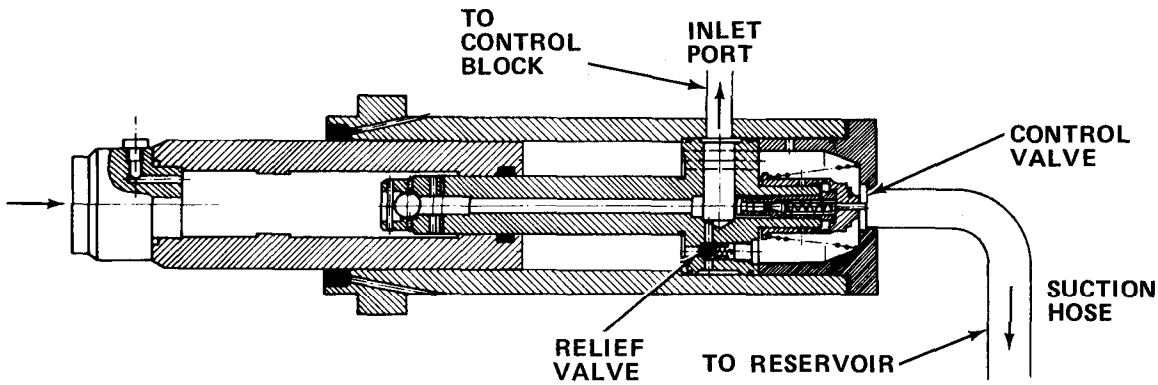
e. Clamp cylinder. Converts hydraulic fluid pressure to linear motion to move clamp down. The cylinder operates in two stages to allow for fast downward movement of the clamp and high clamping force.



Fluid under pressure enters the cylinder inlet port and travels down the center section into the primary chamber, forcing the piston ram outward. At the same time, a vacuum is created in secondary chamber and fluid is drawn from reservoir through suction hose.



When the clamp contacts the material, fluid pressure to inlet port increases, the valve closes and fluid is ported past the valve into the secondary chamber. The pressure equalizes in both chambers and the force of the piston ram is increased.

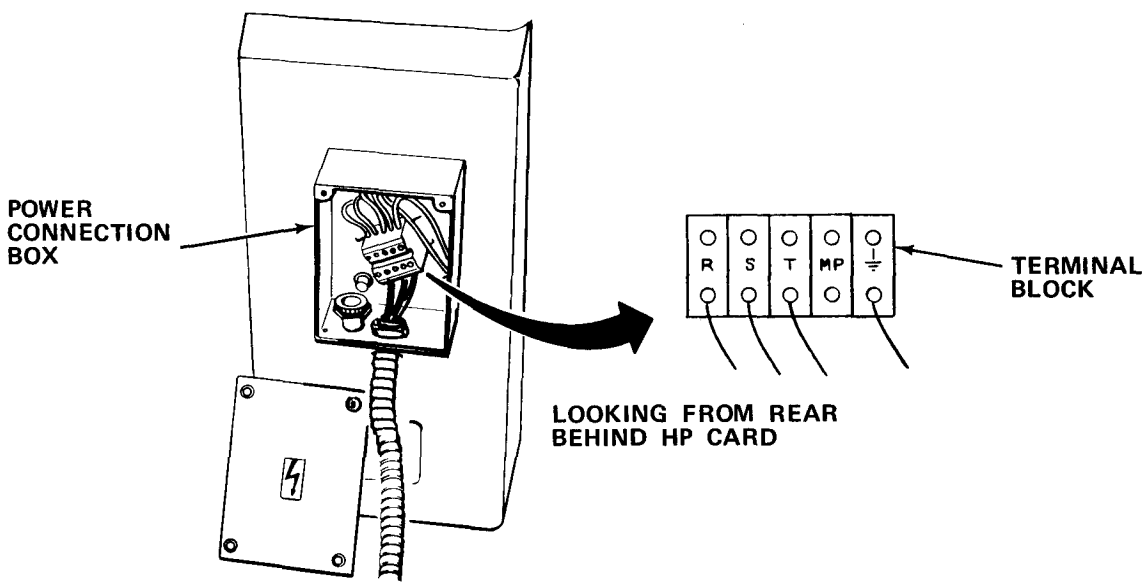


Once the cut is complete, the inlet port fluid pressure decreases. The clamp return spring forces the piston ram inward and the relief valve opens to channel fluid out of the inlet port. Once the fluid pressure decreases past the activation setting of the control valve, the valve opens to channel excess fluid out the suction hose.

f. Retarding valves. Located in the plumbing to the clamp cylinder and the clutch ram. During the upward clamp movement, the valve allows hydraulics to flow back to the reservoir at an even pressure to allow smooth return of the clamp. When hydraulics are flowing to the clutch ram, the other retarding valve allows for a smooth and even flow of hydraulic fluid.

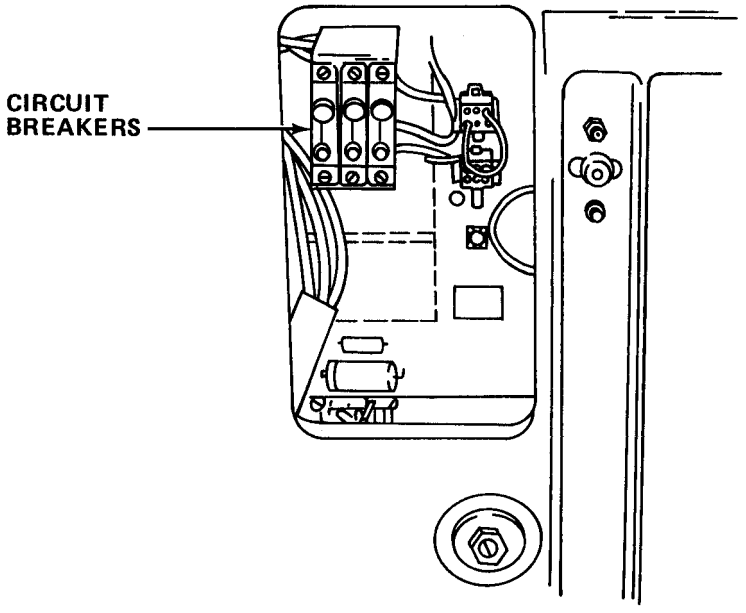
5-3.6 Electronic System. Activates, powers, and controls the hydraulic and mechanical components of the paper cutter. (Refer to Table 5-3 for the sequence of operation of circuitry in response to basic operations.) It is comprised of:

a. Power connection box. Supplies 220 V ac, three-phase power to machine. The machine is hard-wired to a breaker/fuse box and protected by a 25 amp fuse.



The power connection box contains a terminal block where the input lines, labelled R, S and T, and a ground wire are connected. Wires connected to the other side of the terminal block carry the input power to the main distribution PC card HP via the main power switch.

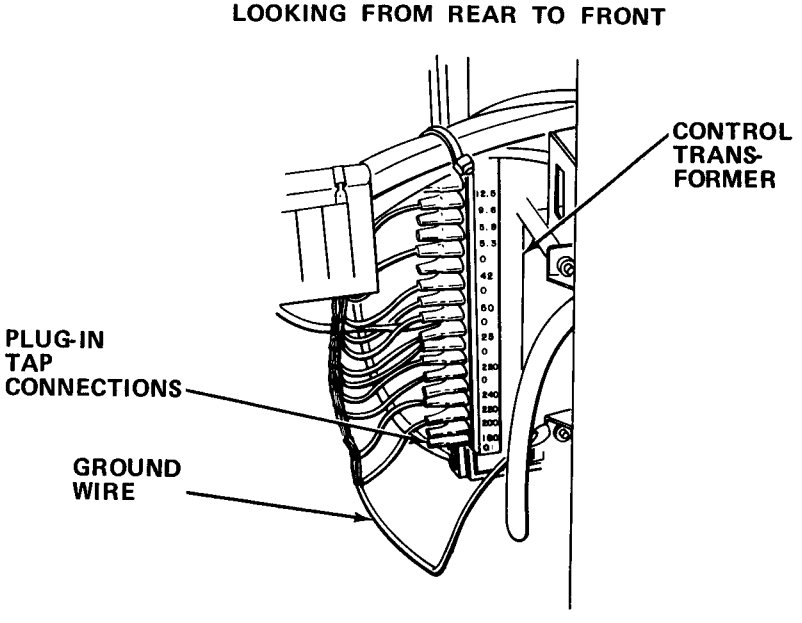
b. Main distribution card HP. Controls the distribution of power within the system. It is comprised of:



NOTE

References in parentheses ( ) refer to the identification for the unit used on the schematics.

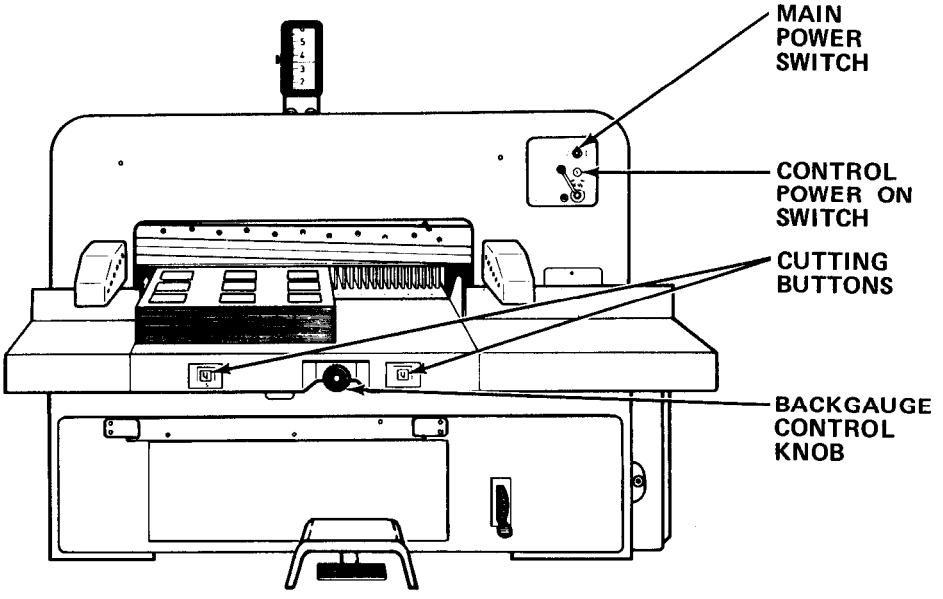
(1) Main circuit breakers. Three 10 amp circuit breakers protect the machine from power surges.



(2) Control transformer. Has input taps for adjusting to multiple voltages. The primary winding has tap connections for 180, 200, 220, and 240 V. The taps on the secondary windings provide voltages of 12.5, 6.2, 5.8, 9.5, 7.2, 6.5, 25, 32, 42, 50, and 220. Total power output of transformer is 500 W. The control transformer supplies power to other components in the system via a standard control (ST) PC in the electronics enclosure.

(3) Control power on relay (d304). Coupled with the control power on switch (d292), the control power on relay controls the application of power to the control transformer. Pressing the control power on switch energizes the relay, which closes its N.O. contacts and allows power to flow to one side of the control transformer.

c. Operating switches. Provide operator control of the system. There are six operating type switches:

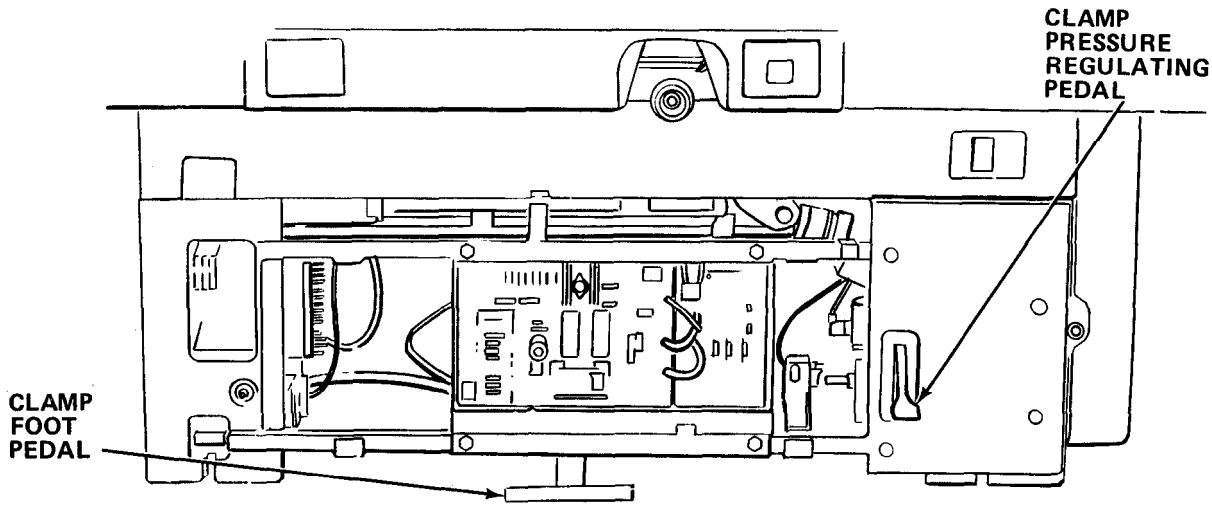


(1) Main power switch. Primary power switch. A three-pole direct switch that applies power to the main drive motor, fluorescent lamp switch, contractors controlling the backgauge motor, and the control power on switch.

(2) Control power on switch. Energizes the light barrier and the PC cards in the electronics enclosure via the control power on relay. Activation of the PC cards enables operation of the hydraulic system solenoids. Power cannot be applied to the control power on switch unless the main power switch is closed.

(3) Cutting buttons. Controls the knife, via the hydraulic system. Pressing both buttons within 0.5 seconds applies power to the contractors and relays controlling operation of solenoids in the hydraulic system control block.

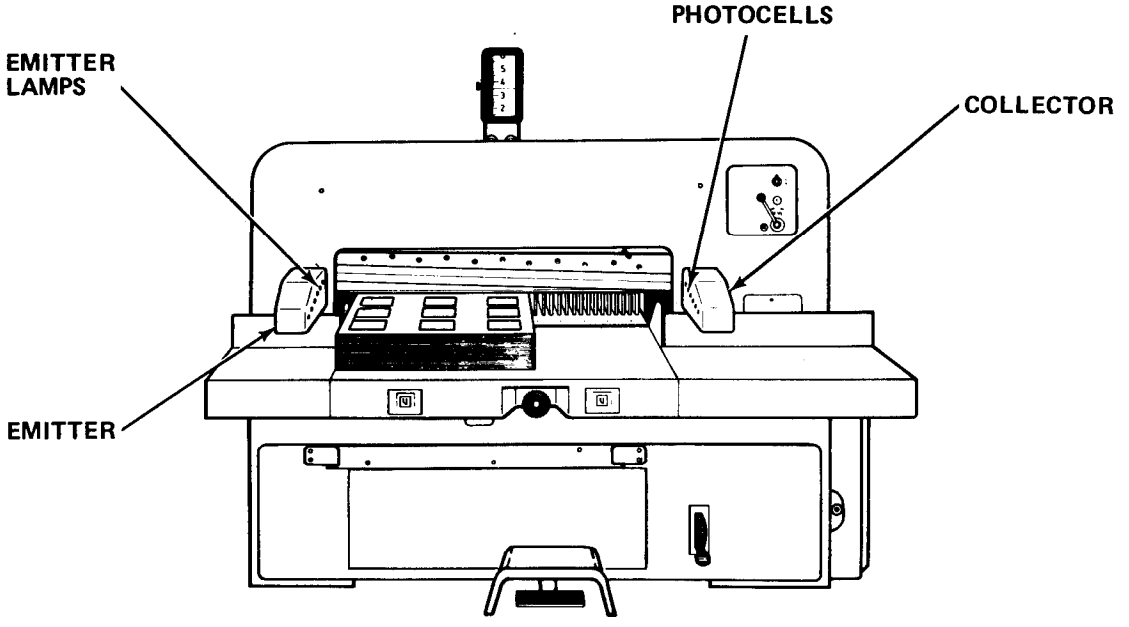
(4) Backgauge controls. Controls movement of backgauge, via a control knob, limit switches, and a button. The control knob is mounted on one end of a metal rod, with a toothed gear on the other end, and a trip dog cam mounted on middle of rod. Two microswitches are mounted next to trip dog cam. Pushing the control rod in will control the contacts on one switch (b18), and pulling it out will control the contacts of the other switch (b10). Pushing the control knob in activates switch (b18) which disengages the backgauge brake. The toothed gear engages a toothed gear on the table spindle. This allows turning of the knob to finely adjust the position of the backgauge. Pulling the control knob out activates switch (b10) which allows the backgauge motor to turn in a direction that allows the backgauge to move forward. Pressing the button in the middle of the control knob activates switch (b14). Activating this switch allows the backgauge motor to turn in a direction that allows the backgauge to move back.



(5) Clamp foot pedal . Controls operation of the clamp. When pressed, trip dogs mounted on pedal axle close clamp pedal switch (b309) and press in clamp control valve in hydraulic system control block. This initiates sequences of operation (Table 5-3) in the electronics and hydraulics that control operation of the clamp when using the foot pedal.

(6) Clamp pressure regulating pedal. Used to adjust the pressure of the clamp.

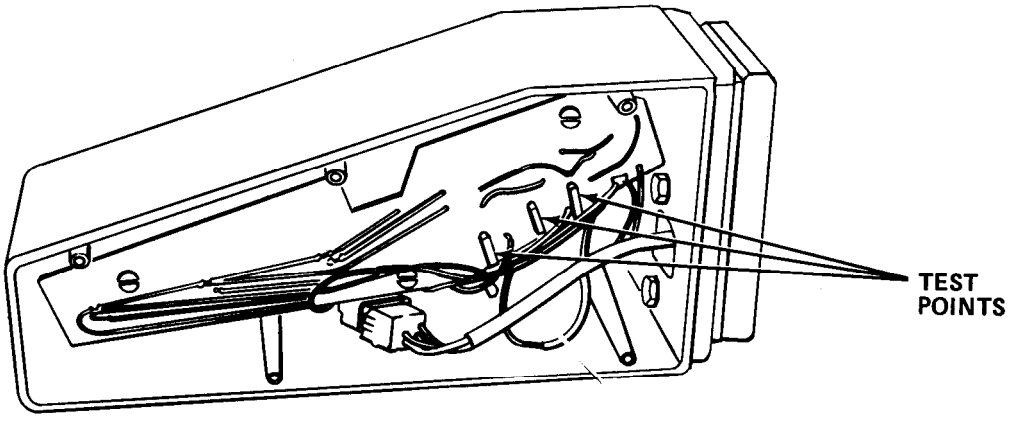
d. Light barrier. Safety system, when activated, directly controls operation of the knife. The light barrier consists of two halves:



(1) Emitter. Contains an array of six lamps and lenses. A lens is mounted in front of each lamp to focus the light transmitted by the lamp. The transmitted light is directed toward collector across cutting area of the table. The lamps are mounted on adjustable spring bases so the intensity and direction of transmitted light can be adjusted. A relay board (LSL) is mounted in the housing to control the operation of the emitter lamps.

(2) Collector. Contains a set of photocells mounted on the photo element board (LSF), and lenses, arranged opposite transmitting lamps. The photocells collect transmitted light, focused by lenses, to create sufficient voltage to cause a transistor stage on light barrier PC card 9 to become conductive towards a O-logic voltage level. The photocells are switched in pairs. A separate signal lamp in the collector indicates when all the photocells are receiving light. If operator reaches across table toward knife, one or more light beams are interrupted, causing the voltage level in the collector cells to raise. This results in a logic-1 voltage (2.5 V dc) in card 9 (test point 9R4), which de-energizes relay d37 powering the signal lamp and causes the hydraulic clutch on the main drive motor to disengage, engaging the spring-activated brake and stopping the knife during downward motion. Before each cut is performed, the condition of light barrier collector automatically is tested to ensure no beams are being interrupted. The photo element board has three test points, G1, G2 and G3, used to check voltage output of photocells. Table 5-1 shows voltage values that should be received if a light beam is interrupted.

Table 5-1. LIGHT BARRIER COLLECTOR SIGNALS AT INTERRUPTION



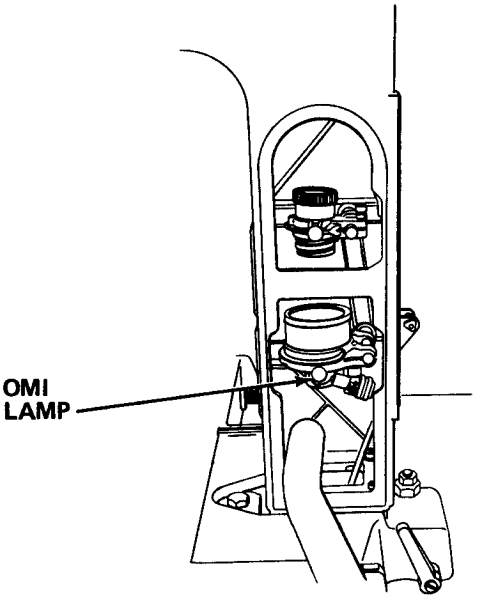
Light Ray Interrupted	Associated Test Point	Expected Signal
1 or 4	G1	0.5 V dc min.
2 or 5	G2	0.5 V dc min.
3 or 6	G3	0.5 V dc min.

Average uninterrupted voltage level should be as close to zero volts as possible with 0.12 volts maximum.

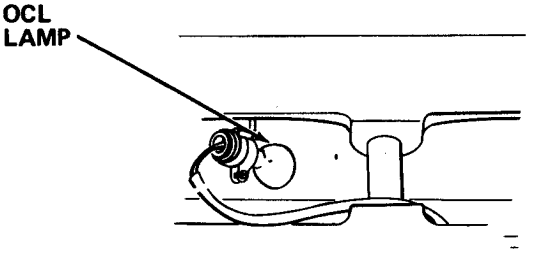
e. Non-repeat circuits. Prevents knife from making more than one cut at a time, or from cutting when light barrier is interrupted during a cut. The non-repeat circuits are controlled by non-repeat relay d230 on standard control PC ST. If relay d230 is not energized, a cut cannot be performed. Relay d230 is de-energized during the upward motion of the knife. This de-energizes relays d230 a/b which will turn off emitter lamps 2, 4, and 6 which will de-energize relay d37. Relay d230 can't be energized again until the cutting buttons are released. Once d230 is re-energize, relay d37 then can be re-energized, if the light barrier is not broken.

f. Safety bolt assembly. Contains a safety bolt controlled by a solenoid. When knife carrier is at top of its stroke, spring tension keeps the safety bolt pressed outward under a plate on the knife carrier, preventing downward motion of the knife. When solenoid is activated, it pulls the bolt back to allow a cut. When the knife reaches the bottom of its stroke, the solenoid de-energizes and the bolt moves against the back of the knife carrier. Once the knife carrier reaches the top, the safety bolt is then free to extend fully and prevent the knife from making a cut. When the bolt is drawn back, it will activate a proximity switch (b.SB). This switch (b.SB) ensures that the bolt is replaced under the carrier after the cut. To re-activate the safety bolt, the cutting buttons must be released and then pressed again.

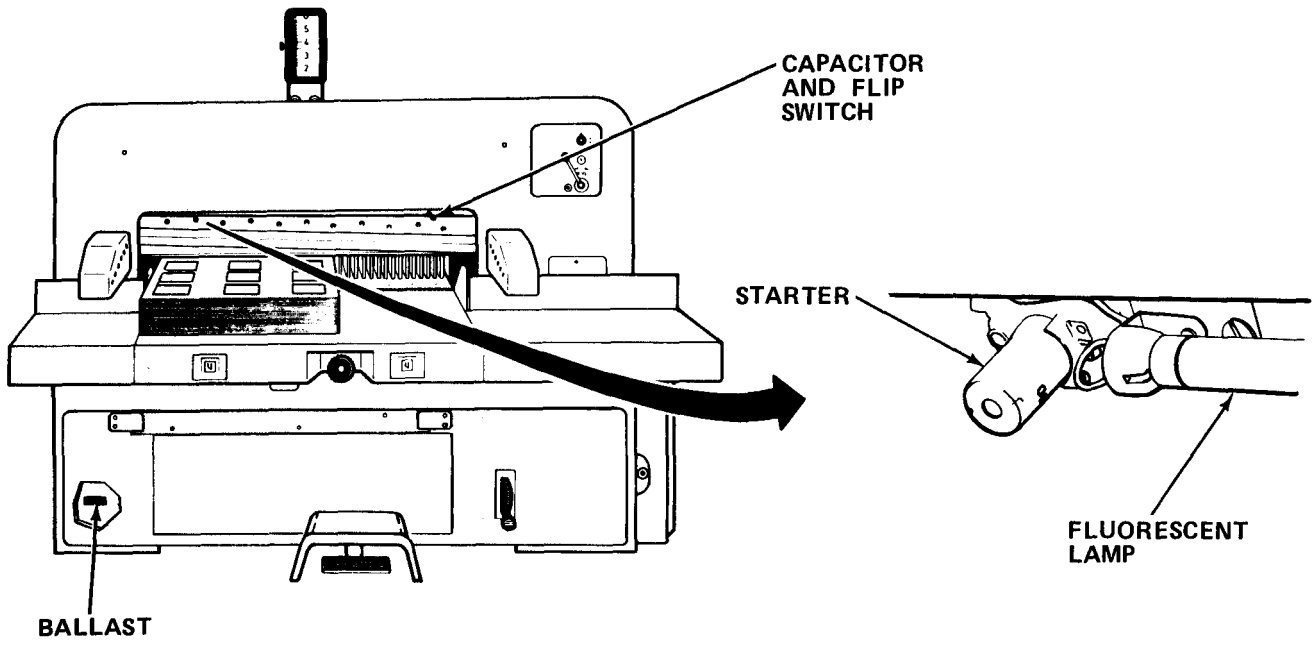
g. Lighting system. Provides illumination of the work surfaces and controls. There are three illumination devices on the machine:



(1) OMI lamp. Provides illumination for OMI. The lamp rests in an adjustable mount beneath a lens and mirror system within the OMI periscope. It provides an even illumination of marks on the glass rule through this focusing system so they can be displayed on OMI screen.

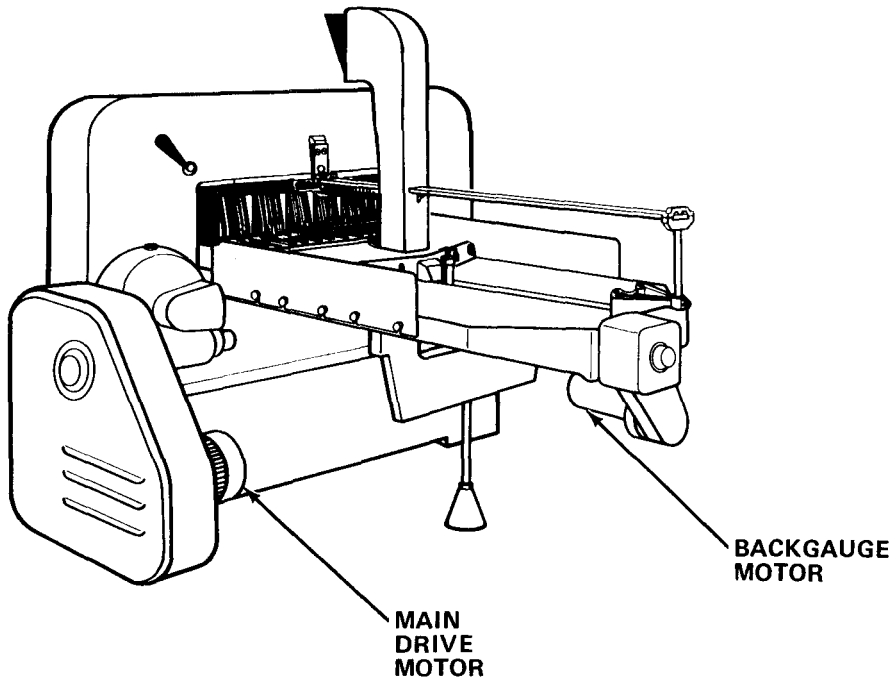


(2) OCL lamps. Two lamps within top frame of machine shine between knife carrier and clamp to produce a thin cutting line on the table bed. The line shows where the knife will cut when it comes down so that material to be cut can be positioned. The position of lamps can be adjusted via two knurled knobs on back of frame to produce the best cutting line.



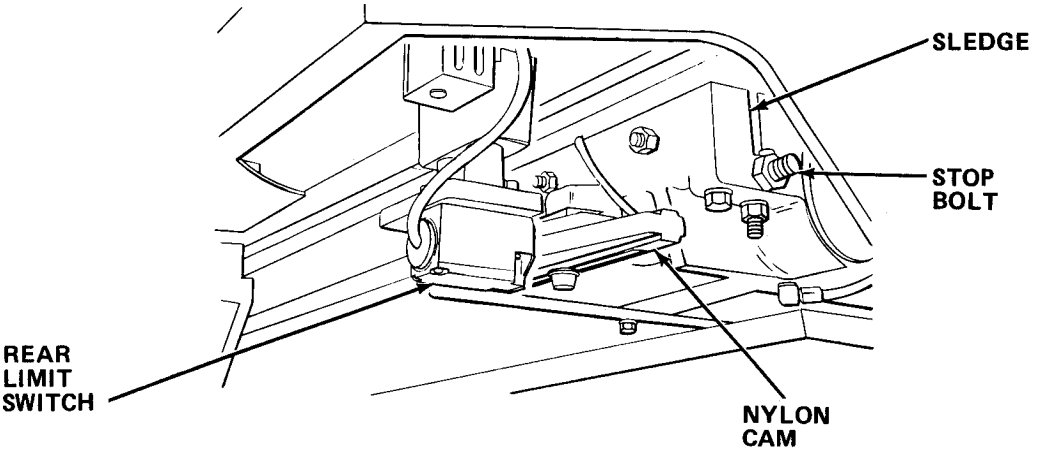
(3) Fluorescent table lamp. Provides general illumination of the table bed work surface. Consists of one fluorescent bulb, a starter, a capacitor, a ballast and a flip switch which turns the lamp on and off. When the fluorescent lamp is on, the OCL lamps are off. When the fluorescent lamp is off, the OCL lamps are on.

h. Motors. Provide driving power for the hydraulic system and backgauge. The machine has two motors:



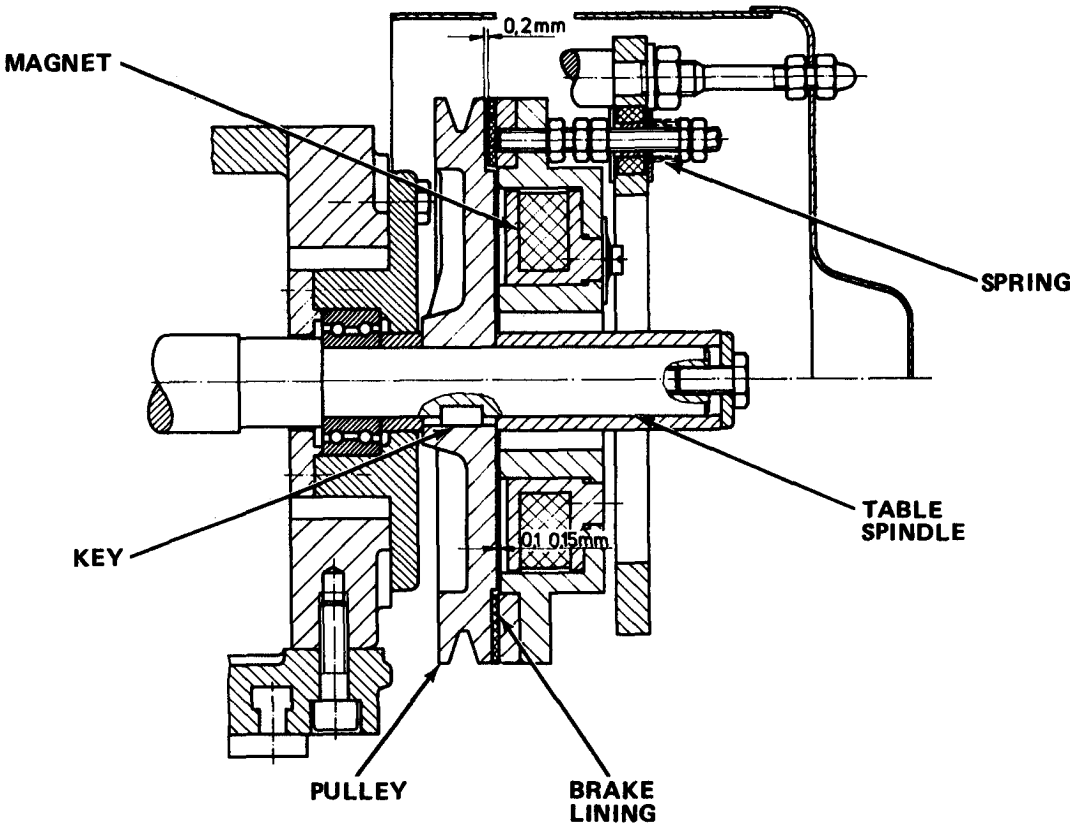
(1) Main drive motor. Provides power to the hydraulic pump, and the hydraulic clutch and gear assembly, via three' pulleys and two V-belts (the clutch and gear assembly drive the knife). It is controlled directly by the main power switch on the control panel. It continues to run as long as the main power switch is in the "I" (on) position. The main motor has a high stalling torque, so that when materials have to be cut, rpm of the motor will drop but the knife will be pulled through the material without fluctuating. An overload relay, located under the cutting table, directly above the right pillar, protects the main drive motor from an overload.

(2) Backgauge motor. Provides power to the backgauge carrier via a pair of pulleys and a V-belt. Operation and the direction of rotation of motor is controlled by a pair of contractors c12 and c15 on standard control PC ST, limit switches mounted along the table bed, and backgauge controls. Power is input from the control transformer. When not in use, the motor is off. When contactor c12 is energized by the backgauge control circuit, the N.O. contacts close and the motor runs forward. If c15 is energized, the motor runs backward. Limit switches mounted along the table bed where the backgauge runs limits the distance the backgauge can travel in either direction. The switches are activated by a pair of nylon trip dog cams that ride on the sledge.



When activated, switches cut power to motor. Switch b13 limits (i.e., is activated by) backward travel. Two switches, b8 and b9, limit forward travel. The first of these switches, b8, can only cut power to motor if false clamp has been removed from its mount, activating limit switch b6 on which it rests. Switch b8 is used to limit backgauge travel shorter than normal to provide the extra space needed to mount the false clamp. The backgauge motor is protected by an overload relay. The relay is located under the backgauge table on the back of the support brace.

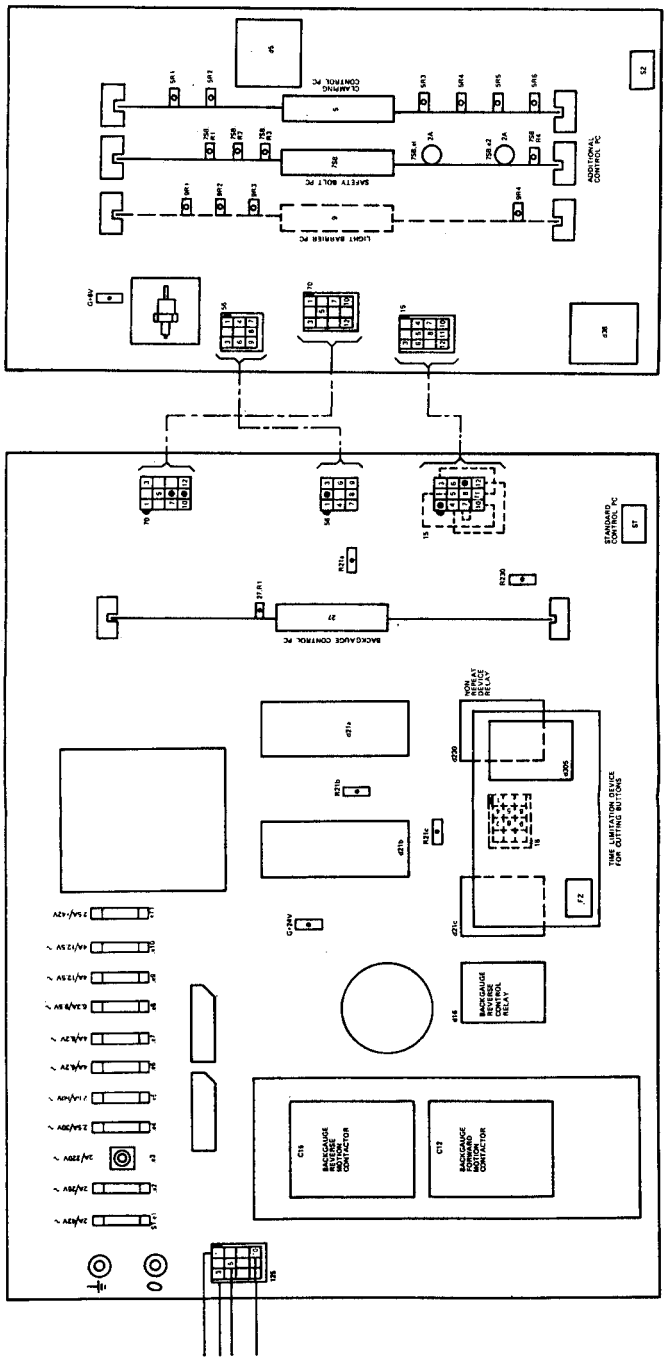
i. Backgauge brake. Provides almost instant stopping (within 1/100th of a second) of the pulley that is driven by the backgauge motor.



The backgauge brake is mounted on the back of the table. The V-belt pulley is connected to the table spindle by means of a key. The magnet with brake linings is elastically fixed to the brake housing. The backgauge brake is controlled by the backgauge control knob. With the paper cutter fully activated, the magnet is energized and pulls the brake linings against the pulley. This immediately stops pulley rotation. The magnet is de-energized whenever the backgauge control knob is used. The springs pull the magnet and brake linings away from the pulley, allowing rotation.

j. Electronics enclosure. Contains all controlling PC cards of the machine except the main distribution card HP.

The PC card enclosure is comprised of:



(1) Motherboards. Main input and output board for signals and power in the system. Consists of two connected PC cards, ST and SZ. All system interconnection and limit switch cables plug into sockets on the rear of the board. Contains secondary bus type fuses for protecting various components of the electronic system (Table 5-2 shows use for each fuse) and contractors and relays that control the backgauge motor and help control the knife cutting.

Table 5-2. MOTHERBOARD (ST and SZ) FUSES

Fuse Designation	Use	*Voltage/Amperage
e1	Backgauge Control Switches/Relays	42 V ac/2 amp
e2	Backgauge Brake Holding Voltage	25 V ac/2 amp
e3	Charging Voltage for Backgauge Brake Capacitor	220 V ac/2 amp
e4	Input to 24 V dc Rectifier	30 V ac/2.5 amp
e5	Input to 42 V dc Rectifier	50 V ac/2.5 amp
e6	Light Barrier Emitter Lamps (h35a)	5.3-5.8 V ac/4 amp
e7	Light Barrier Emitter Lamps (h35b)	5.3-5.8 V ac/4 amp
e8	OMI Bulb	9.5 V ac/6.3 amp
e9	OCL Bulb	12.5 V ac/4 amp
e10	OCL Bulb	12.5 V ac/4 amp
e11	42 V dc Rectified Control Voltage	42 V dc/2.5 amp

*Voltages measured between positive terminal and ground (red,±).

The two parts of the motherboard are identified as the standard control PC card ST and the additional control PC card SZ. The other PC cards are plugged into pins on these two cards. Additional control PC card SZ contains relay d5, for safety bolt solenoid, monitor relay d38, for the light barrier, and components for optional equipment. When optional equipment is not present, the control circuits are not used.

(2) Backgauge brake control PC card 27. Controls the backgauge brake. When contractors controlling power to the backgauge motor and backgauge forward controls are closed, a 50 µF capacitor on PC card 27 is loaded with 220 V ac via a diode. The capacitor supplies its energy to brake solenoid coil m19 via a thyristor stage. The high voltage provides quick engagement of the brake. When the capacitor discharges, the capacitor voltage locks the thyristor stage and the brake is held by just 25 volts via the diodes.

(3) Light barrier PC card 9Provides control, power and testing for the light barrier. When the low voltage from the photocells in the light barrier is received, it causes a transistor stage on the card to become conductive toward a 0-logic voltage level. Relay d37 is energized, which switches on the signal lamp to indicate there is no fault condition. Each time the cutting buttons (b28a and b28b) are activated, signaling a cut, card 9 starts an automatic test of the light barrier. A O-signal is laid across the transistor stages from transistor stage 38. On the light barrier photo element plate, the voltage will rise for a short period to at least 0.5V. Relay d37 de-energizes and the signal lamp is shut off momentarily. If relay d37 will not de-energize during the test, the cut is locked via transistor stage 9 R1 on PC card 9.

(4) Safety bolt control PC card 7SB. Controls operation of the safety bolt.

(5) Conical (clamp) valve control PC card 5. Controls operation of clamping solenoid in hydraulic system control block. Control of unit depends on the operation being performed.

(6) Time limitation device PC card FZ. Contains an RC time constant circuit that prevents cutting operations to be performed unless both cutting buttons are depressed within 0.5 seconds.

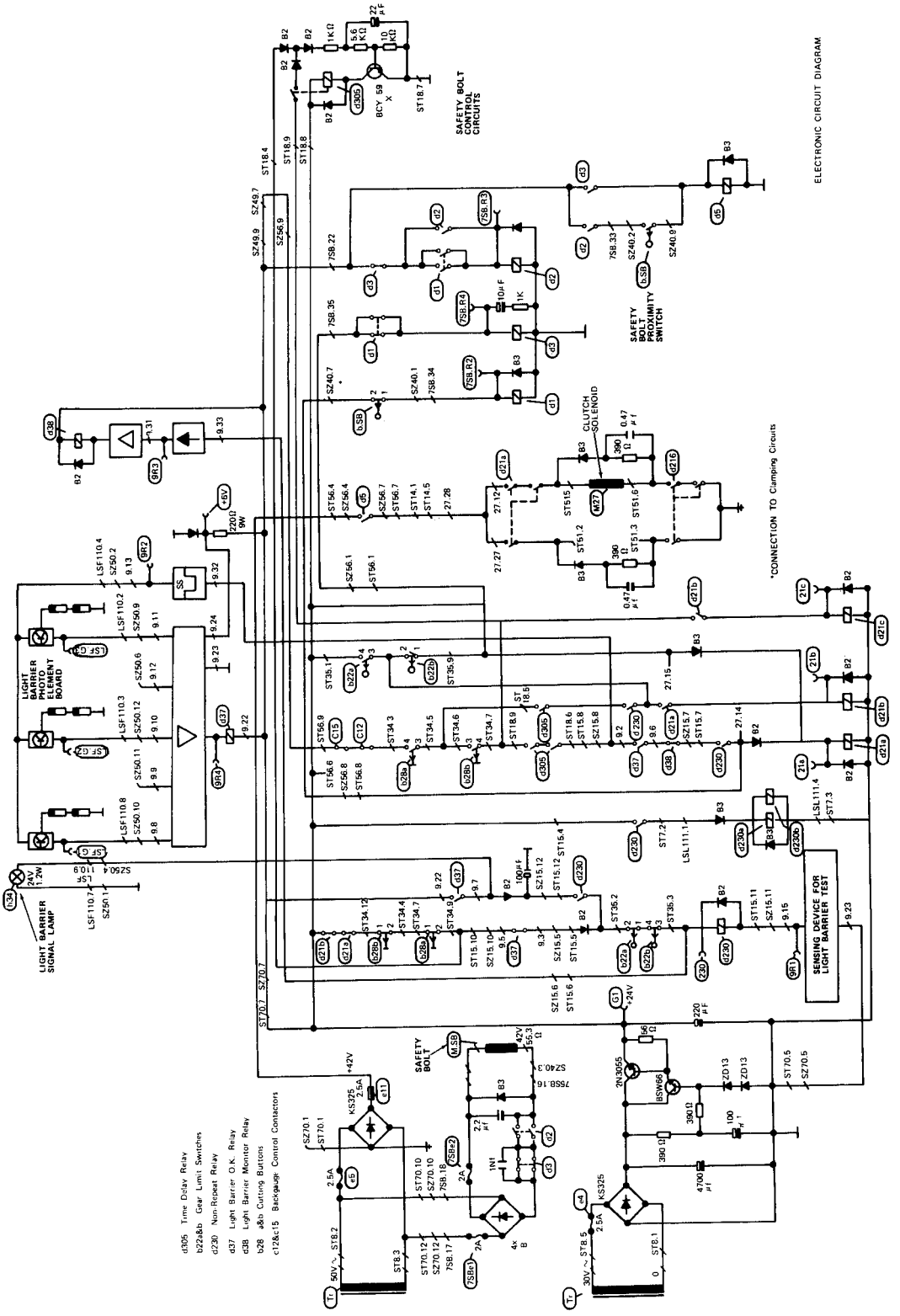
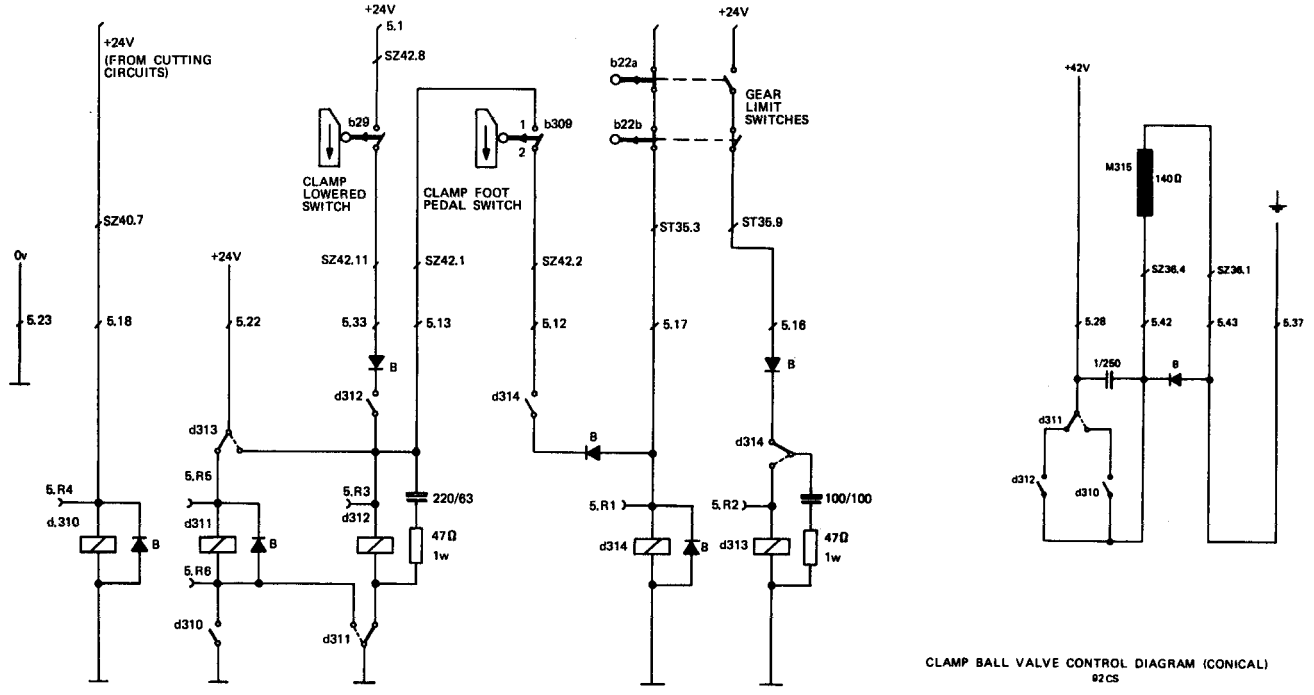


Table 5-3. SYSTEM OPERATION SEQUENCES

NOTE

Refer to applicable circuit schematics to locate circuit components. No backgauge movement. Refer to diagrams on following pages.

Sequence Step	Basic Operation Circuit/Component	Operation



CLAMP BALL VALVE CONTROL DIAGRAM (CONICAL)
92CS

Table 5-3. SYSTEM OPERATION SEQUENCES - Cont

Sequence Step	Basic Operation Circuit/Component Operation
1	Step on foot pedal. +24 V goes through limit switches b22a and b22b N.C. contacts. This energizes relay d314. This allows +24 V to pass through the N.O. contacts of the foot pedal switch b309. This allows relay d312 to energize through N.C. contacts of d311. With d312 energized and d311 de-energized, this allows +42 V to energize m315, the conical valve, and allow hydraulics to lower the clamp.
2	Pressing both cutting buttons. a. Light barrier is tested. This is done by: the N.O. contacts b28a and b28b (cutting buttons) sendinq +24 V through contractors d305 (0.5 sec limitati on relay for cutting buttons). This +24 V is sent to the light barrier circuits. (This will also, through other circuits, cause relay d38 to de-energize.) This will send a pulse through the light emitters. This will de-energize the emitters momentarily. This will momentaril y re-energize relay d37. If d31 does not momentarily de-energize, relay d230 will de-energize (the non-repeat relay). During this test, relay d230 will remain energized because of a 100pF capacitor holding a charge. b. Energizing the safety bolt solenoid. +24 V is applied to relay d1. This allows relay d2 to energize. With relay d2 energized and d3 de-energized, this will allow the safety bolt solenoid M.SB to energize, extracting the safety bolt. This allows relay d5 to energize because of the N.O. contactor of b.SB, now closed.

Table 5-3. SYSTEM OPERATION SEQUENCES - Cont

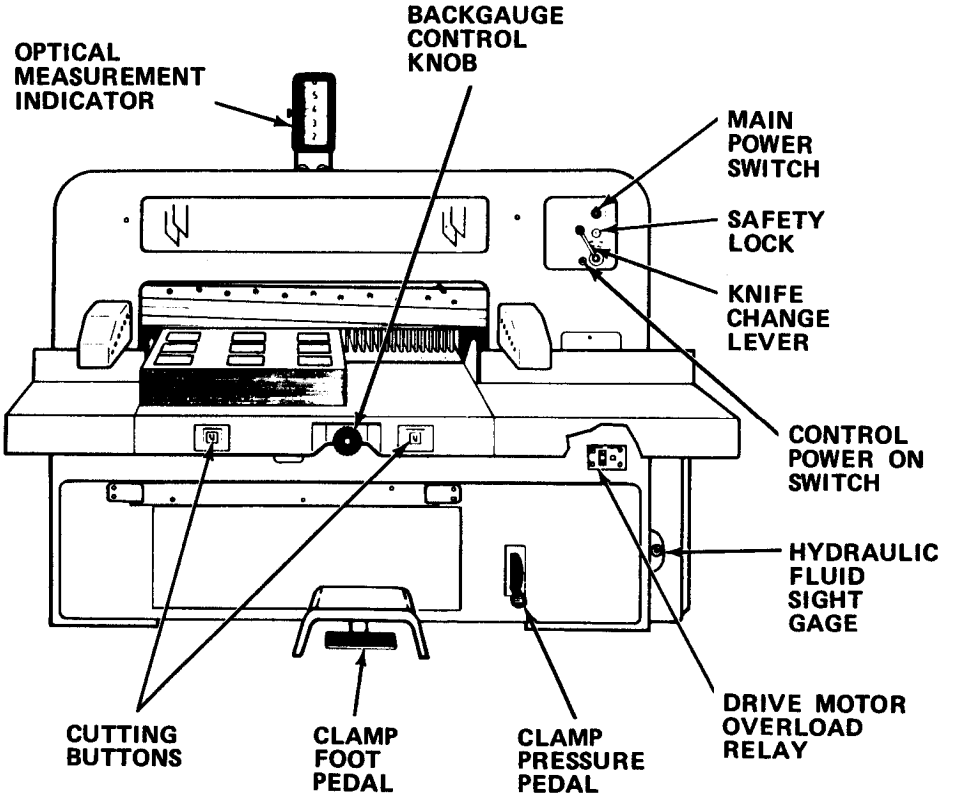
Sequence Step	Basic Operation Circuit/Component Operation
2	Pressing both cutting buttons - Cont
	c. Energizing the clutch ball valve: +24 V applied through the cutting buttons, time limitation relay d305, N.O. contractors of d37 (which will be closed as long as the light barrier is uninterrupted), through N.C. contractors of d38, through N.O. contractors of the non-repeat relay d230, will energize relay d21a. With relay d21a energized, d21b will energize, which will energize d21c. +42 V is applied through d5 contactor which is closed because d5 energized. (d2 energized, and b.SB N.O. contacts closed because the safety bolt is extracted). +42 V is sent through N.O. contacts of d21a to m27 (clutch ball valve) and allows m27 to energize because of the N.O. contractors d21b also being closed.
	d. Clamping pressure. With both cutting buttons depressed, relay d310 is energized. Relay d311 becomes energized because of relay d313 N.O. contractors, and the now closed contractors of d310. This allows +42 V to be applied to m315 (the conical valve). Because the ball valve, m27 is energized this allows the hydraulics to build up full pressure. Once pressure in the hydraulics has reached enough pressure to move the slide valve, the clutch will receive its pressure. This allows the clamp to build up pressure before the knife descends.
3.	Knife at bottom of its stroke.
	a. Light barrier de-energized: With N.C. contractors of gear limit switches b22a and b22b opened, this de-energizes relay d230, the non-repeat relay. This will de-energize relays d230a and d230b, this in turn will de-energize half of the light barrier lights, which will de-energize relay d37.
	b. Safety bolt solenoid de-energized: With N.O. contractors of gear limit switches b22a and b22b closed, this allows relay d3 to energize. With d3 energized, the N.C. contractors are opened and voltage is lost to the safety bolt solenoid and it is released. The bolt is then pressed on the back of the knife carrier.

Table 5-3. SYSTEM OPERATION SEQUENCES - Cont

Sequence Step	Basic Operation Circuit/Component Operation
3	Knife at bottom of its stroke - Cont
	c. Locking of clamp pressure: With the light barrier de-energized, N.O. contractors of d37 open, the 24 V is lost to relay d310, this will open the contractors d311 and d310 for the conical valve m315. N.O. contractors of d314 will be open because of the gear limit switches b22a and b now open. This will de-energize relay d312 and its N.O. contractors will open. During this time, +24 V is being sent to the RC network of relay d313 to charge the capacitor.
4	Knife reaches top of its stroke.
	a. De-energize the clutch ball valve: N.O. contractors b22a and b22b of the gear limit switches are again open. This removes +24 V from relays d21a, d21b and d21c, and relay d3. This will remove +42 V from clutch ball valve solenoid m27.
	b. Releasing Clamp: N.C. contractors of gear limit switches b22a and b are now closed again. This allows relay d314 to energize again. Relay d313 will energize for 0.5 seconds because of the stored charge on the capacitor. This will allow relay d312 to energize, and it will remain energized because of its own contactor and the fact that the clamp is down, also allowing the N.O. contactor b29 to be closed. With d311 de-energized, and d312 energized, +42 V is again applied to solenoid m315.
5	Releasing the cutting buttons.
	a. Reset relay d230 and d230 a and b: With the cutting buttons released, N.C. contractors b28a and b28b are closed. This will allow +24 V through the contractors d37, b22a and b22b. This will energize d230. With relay d230 energized, relays d230a and b are allowed to energize. This turns the emitter lamps in the light barrier on again and allows relay d37 to re-energize. Relay d38 is also re-energized.

Section II OPERATING INSTRUCTIONS

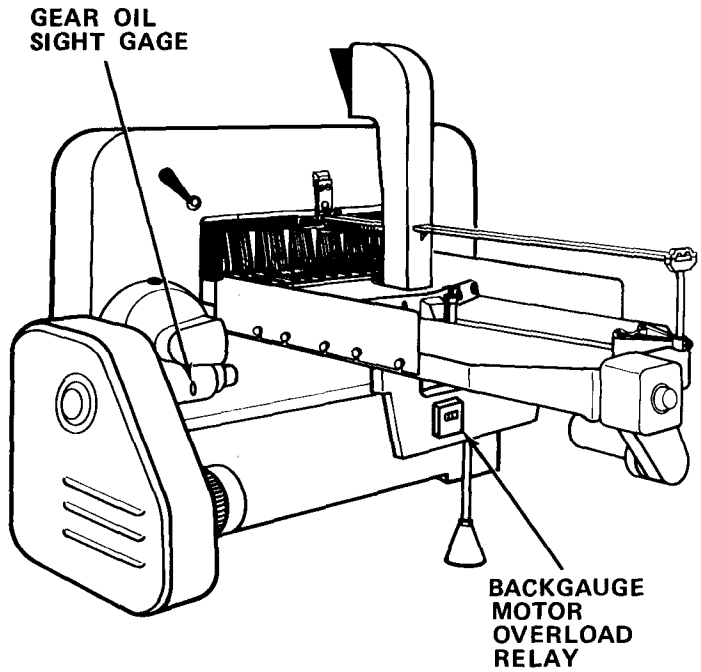
5-4. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.



Control or Indicator	Function
Optical Measurement Indicator (Scale)	Indicates distance from backgauge to knife.
Backgauge Control Knob	Controls movement of backgauge: FORWARD: Pull knob out. BACKWARD: Push button in. HAND FINE ADJUSTMENT: Push knob in and rotate.

Control or Indicator	Function
Main Power Switch	Controls main power supply to cutter. ON: Rotate right to I. OFF: Rotate left to 0.
Safety Lock	Prevents unauthorized use of paper cutter.
Knife Change Lever	Allows knife carrier to be jogged to any position during knife change procedures.
Control Power On Switch	Activates main power supply to activate electronic controls.
Drive Motor Overload Relay	Protects drive motor from circuit overloads. **To reset, press (green -) switch.**
Clamp Pressure Control	Controls force applied by clamp.
Clamp Foot Pedal	Controls low pressure operation of clamp.
Cutting Buttons	By simultaneously pressing both buttons within 0.5 seconds, the knife cutting circuits are activated.
Hydraulic Fluid Sight Gage	Used to check hydraulic fluid level.

Control or Indicator	Function



Backgauge Motor Overload Relay	Protects backgauge motor from circuit overloads. To reset, press I switch.
Gear Oil Sight Gage	Used to check level of gear oil in main drive gear assembly.

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 the 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 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. 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	Leakaqe 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.

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

Item	Quantity
Flat Tip Screwdriver	1 ea
Key Set, Socket Head Screw 2mm-19mm	1 ea
Cheesecloth (Item 6, Appendix E)	ar
Lens Tissue (Item 13, Appendix E)	ar
Solvent, P-D-680 (Item 26, Appendix E)	ar
Wax (Item 30, Appendix E)	ar
Paper	ar
Lens Cleaner (Item 5, Appendix E)	ar
Vacuum Cleaner	1 ea
Impermeable Gloves	1 pr
Faceshield, Industrial	1 ea

Table 5-4. 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.	INTER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER	
1	B	**Inspect Paper Cutter.**	
		1. Inspect knife for knicked, blunt or damaged cutting edge.	Knife is damaged.
		2. Check for loose nuts, bolts, and screws on knife assembly. Tighten if loose.	
		3. Check glass rule for loose mountings. Tighten if loose. Clean scale with lens tissue and cleaner.	

Table 5-4. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

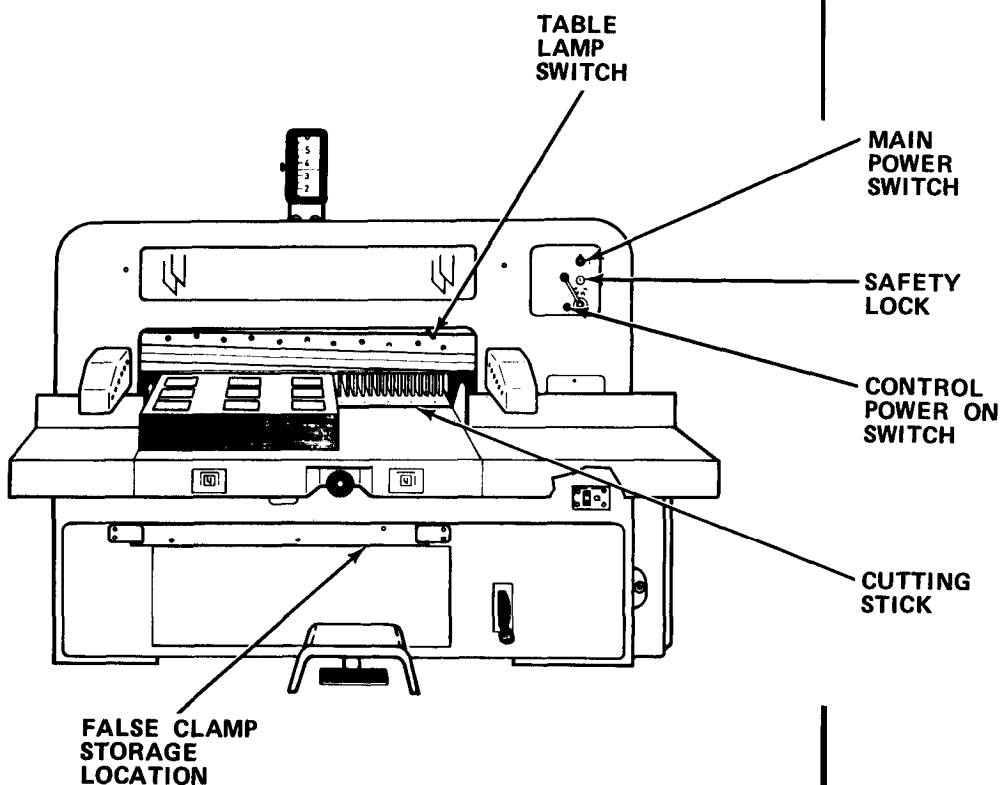
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
1	B	Inspect Paper Cutter - Cont	
			
		4. Turn on power and check OCL lamps. (a) Unlock safety lock with operator key. (b) Turn main power switch to I position. (c) Press control power on switch. (d) Place table lamp switch to the left and check optical cutting line for correct operation.	OCL does not illuminate.

Table 54. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

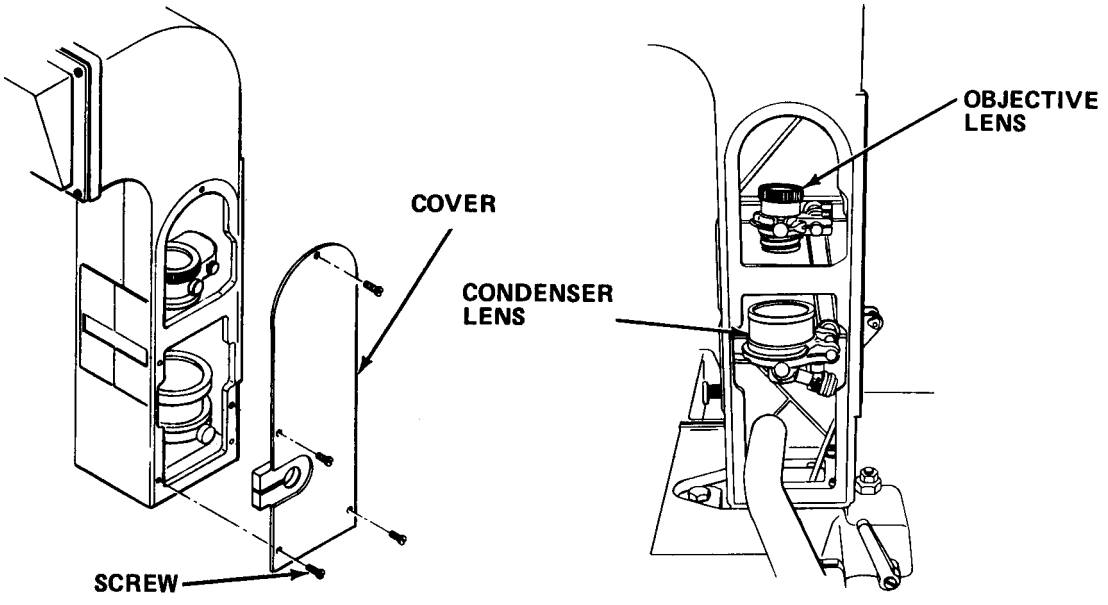
B - Before, D - During, A - After | W - Weekly, M - Monthly, Q - Quarterly | AN - Annually, S - Semiannually, BI - Biennially | (Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
1	B	Inspect Paper Cutter - Cont	
		5. Place table illumination switch to the right and check light for correct operation.	Light operates incorrectly.
		6. Check cutting stick for damage or excessively deep grooves. Rotate or replace if worn or damaged.	
		7. Check false clamp for proper insertion in either its holder under front of table or installed in clamp.	False clamp is not properly inserted.
		8. Turn off paper cutter. (a) Turn main power switch to O position. (b) Lock safety lock with operator key.	
2	B	Clean Paper Cutter. **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. Flashpoint of solvent is 100° to 138°F (38° to 59°C) . 1. Clean work surface with solvent-soaked cheesecloth and coat with wax.	

Table 5-4. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cent	
2	B	Clean Paper Cutter - Cent	
		2. Clean glass scale with lens tissue and cleaner.	



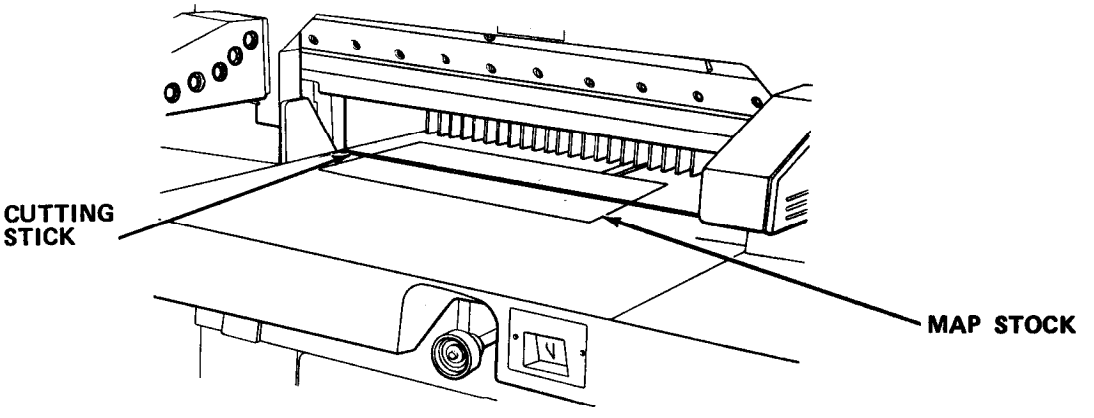
3. Clean OMI lenses with lens tissue and cleaner.

4. Clean light barrier emitter and collector lenses with lens tissue and cleaner.

Table 5-4. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
3	B	Check Knife Cut and Cutting Stick.	



1. Lay one sheet of map stock across cutting line.
2. Turn on power.
   (a) Unlock safety lock with operator key.
   (b) Turn main power switch to I position.
   (c) Press control power on switch.

WARNING

Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.

3. Press both cutting buttons and perform a cut.

Table 5-4. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cent

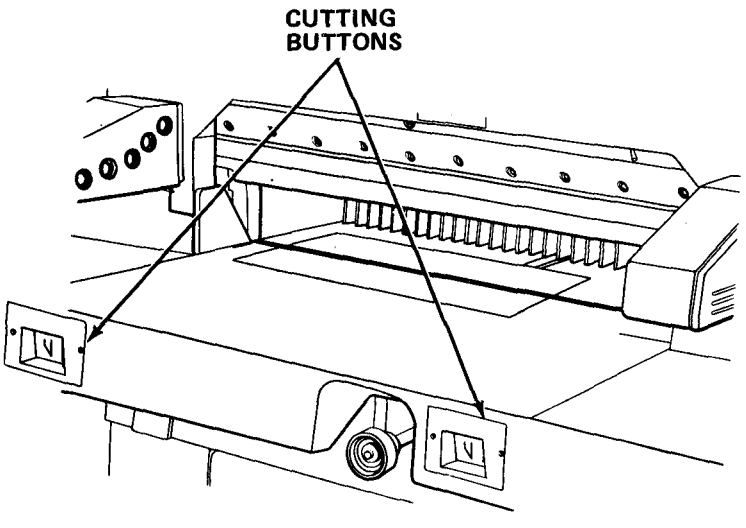
B - Before
D - During
A - After

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:
		PAPER CUTTER - Cont	
3	B	Check Knife Cut and Cutting Stick - Cont	
		4. Check sheet for complete, even cut. If sheet is not cut completely through, check cutting stick, and rotate if necessary.	
		5. Make another cut and if sheet is still not cut completely through, adjust the knife.	
		6. Lay several new sheets of paper across cutting line and perform another cut.	Sheets are not cut completely through.
		7. Turn off power.	
		(a) Turn main power switch to O position.	
		(b) Lock the safety lock with the operator key.	
4	B	Inspect Cutting Buttons.	



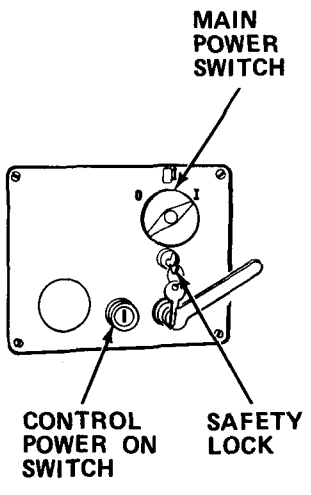


Table 5-4. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
4	B	Inspect Cutting Buttons - Cont	
		1. Turn on power.	
		(a) Unlock the safety lock with operator key.	
		(b) Turn main power switch to I position.	
		(c) Press control power on switch.	
		WARNING Be sure personnel and foreign materials are clear of cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.	
		2. Press cutting buttons separately, then together.	One cutting button activates cut.
		NOTE Only one cut should be performed if buttons are pressed continually.	
		3. Press both cutting buttons and hold.	Multiple cuts are performed without releasing cutting buttons.
		NOTE Knife must stop at upper deadpoint and cutting buttons must be released before another cut can be performed.	

Table 5-4. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

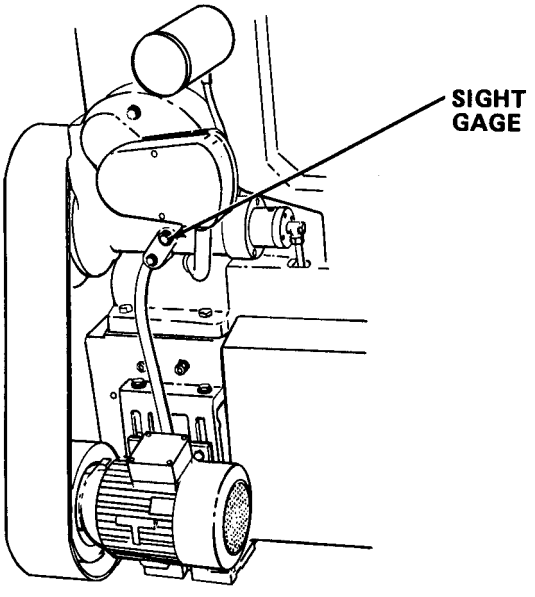
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
4	B	Inspect Cutting Buttons - Cont	
		4. Release both cutting buttons and press again.	Knife does not stop at upper deadpoint.
		5. Turn off power. (a) Turn main power switch to O position. (b) Lock the safety lock with the operator key.	
5	B	Check Drive Gear Oil Level.	
			
		Check fluid sight gage on rear of drive gear housing. Fluid should be visible in gage.	Gear oil not visible in sight gage.

Table 5-4. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
Bl-Biennially

(Number) - Hundreds of Hours

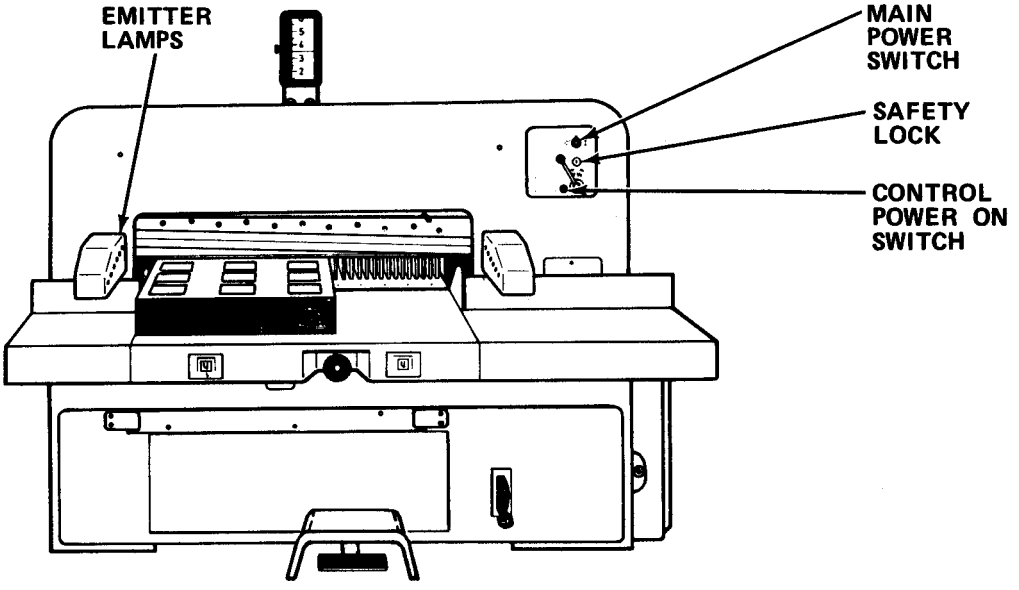
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
6	B	Check Light Barrier.	
			
		1. Turn on power. (a) Unlock safety lock with operator key. (b) Turn main power switch to I position. (c) Press control power on switch.	
		2. Check that signal lamp on right light barrier housing is on.	
		3. Cover each emitter lamp individually and make sure signal lamp goes off.	Signal lamp does not go off.

Table 5-4. 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

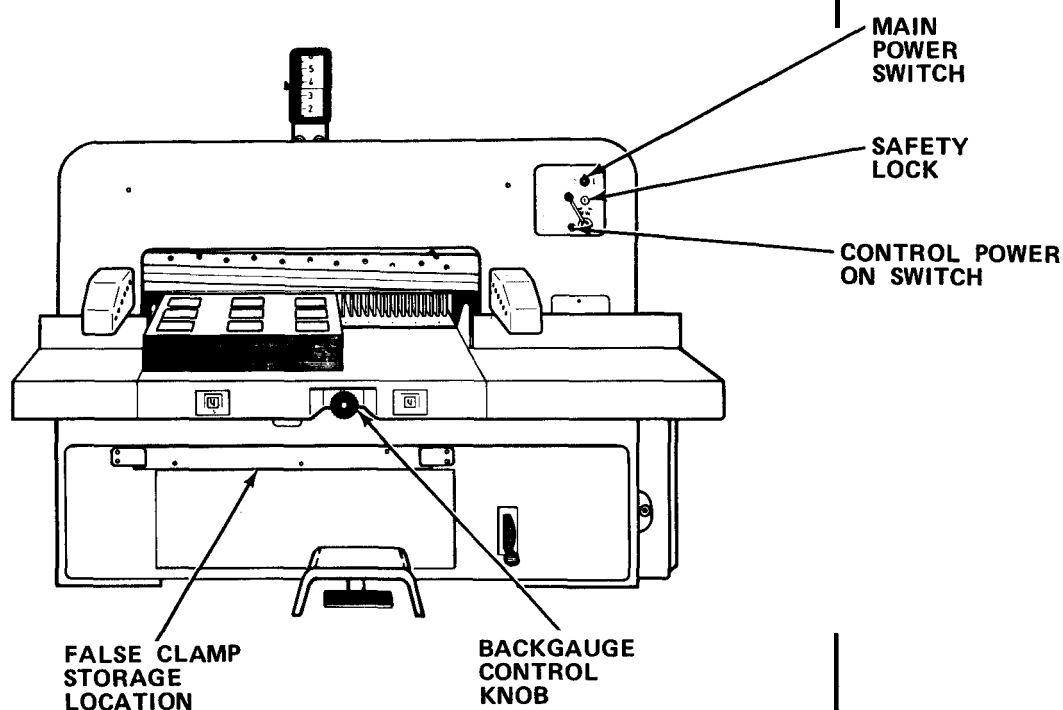
(Number) - Hundreds of Hours

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE	For Reediness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
6	B	Check Light Barrier - Cont	
		WARNING **Be sure personnel and foreign materials are clear of cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.**	
		5. Perform cut and interrupt light barrier. Knife must stop immediately on downward stroke when light barrier is broken.	Knife does not stop immediately.
		6. Turn off power.	
		(a) Turn main power switch to O position.	
		(b) Lock safety lock with operator key.	

Table 5-4. 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 Bl - Biennially

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
7	B	Inspect Backgauge.	



1. Turn on power.

   (a) Unlock safety lock with operator key.

   (b) Turn main power switch on.

   (c) Press control power on switch.

2. Press button in center of backgauge control knob. Backgauge should move rearward and stop automatically when travel limit is reached. — Backgauge does not stop .

3. Remove false clamp from its holder under table and install on clamp.

Table 5-4. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
Bl - Biennially

(Number) - Hundreds of Hours

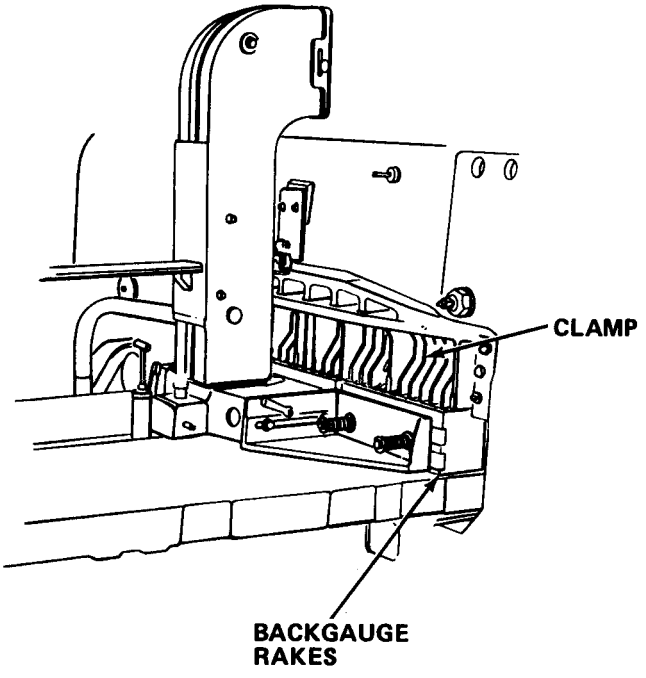
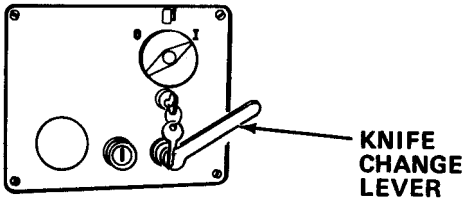
ITEM NO	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
7	B	Inspect Backgauge - Cont	
			
		4. Pull backgauge control knob outward. Backgauge should move forward, stopping automatically just short of clamp.	Backgauge contacts clamp.
		5. Press clamp foot pedal down and lower clamp approximately halfway down.	
			

Table 5-4. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
Bl - Biennially

(Number) - Hundreds of Hours

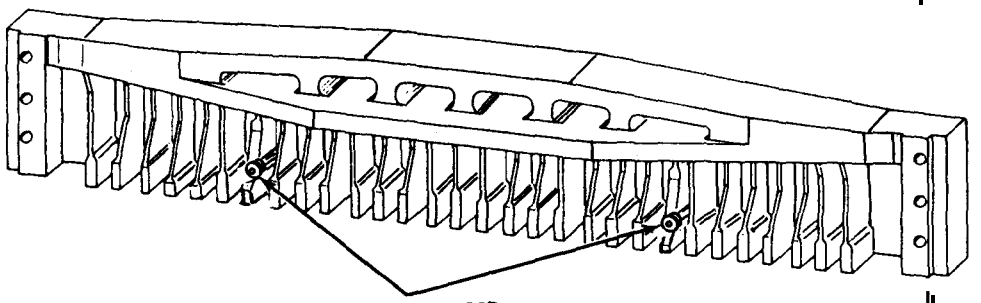
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
7	B	Inspect Backgauge - Cont	
		6. Turn the knife change lever to the right, locking the clamp in the down position.	
		 FALSE CLAMP RELEASE PINS	
		7. Pull out on false clamp release pins, and lock them off.	
		8. Turn the knife change lever to the left, raising the clamp.	
		9. Remove false clamp and insert it into its holder under the table.	
		10. Pull backgauge control knob outward. Backgauge should move forward under clamp and stop short of knife.	Backgauge does not move under clamp.
		11. Press button in center of backgauge control knob. Move backgauge back approximately halfway.	
		12. Press backgauge control knob inward until manual drive gears engage.	

Table 5-4. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

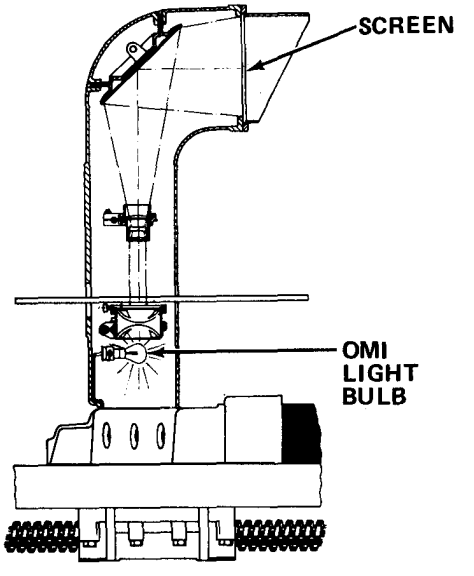
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
7	B	Inspect Backgauge - Cont	
		13. Rotate backgauge control knob and backgauge should move easily, indicating brake has disengaged.	Backgauge does not move easily.
		14. Turn off power.	
		(a) Turn main power switch to 0 position.	
		(b) Lock safety lock with operator key.	
8	B	Inspect OMI.	
			
		1. Inspect OMI for any structural damage. Check that light bulb is operating.	Light bulb does not operate.

Table 5-4. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

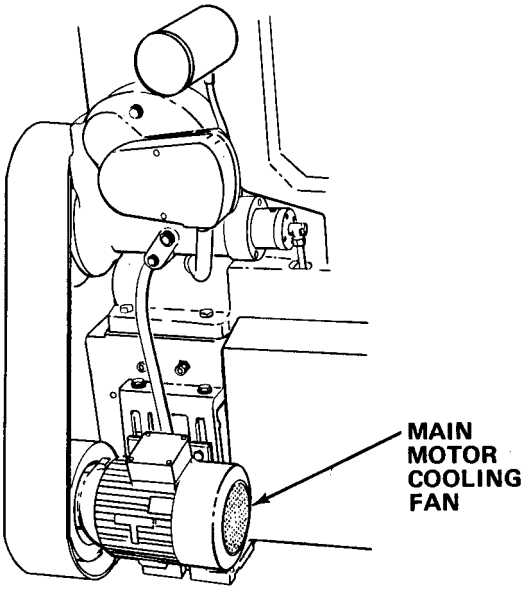
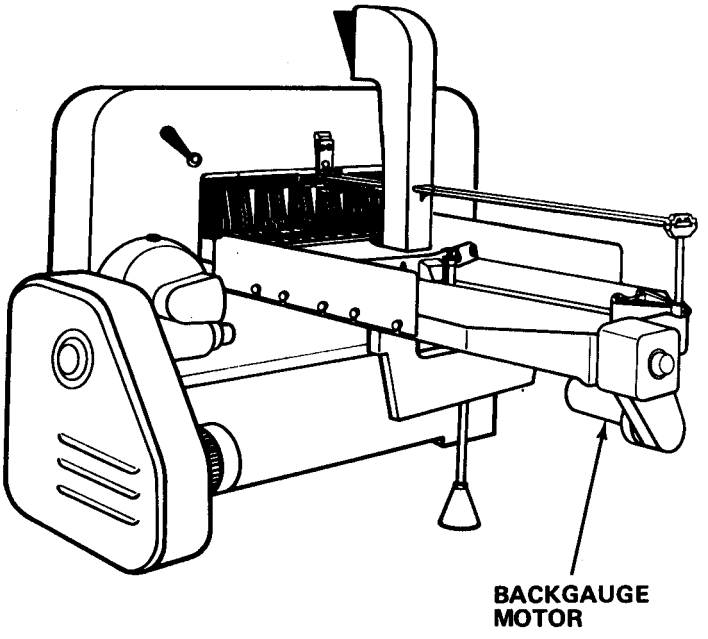
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
8	B	Inspect OMI - Cont	
		2. Check screen for cracks, dirt, or discoloration.	
		3. Check for cleanliness. Check that all surfaces are free from dirt, oil, or grease. Clean if necessary.	
9	W	Inspect Main Motor Cooling Fan.	
			
		1. Inspect for buildup of dirt and foreign particles on fan and suction screen of motor.	
		2. Clean by using a vacuum cleaner.	

Table 54. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

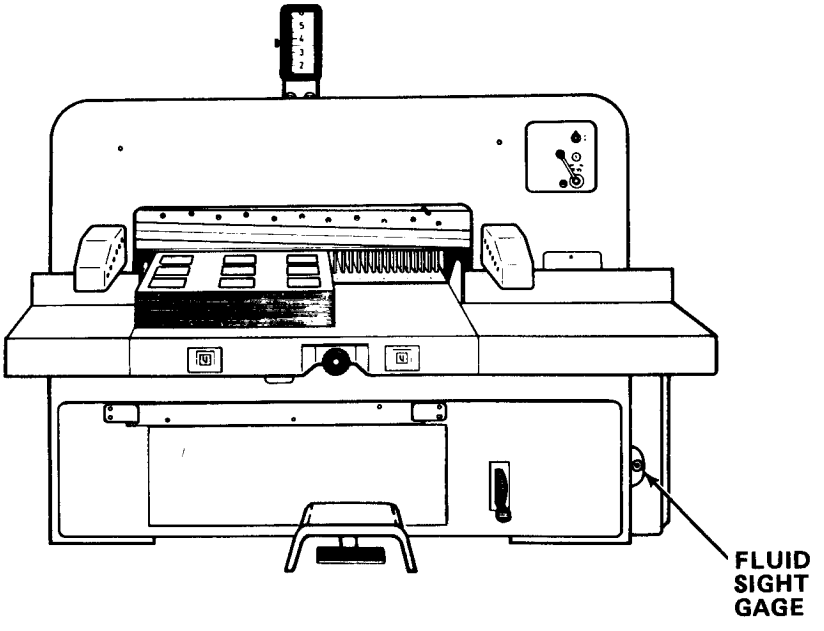
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
10	W	Inspect Backgauge Motor Cooling Fan.	



1. Inspect for buildup of dirt and foreign particles on fan and suction screen of motor.
2. Clean by using a vacuum cleaner.

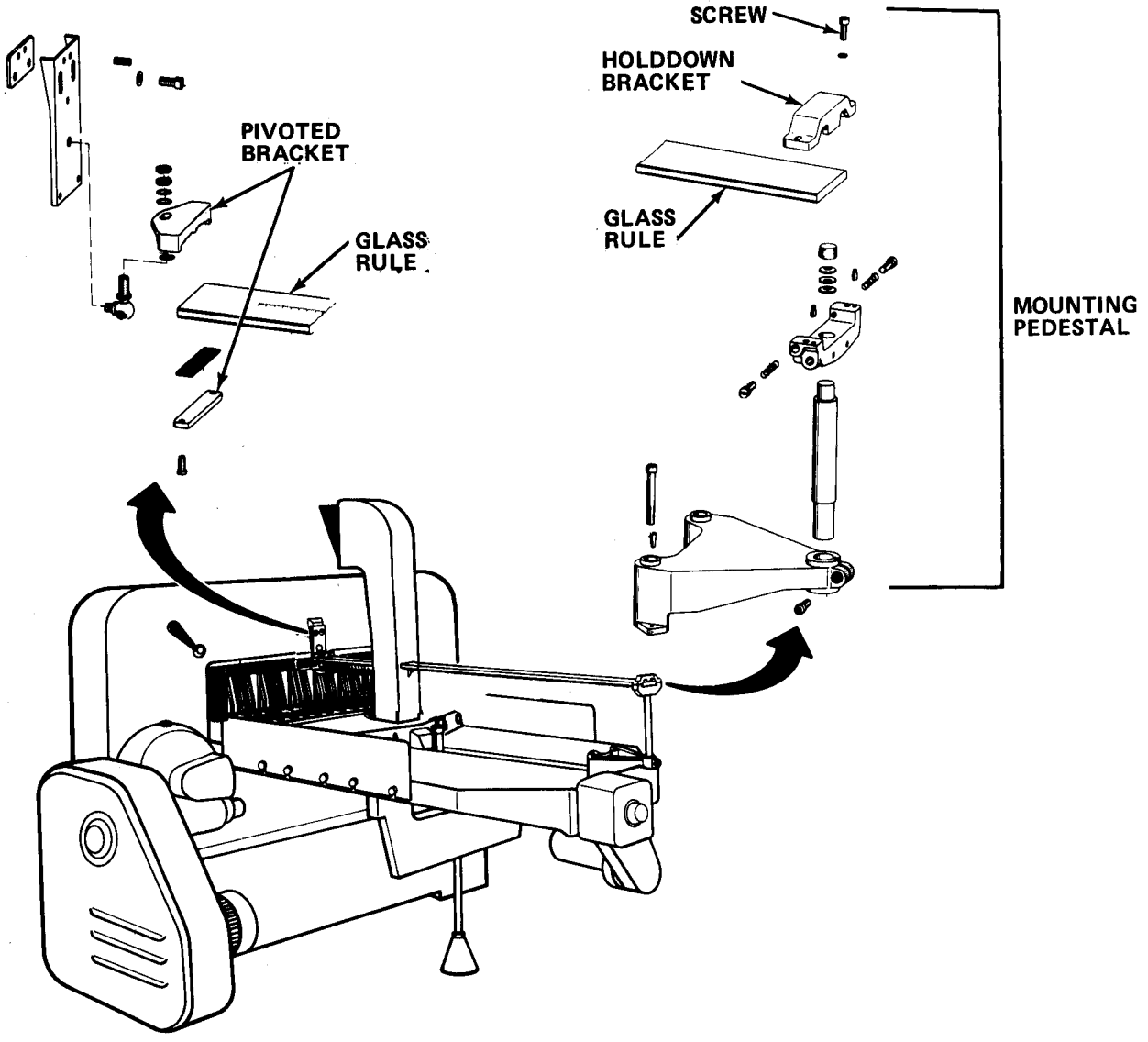
Table 5-4. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
11	B	Check Hydraulic Fluid Level and For Leaks in System.	
			
		1. Check fluid sight gage on right pillar. Fluid should be visible in gage.	Hydraulic fluid not visible in sight gage.
		2. Check hydraulic components external to right pillar for leakage.	If class III leaks are present.

5-6. OPERATION UNDER USUAL CONDITIONS.

5-6.1 Assembly and Preparation for Use.



a. Remove glass rule from storage box and carefully insert smaller numbered end into rear of periscope (numbers must be facing down).

b. Insert forward end ("O" end) of glass rule in pivoted bracket and set rear of rule in mounting pedestal.

C. Turn on power.

(1) Unlock safety lock with operator key.

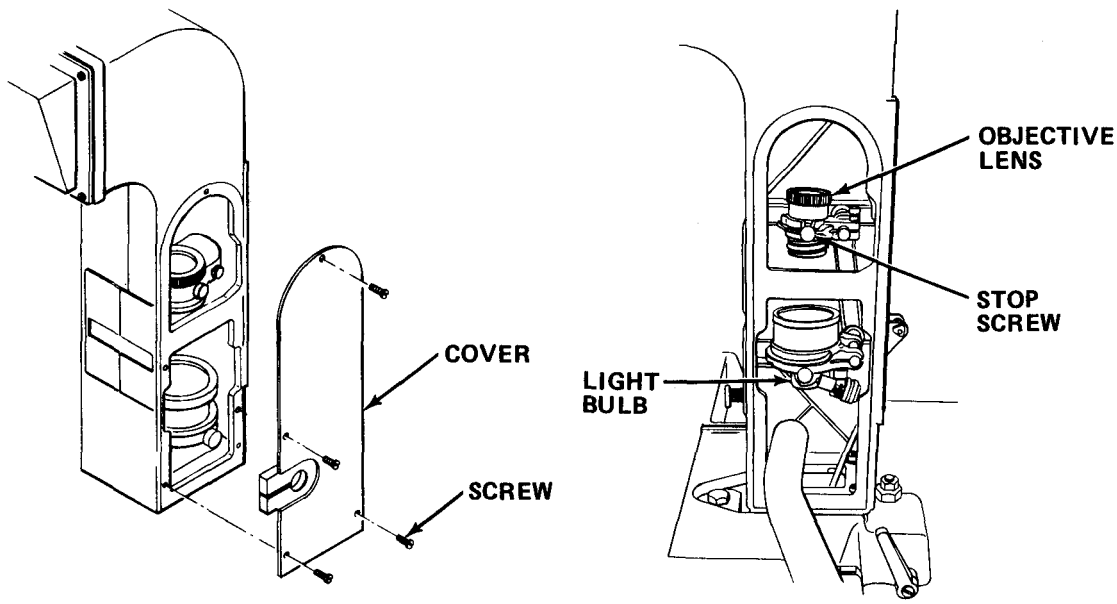
(2) Turn main power switch on.

(3) Press control power on switch.

d. Check to be sure numbers are not upside down.

e. Install holddown bracket and retain with screws.

f. Adjust OMI as follows:



(1) Check to be sure screen is fully illuminated. If not, adjust the position of the light bulb.

(2) Check image focus on OMI. If image is out of focus, objective lens must be adjusted as follows:

(a) Remove four screws which secure cover to OMI housing and remove cover.

(b) Loosen stop screw on objective holder and focus image by moving objective lens up or down.

(c) Tighten stop screw.

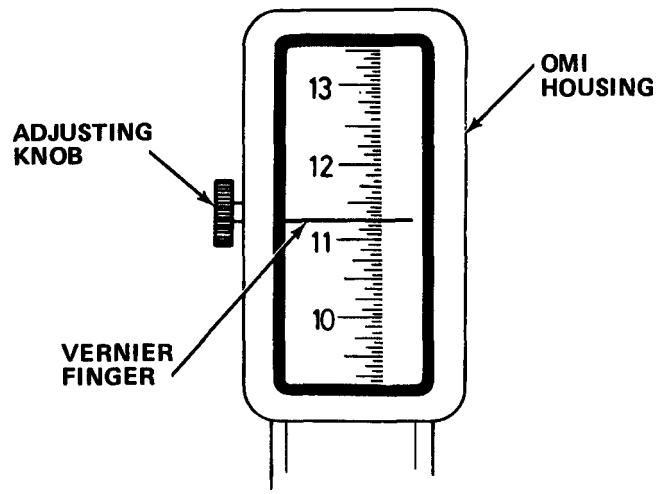
(d) Install cover and secure with four screws.

(3) Move knife change lever to knife change position.

(4) Jog knife blade to low deadpoint position by intermittently depressing and releasing cut buttons.

(5) Place 12 in. rule on table behind knife. Position rule so that it is perpendicular to and touching knife at approximate midway point of length of knife.

(6) Carefully move backgauge forward until it touches opposite end of rule. This ensures backgauge is precisely 12 in. from knife.



(7) Adjust vernier finger, by means of knob located on left side of OMI housing, until vernier finger lies directly on 12 in. mark. If the finger will not reach, loosen the glass and adjust its position to the finger.

(8) Move backgauge backward slightly and remove rule.

(9) Depress and hold cut buttons until knife blade returns to its top position.

(10) Move knife change lever to normal position.

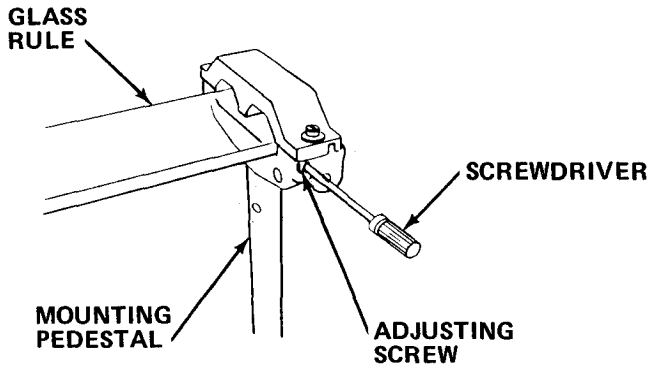
g. Adjust glass rule as follows:

(1) Move backgauge to its most forward position.

(2) Using pencil, place a vertical mark on OMI screen at edge of a graduation mark projected on screen.

(3) Move backgauge to its most rearward position.

(4) If pencil mark is no longer at same position in relation to the edge of the projected graduation marks, adjust glass rule.



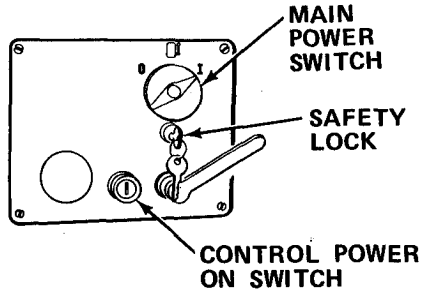
(5) Using adjusting screws located on either side of mounting pedestal, move glass rule from side to side until pencil mark on OMI screen coincides with edge of projected graduations.

(6) Turn off power.

(a) Turn main power switch to 0 position.

(b) Lock safety lock with operator key.

5-6.2 Operating Procedures.



a. Turn on circuit breaker.

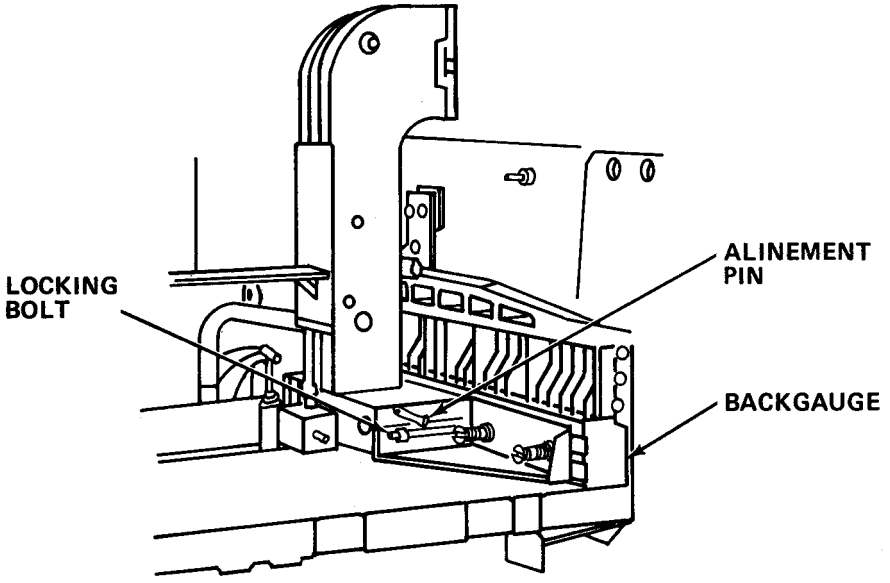
b. Unlock safety lock using operator key.

c. Rotate main power switch to on (I) position.

d. Press control power on switch.

e. Move backgauge to desired cut length.

f. If multiple cuts are to be made at different lengths, set the backgauge side rakes as follows:



(1) Remove alinement pin from side rake being adjusted.

(2) Loosen locking bolts on side of rake.

NOTE

It may be necessary to remove the locking bolts and place them in another hole to obtain proper setting.

(3) Set rake to desired position.

(4) Tighten locking bolts.

g. Place paper against backgauge.

NOTE

- Be sure paper is fitted tightly against the backgauge rakes and the side of the table.
- Make like paper cuts from same side of knife assembly.

h. Refer to table 5-5 for information on setting clamp pressure and the use of the false clamp.

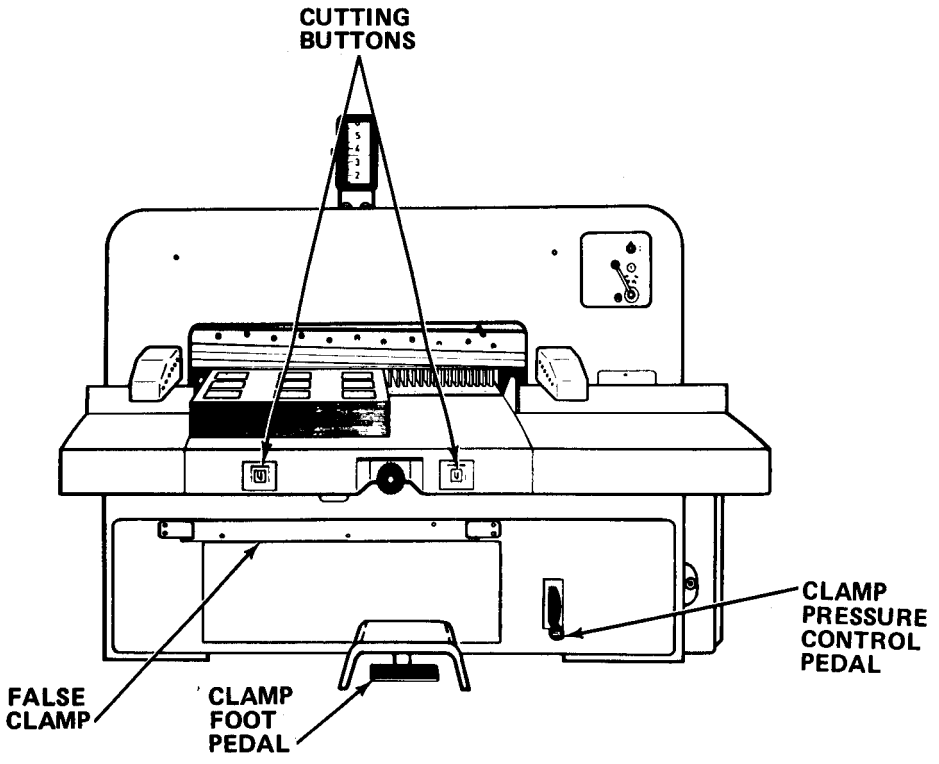
NOTE

All values indicated in the table are based on manufacturer's experience. The values for the clamp pressure refer to a pile of paper of medium height and more than two thirds of the total cutting width of the cutter. Higher and wider piles of paper need a higher pressure. Lower and narrower piles of paper need less pressure. Delicate materials (thin, soft) need the false clamp.

Table 5-5. RECOMMENDED CLAMP PRESSURES

Material	Pressure in Kg	Remarks
Bible Paper	1000 - 1500	False clamp
Felt Paper	1500 - 2000	False clamp
Printing Paper (normal)	2000	
Writing Papers	2000 - 2500	
Felt Board	1500 - 2000	
Grey Board	2500	False clamp
Post Card Board	2500	

i. Insert false clamp if necessary.



j. Set clamp pressure.

WARNING

- Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.
- Always keep the largest area of the material beinq cut behind the knife. If the larger area is in front of the knife, it could fly up and serious injury may occur.

k. Press clamp foot pedal and clamp paper.

1. Press both cutting buttons (simultaneously) and perform cut.

m. After the knife has returned to its upper position, release the cutting buttons.

n. Release clamp foot pedal.

o. Remove cut paper.

p. Check that cut is clean with no burned, over or under cuts, or draw.

q. To perform additional cuts, repeat steps e through p.

r. If the backgauge rakes were set at different lengths, reset them as follows:

(1) Loosen the locking bolts.

NOTE

It may be necessary to remove the locking bolts and place them in another hole to obtain proper alinement.

(2) Reposition the side rakes so that all rakes are al ined.

(3) Insert the alinement pin in through the side rakes. Tap pin into place to be sure side rake is properly positioned.

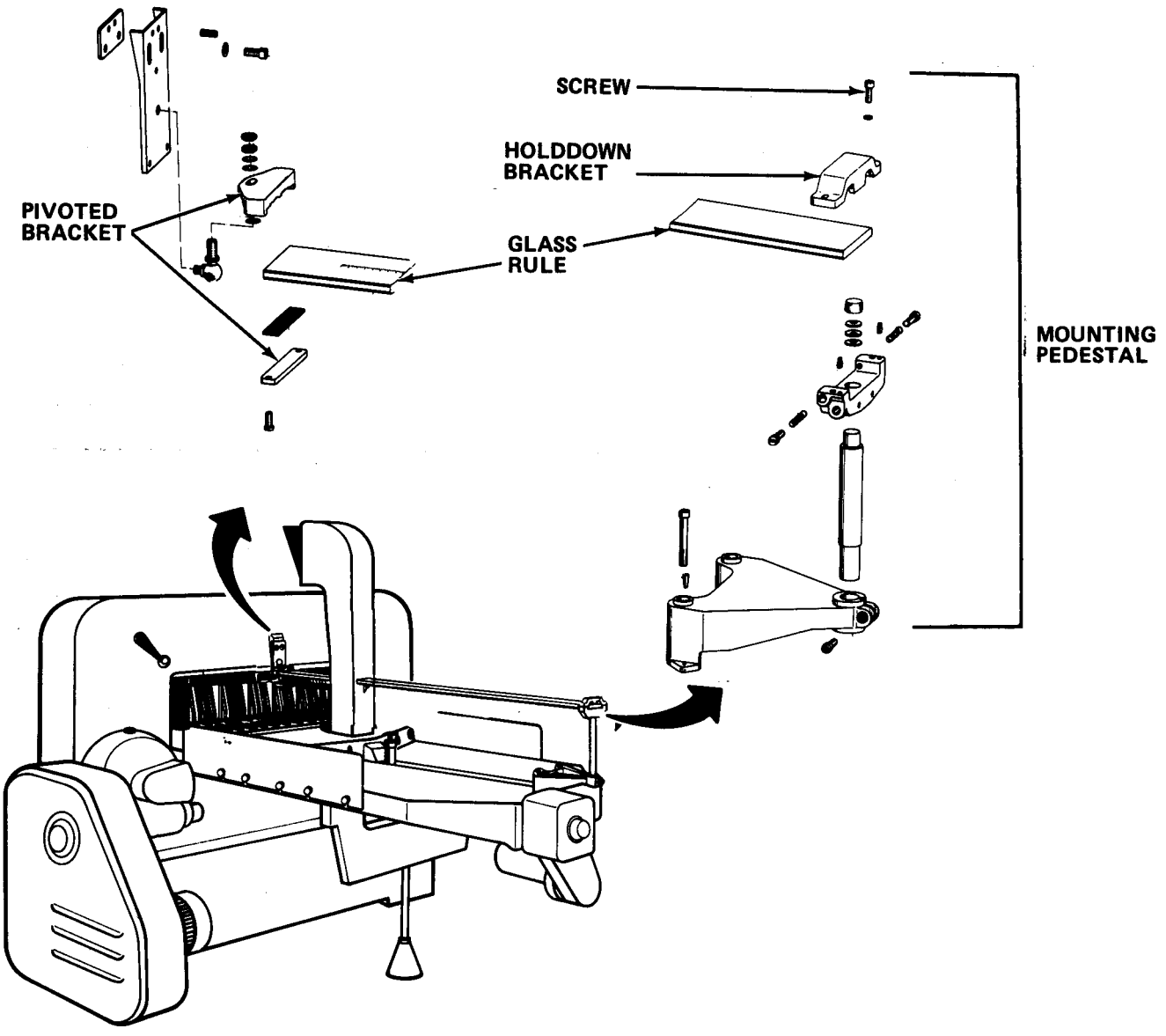
(4) Tighten locking bolts.

s. Turn main power switch to O position.

t. Using operator key, lock the safety lock.

u. Turn off circuit breaker.

5-6.3 Preparation for Movement.



a. Remove glass rule assembly as follows:

(1) Remove screws and holddown bracket.

(2) Remove glass rule from pivoted bracket and carefully remove glass rule from periscope.

(3) Place glass rule into storage box.

b. Install false clamp onto clamp.

5-7. OPERATION UNDER UNUSUAL CONDITIONS.

This equipment is designed for operation only in a controlled environment.

Section III OPERATOR MAINTENANCE

5-8. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication at the operator level of maintenance.

5-9. TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during operation or maintenance of the paper cutter, 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.

SYMPTOM INDEX

SYMPTOM INDEX - Cont

Table 5-6. TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

1. MACHINE DOES NOT CUT THROUGH MATERIAL.

Step 1. Check thickness of material.

(a) If material is too thick, reduce height of material to be cut .

(b) If not, proceed to step 2.

Step 2. Check to make sure material being cut is not too hard.

(a) If material is too hard, do not attempt to cut material. Equipment damage may occur.

(b) If malfunction persists, refer to organizational maintenance.

2. BOTTOM SHEET OF MATERIAL IS CUT ONLY ON ONE SIDE OR NOT AT ALL.

Check cutting stick for deep cuts.

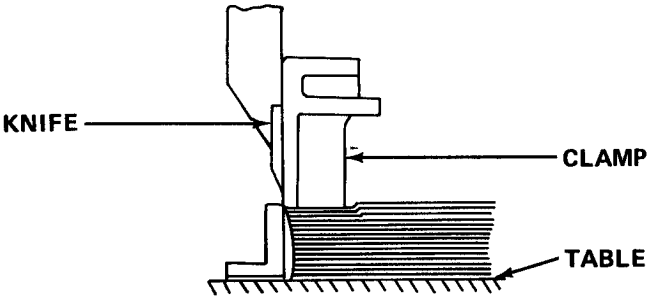
(a) If cutting stick has deep cuts, rotate or replace cutting stick (paragraph 5-10.3).

(b) If malfunction persists, refer to organizational maintenance.

Table 5-6. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

3. OVERCUT DURING THE CUT. THE KNIFE MOVES FORWARD IN THE MATERIAL SO THAT THE LOWER SHEETS OF THE MATERIAL ARE LONGER.



Step 1. Check that material is properly jogged.

(a) If not, jog material.

(b) If jogged properly, proceed to step 2.

Step 2. Check setting of clamp pressure control pedal.

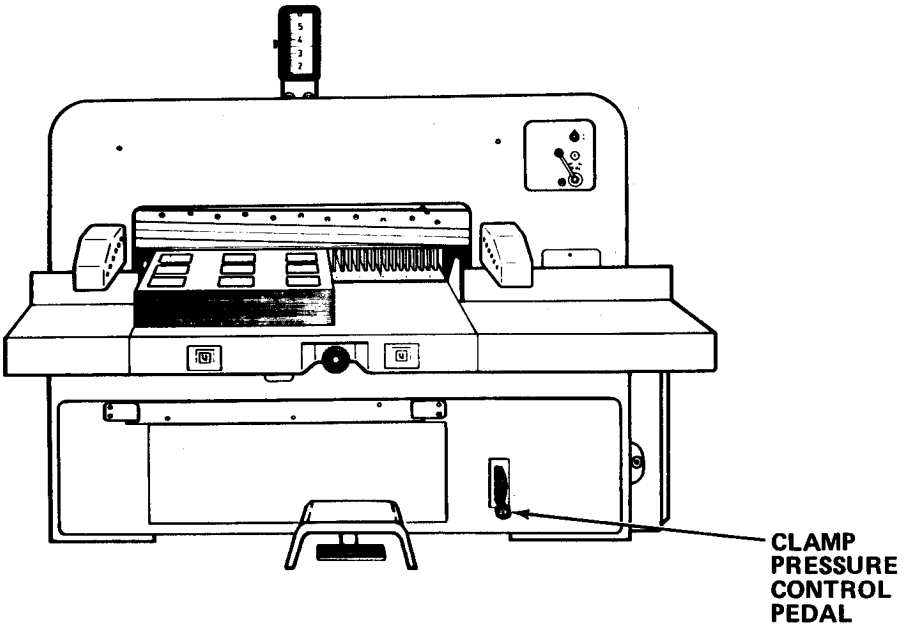


Table 5-6. TROUBLESHOOTING - Cont

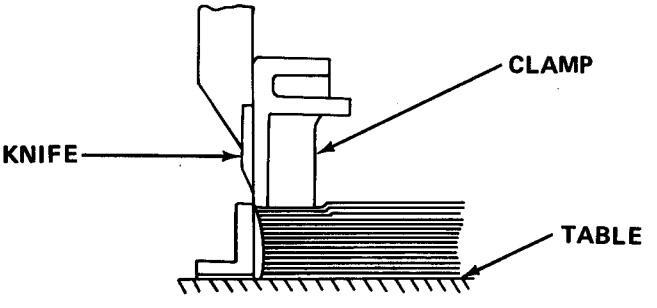
MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
3. OVERCUT DURING THE CUT. THE KNIFE MOVES FORWARD IN THE MATERIAL SO THAT THE LOWER SHEETS OF THE MATERIAL ARE LONGER - Cent	(a) If it is below 1500, then increase clamp pressure by moving clamp pressure control pedal down one or two notches. Check again for overcut. **NOTE** Different materials require different clamp pressures. Refer to Table 5-5 for proper pressures. (b) Repeat step 2 until clamp pressure control pedal has been fully depressed. (c) If malfunction persists, refer to organizational maintenance.
4. UNDERCUT DURING THE CUT. THE KNIFE MOVES BACK INTO THE MATERIAL SO THAT THE TOP SHEETS OF THE MATERIAL ARE LONGER.  Step 1. Check that material is properly jogged.	(a) If not, jog material. (b) If jogged properly, proceed to step 2.

Table 5-6. TROUBLESHOOTING - Cont

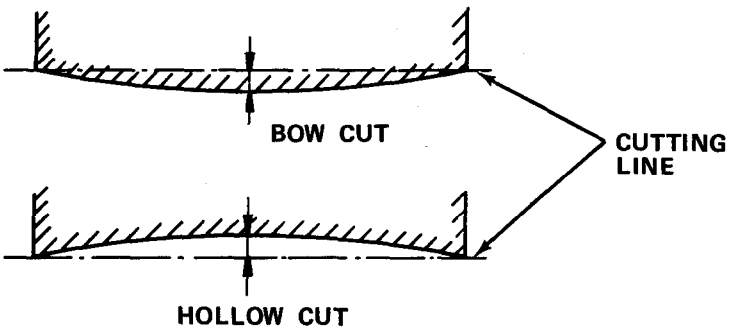
MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
4. UNDERCUT DURING THE CUT. THE KNIFE MOVES BACK INTO THE MATERIAL SO THAT THE TOP SHEETS OF THE MATERIAL ARE LONGER - Cont
Step 2. Check that material is not too soft for proper knife cut.
(a) Immaterial is too soft, increase clamp pressure.
(b) If malfunction persists, refer to organizational maintenance.
5. BOW OR HOLLOW CUT OBTAINED.

Step 1. Check that material is properly jogged.
(a) If not, jog material.
(b) If jogged properly, proceed to step 2.
Step 2. Check that material is even in height.
(a) If not, make material even in height.
(b) If material is even in height, proceed to step 3.
Step 3. Check that material is not wavy or warped.
(a) Reduce the clamping pressure as far as possible and start trimming the material from the center.
(b) If malfunction persists, refer to organizational maintenance for replacement of the knife (paragraph 5-16.13).

Table 5-6. TROUBLESHOOTING - Cont

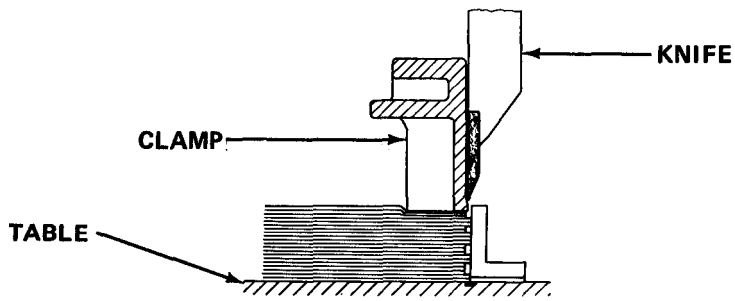
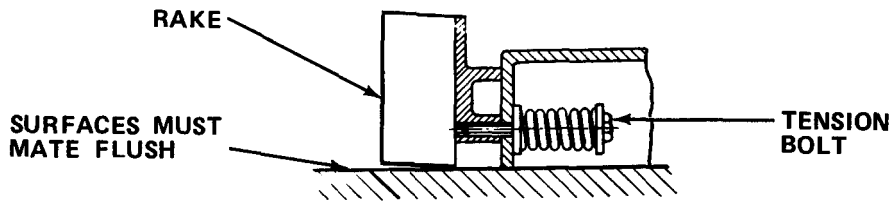
MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
6. STEPPED CUTS ARE OBTAINED.	
	
Step 1. Check that material is properly jogged.	
	(a) If not, jog material.
	(b) If jogged properly, proceed to step 2.
Step 2. Check clamp pressure.	
	(a) If clamp pressure is low, increase clamp pressure by depressing clamp pressure control pedal.
	(b) If malfunction persists, refer to organizational maintenance.
7. NOTCHED CUTTING LINE OBTAINED.	
Check for foreign object in cutting material, or nicks in knife.	
	(a) If foreign object is in cutting material, remove it.
	(b) If knife has nicks, refer to organizational maintenance for replacement of knife (paragraph 5-16.13).

Table 56. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

8. BOTTOM SHEET SLIDES UNDER BACKGAUGE RAKES.

Check to be sure there is no gap between bottom front of backgauge rake and table surface. (Surfaces must mate flush).



Set correct backgauge rake spring tension, by screwing tension bolt in as far as it will go (until coils of spring touch each other), then loosen it 1/2 turn.

9. THE KNIFE IS PULLING SHEETS OUT FROM UNDER THE CLAMP DURING A CUT.

Step 1. Check to see if the cutting material is too soft and spongy.

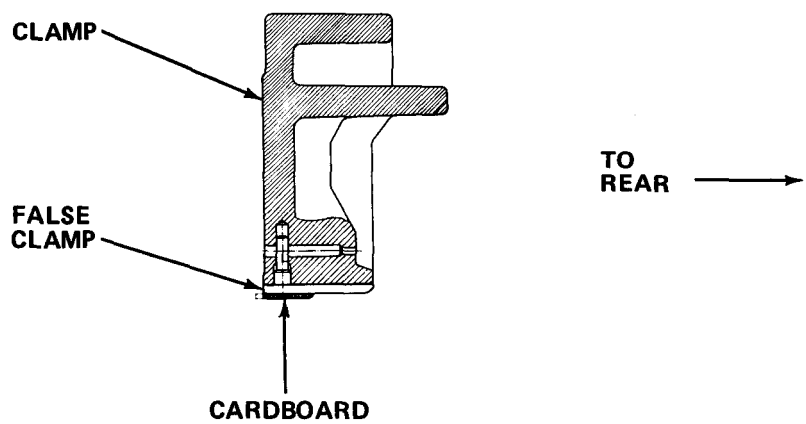


Table 5-6. TROUBLESHOOTING - Cont

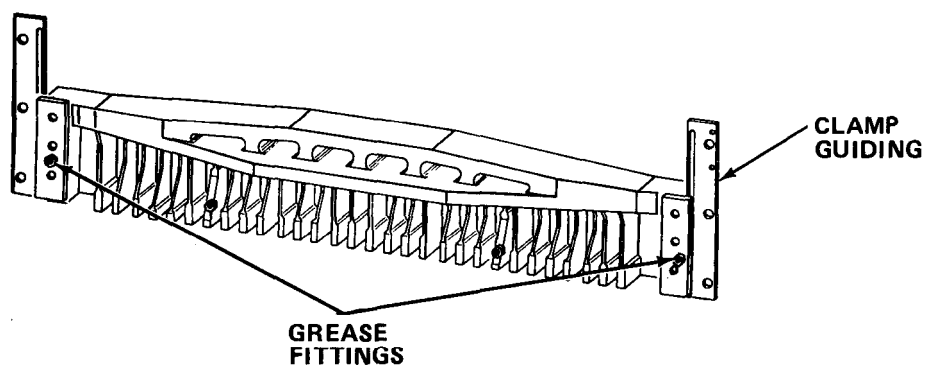
MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
9. THE KNIFE IS PULLING SHEETS OUT FROM UNDER THE CLAMP DURING A CUT - Cont
(a) If material is too soft or spongy, insert the false clamp and perform the following: Glue a 4-5mm thick cardboard strip under the front third of the false clamp. Slant the strip toward the rear so that all the pressure is actually at the very area where the cut takes place. The cardboard should protrude a little from the false clamp and will be cut off-at the first cut cycle.
(b) If malfunction persists, refer to direct/general support maintenance.
10. CLAMP DOES NOT DESCEND COMPLETELY WHEN USING THE FOOT PEDAL.
Step 1. Check for dirty or improperly lubricated clamp guidings.
(a) If dirty or improperly lubricated, clean and lubricate clamp guidings (paragraph 5-11.).

(b) If malfunction persists, refer to organizational maintenance.

Table 5-6. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
11. FLUORESCENT TABLE LAMP WILL NOT COME ON. Turn lamp switch to right and then back to left. Check to see if light comes on. (a) If light does not come on, replace fluorescent lamp (paragraph 5-10.4). (b) If light does not come on, replace starter (paragraph 5-10.4). (c) If malfunction persists, refer to organizational maintenance.
12. OPTICAL CUTTING LINE ABSENT. Press control power on switch. Turn lamp switch to right. Turn off overhead lights above table. Check to see if line appears. (a) If lights do not come on, replace OCL bulbs (paragraph 5-10.5). (b) If malfunction persists, refer to organizational maintenance.
13. OCL TOO WIDE OR FUZZY. Step 1. Lift top cover and check to see if both OCL bulbs are lit. (a) If bulbs are not 1 it, replace burned out bulb (paragraph 5-10.5). (b) If lit, proceed to step 2.

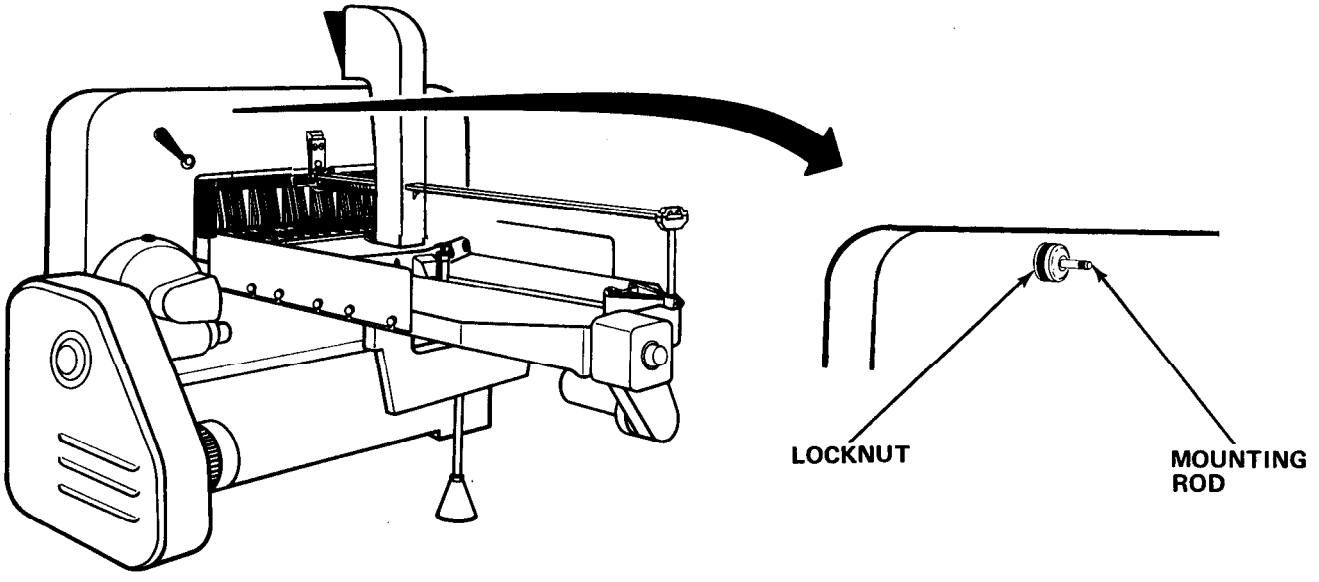
Table 5-6. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

13. OCL TOO WIDE OR FUZZY - Cont

Step 2. Check OCL bulbs adjustment.

Adjust OCL bulbs as follows:



(a) Loosen two locknuts on rear frame holding OCL mounting rods.

(b) Rotate OCL mounting rods while observing cutting line on table. When light from lamp forms clear, sharp line on table, stop. Tighten rod locknut.

(c) Rotate OCL mounting rod for other bulb while observing cutting line on table. When light from lamps forms clear line on table, stop. Tighten rod locknut.

Table 5-6. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
14. OMI INDICATION IS NOT CORRECT. Check setting of vernier hairline.	(a) If out of adjustment, adjust vernier hairline (paragraph 5-6.1f). (b) If adjustment correct, refer to organizational maintenance.
15. IMAGE IN OMI IS NOT CLEAR. Step 1. Remove OMI side panel. Check adjustment of objective lens.	(a) If out of adjustment, adjust object lens (paragraph 5-6.1f). (b) If adjustment is correct, proceed to step 2.

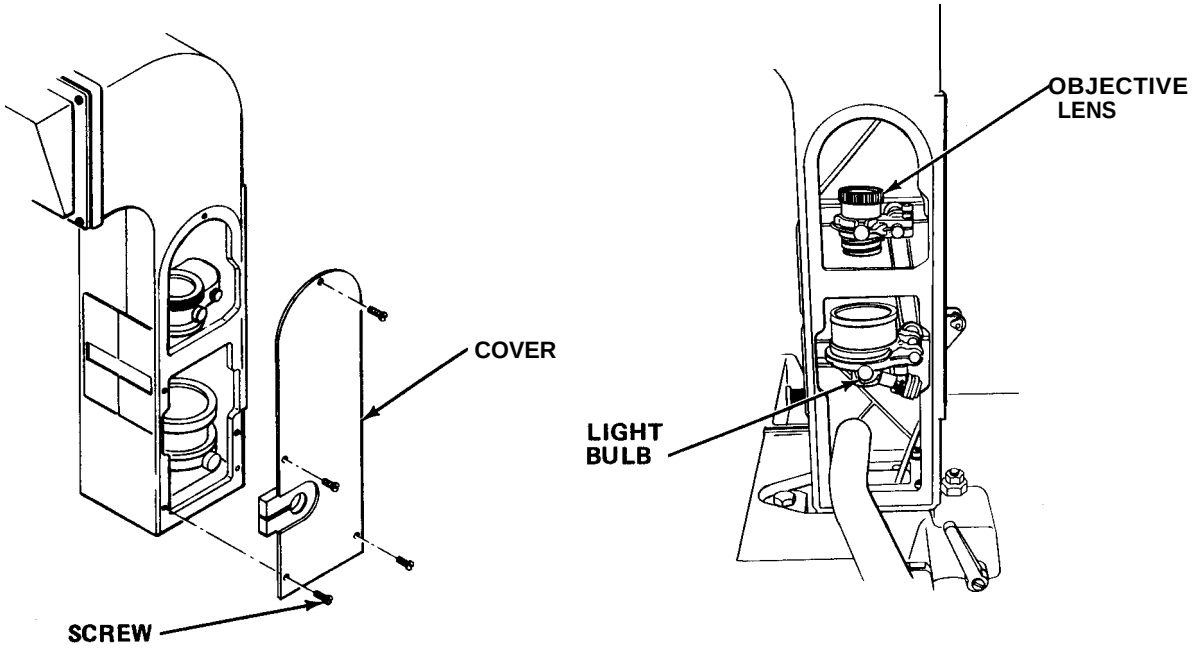
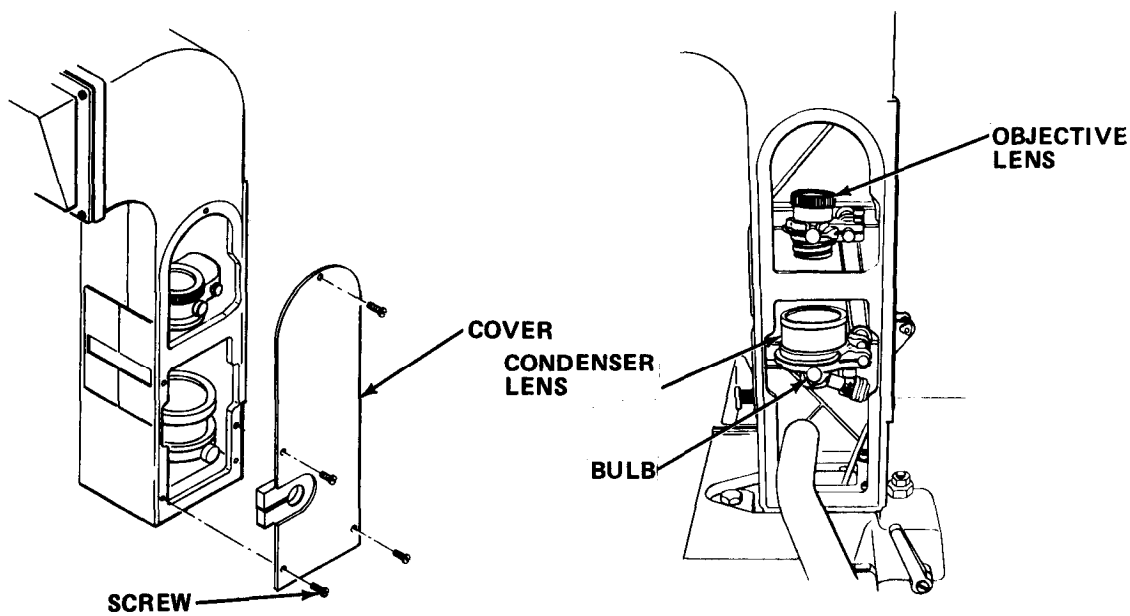


Table 5-6. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
15. IMAGE IN OMI IS NOT CLEAR - Cont	
Step 2. Check bulb adjustment.	
	(a) If out of adjustment, adjust OMI (paragraph 5-6.1f).
	(b) If adjustment correct, check that glass rule is clean.
16. OMI NOT ILLUMINATED OR DIM.	



Step 1. Remove OMI side panel. Check to see if bulb is lit.	
	(a) If bulb is not lit, replace bulb.
	(b) If bulb is lit, proceed to step 2.
Step 2. Be sure that OMI lenses are clean.	
	(a) If lenses are not clean, clean OMI lenses.
	(b) If lenses are cl can, proceed to step 3.

Table 5-6. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
16. OMI NOT ILLUMINATED OR DIM - Cont	
Step 3. Check to be sure OMI bulb and lenses are adjusted properly.	(a) If out of adjustment, adjust OMI (paragraph 5-6.1f). (b) If adjustment is correct, refer to organizational maintenance.
17. MEASURED BACKGAUGE POSITION AND OMI ARE NOT IN AGREEMENT. ADJUSTMENT DOES NOT CORRECT PROBLEM, OR BACKGAUGE POSITION DOES NOT STAY SET.	
Check backgauge guiding rails for dirt or dryness.	(a) If guiding rails are dirty or dry, clean and oil backgauge rails (paragraph 5-11). (b) If malfunction persists, refer to direct/general support maintenance.

5-10. MAINTENANCE PROCEDURES.

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

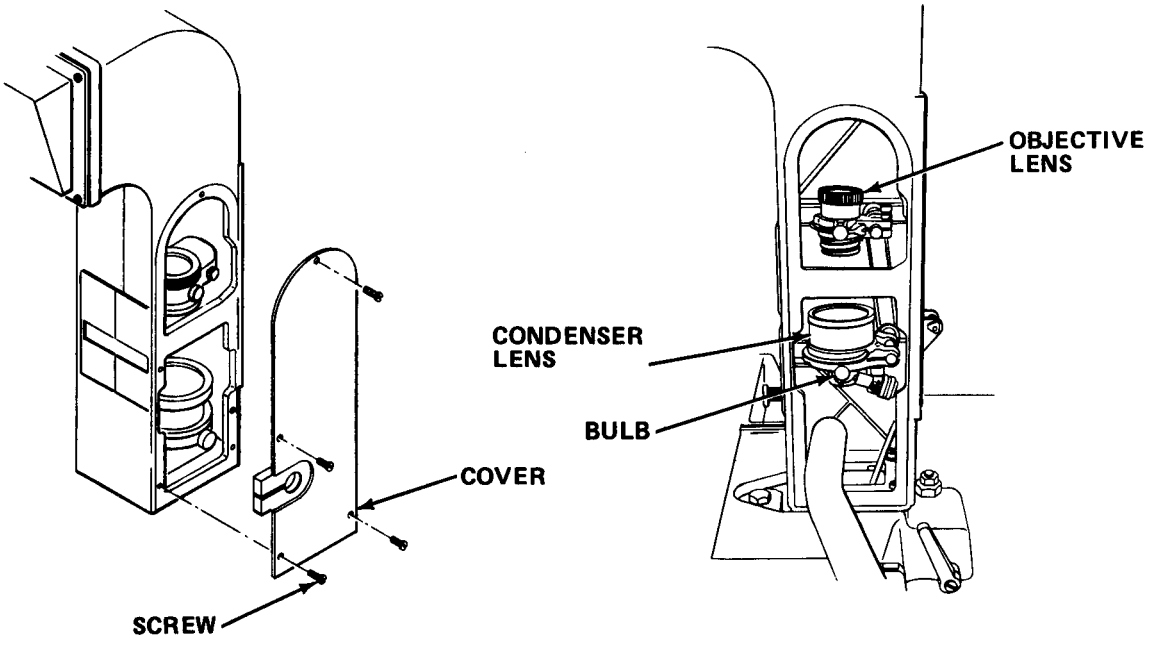
INDEX

5-10.1 Replace OMI Bulb.

MOS: 83F, Photolithographer

TOOLS: Flat Tip Screwdriver

SUPPLIES: OMI Bulb



WARNING

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

a. Turn off power.

(1) Turn main power switch to O position.

(2) Lock safety lock with operator key.

b. Remove four screws which secure cover to housing and remove cover.

c. Remove defective bulb and install new bulb in socket.

d. Turn on power.

(1) Unlock safety lock with operator key.

(2) Turn main power switch to I position.

(3) Press control power on switch.

NOTE

After new bulb is installed, it is necessary to aline bulb filament parallel to condenser lens.

e. Loosen socket and adjust bulb mounting so that bulb filament is parallel to condenser lens and light, shines in center of objective lens, and screen is fully illuminated.

f. Reinstall cover and retaining screws.

g. Turn off power.

(1) Turn main power switch to O position.

(2) Lock safety lock with operator key.

5-10.2 Replace Glass Rule.

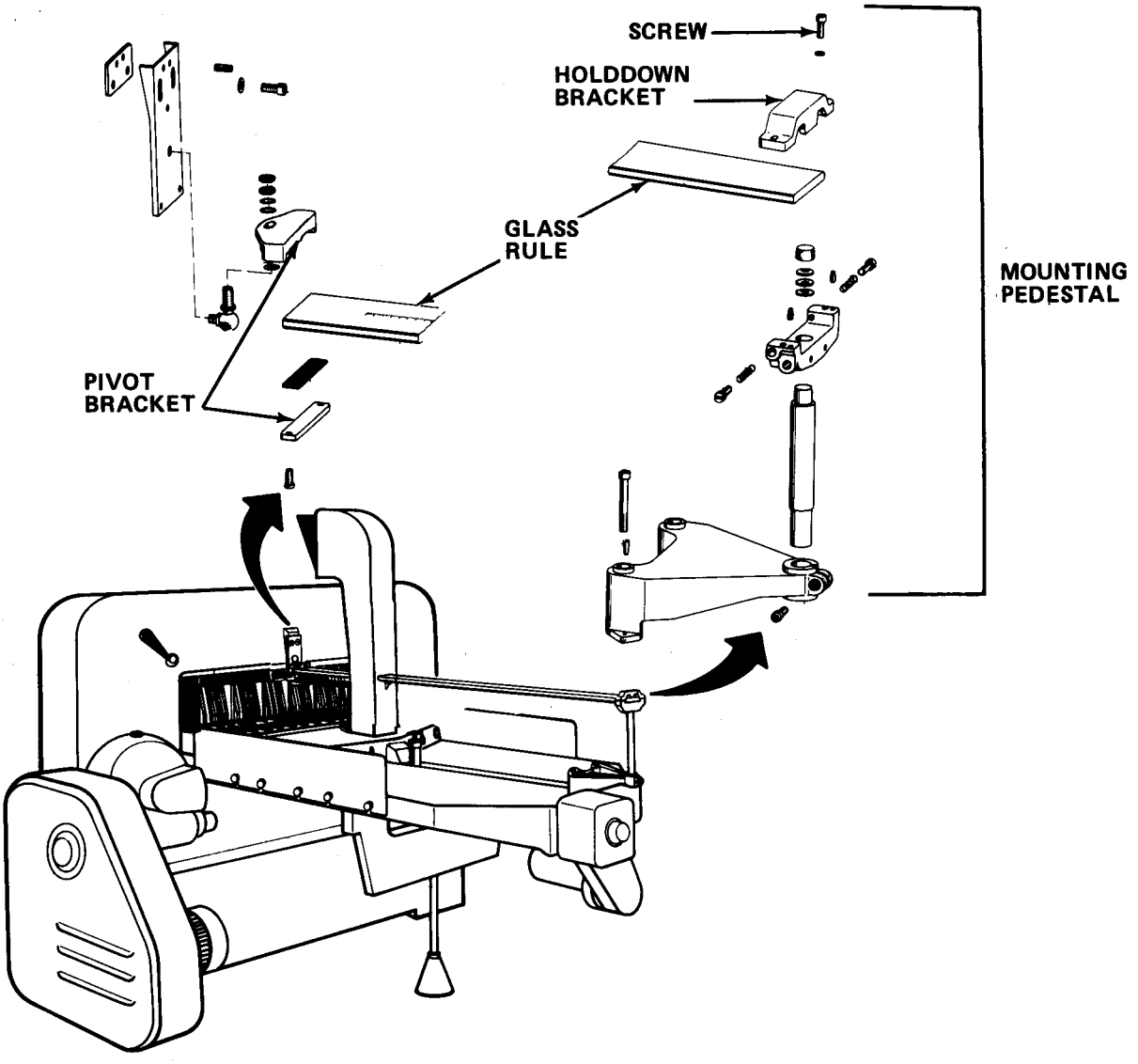
MOS: 83F, Photolithographer

TOOLS: 4 mm Hex Head Key Wrench
Flat Tip Screwdriver

SUPPLIES: Glass Rule

CAUTION

Glass rule is fragile and should be handled with care to prevent breakage.



a. Remove two screws and bracket which secure glass rule to rear mounting pedestal.

b. Remove two screws and bracket which secure glass rule to pivot bracket.

c. Slightly lift rule from mounting pedestal and carefully pull it toward rear, sliding it out of OMI.

NOTE

When storing glass rule, be sure it is carefully packed in storage box.

d. Carrefully insert new glass rule in slot at rear of OMI and slide forward.

e. Insert forward end of glass rule in pivoted bracket and set rear of rule in mounting pedestal.

f. Install holddown bracket and secure with two screws. Tighten screws on pivot bracket.

g. Turn on power.

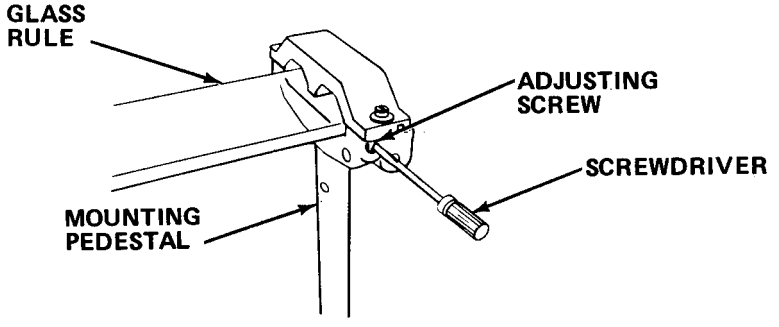
(1) Unlock safety lock with operator key.

(2) Turn main power switch to I position.

(3) Press control power on switch.

h. Move backgauge to its most forward position. Using pencil, place a vertical mark on OMI screen at edge of a graduation mark projected on screen.

i. Move backgauge to its most rearward position. If pencil mark is no longer at same position in relation to projected graduation marks, glass rule must be adjusted.



j. Using two adjusting screws located on either side of mounting pedestal, move glass rule from side to side until pencil mark on OMI screen coincides with edge of projected graduation marks.

k. Clean glass rule with glass cleaner and cheesecloth.

l. Turn off power.

(1) Turn main power switch to O position.

(2) Lock safety lock with operator key.

5-10.3 Rotate or Replace Cutting Stick.

MOS: 83F, Photolithographer

TOOLS: Flat Tip Screwdriver
Soft Face Hammer

SUPPLIES: Cutting Stick

WARNING

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

CAUTION

Use care when removing or installing cutting stick to avoid damaging bed groove.

a. Turn off power.

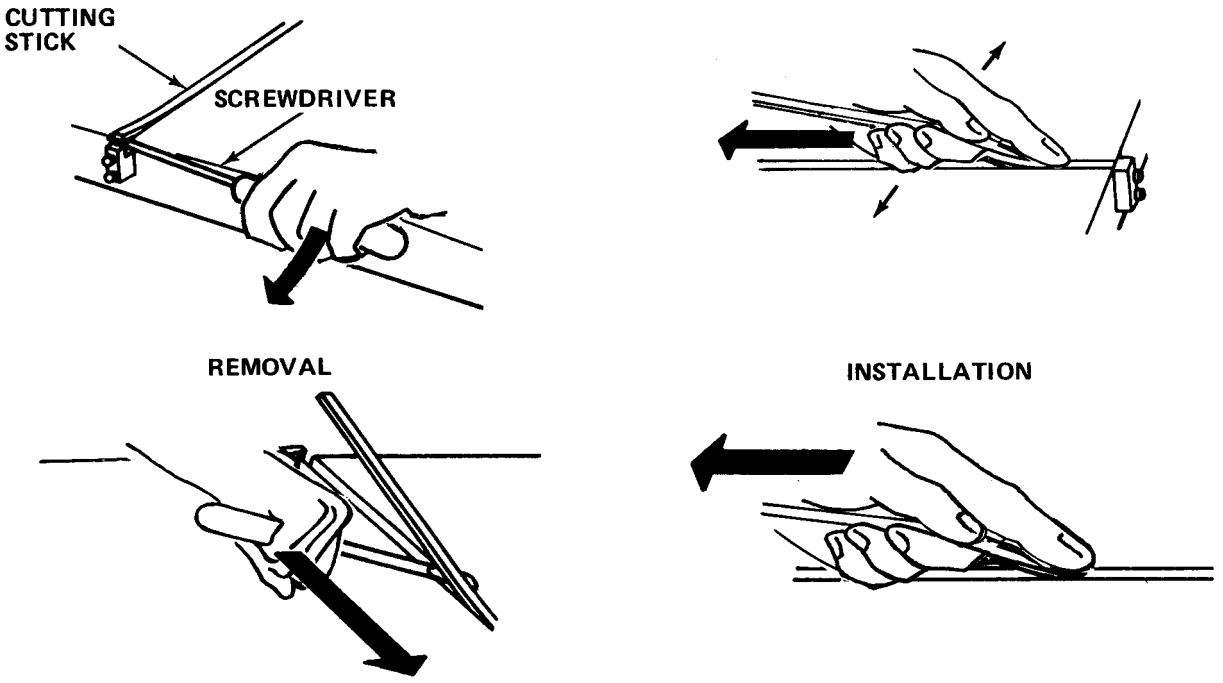
(1) Turn main power switch to O position.

(2) Lock safety lock with operator key.

b. Insert screwdriver under end of cutting stick and carefully pry upward.

c. Remove cutting stick from groove.

d. Rotate cutting stick to new position or replace with new stick.



e. Reinstall cutting stick into groove.

f. Move stick back and forth with right hand as left hand presses it into groove.

CAUTION

Do not seat cutting stick with any metallic tool, or damage to table bed may occur.

g. Seat cutting stick into groove with soft face hammer.

5-10.4 Replace Fluorescent Lamp or Starter.

MOS: 83F, Photolithographer

SUPPLIES: Fluorescent Lamp
Starter

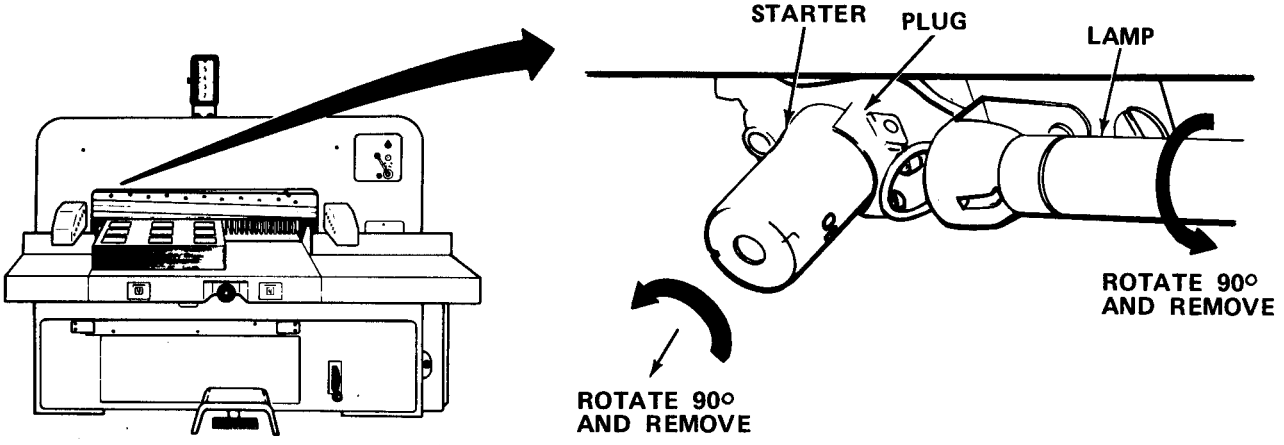
WARNING

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

a. Turn off power.

(1) Turn main power switch to O position.

(2) Lock safety lock with operator key.



b. Grasp defective lamp or starter with fingers and rotate 90 degrees.

c. Extract lamp or starter from holders.

d. Insert new lamp or starter and twist 90 degrees to lock into position.

5-10.5 Replace OCL Lamp(s).

MOS: 83F, Photolithographer

TOOLS: 6 mm Hex Head Key Wrench

SUPPLIES: Lamp

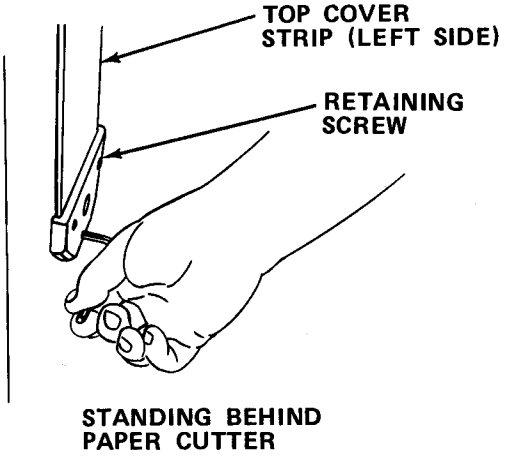
WARNING

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

a. Turn off power.

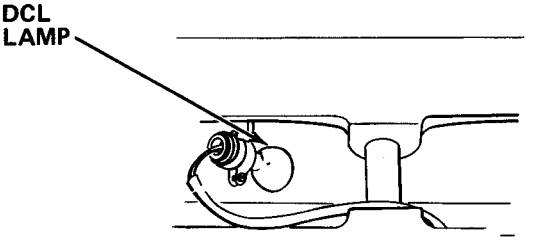
(1) Turn main power switch to O position.

(2) Lock safety lock with operator key.



STANDING BEHIND
PAPER CUTTER

b. Remove hex head screw holding left end of top cover and position the cover so that easy access to lamps is obtained.



LOOKING DOWN AT
TOP OF FRAME

c. Grasp defective lamp with fingers and rotate left to remove.

d. Install new lamp and rotate it to the right to secure.

e. Reinstall top cover and secure with screw.

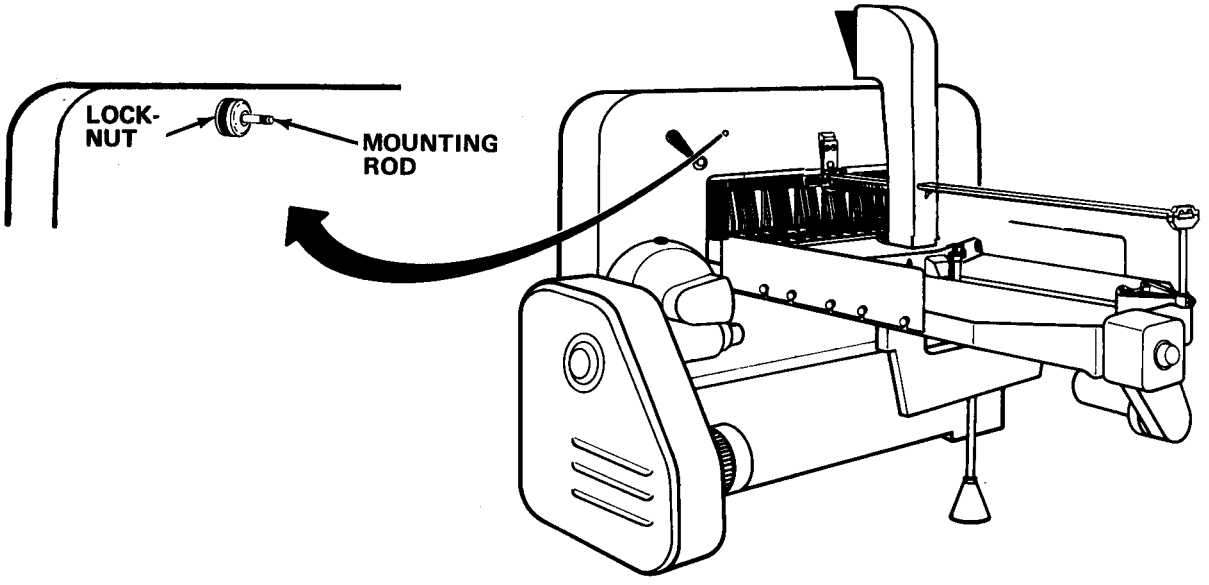
f. Turn on power.

(1) Unlock safety lock with operator key.

(2) Turn main power switch to I position.

(3) Press control power on switch.

g. Place table lamp switch to the left.



h. Loosen locknut on mounting rod for new OCL lamp and adjust mounting rod until cutting line is bright and sharp. Tighten locknut.

i. Turn off power.

(1) Turn main power switch to O position.

(2) Lock safety lock with operator key.

Section IV ORGANIZATIONAL MAINTENANCE

5-11 LUBRICATION INSTRUCTIONS.

5-11.1 Hard time intervals and the related man-hour times are based on normal operation. The man-hour time specified is the time you need to do all the services prescribed for a particular interval. Change the interval if your lubricants are contaminated or if You are operating the equipment under adverse operating conditions, including longer-than-usual operating hours. The interval may be extended during periods of low activity. If extended period of low activity is anticipated, adequate preservation precautions must be taken.

5-11.2 On-condition (OC) intervals for oil changes shall be determined by the Army Oil Analysis Program (AOAP) laboratory and shall be applied unless otherwise notified.

5-11.3 Hard time oil change intervals will be applied in the event AOAP laboratory support is not available.

5-11.4 The time specified is the time required to perform all services at the particular interval (on-condition or hard times).

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).

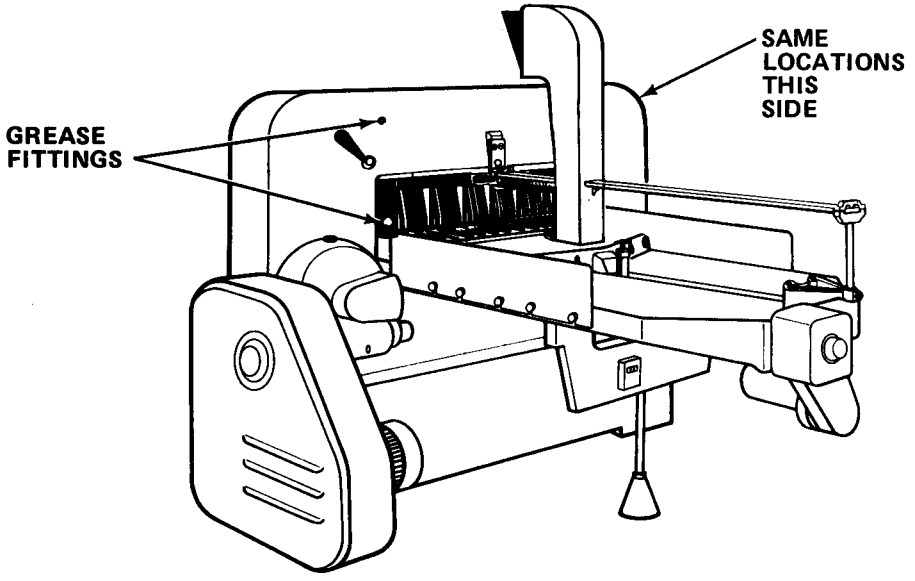
5-11.5 Clean fittings before lubricating. Clean parts with dry cleaning solvent. Dry before lubricating. Drain gear box and hydraulic reservoir when hot. Fill and check levels. The lowest level of maintenance authorized to lubricate a point is organizational maintenance.

NOTE

To avoid having to bleed the hydraulic system twice, always do annual lubrications together.

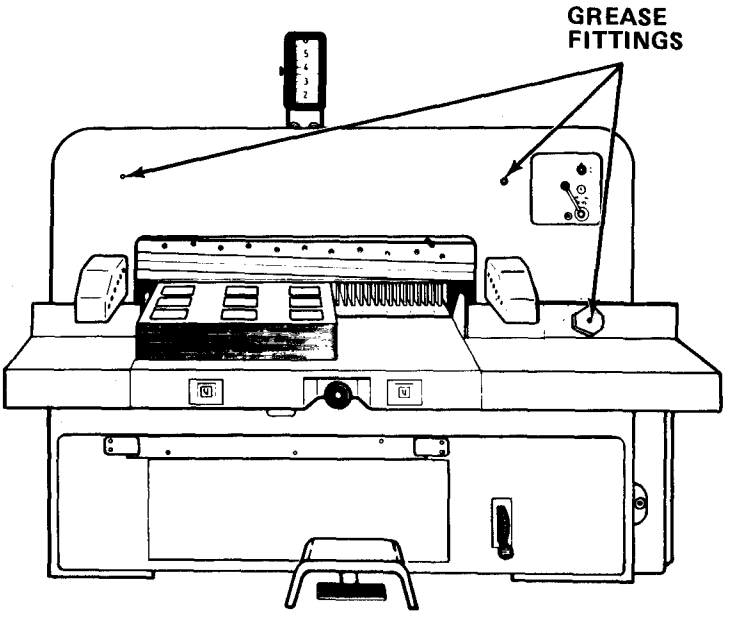
5-11.6 Perform lubrications with the paper cutter off.

	LUBRICANT	INTERVAL
Knife guiding gibs (See Note 1)	GAA	W
Clamp guiding rails (See Note 1)	GAA	W
Rear frame guiding grooves (See Note 1)	GAA	W

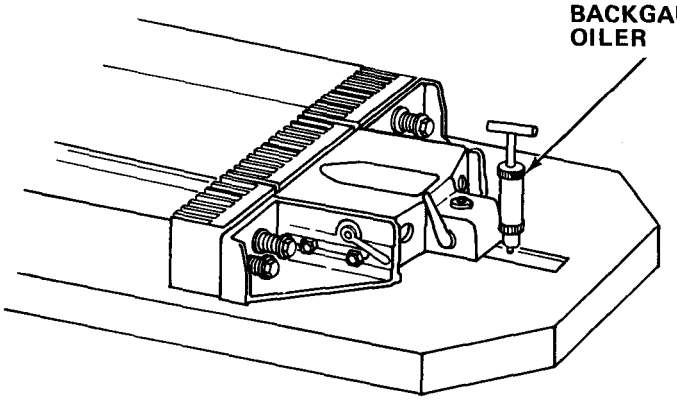


Front frame guiding grooves (See Note 1)	GAA	W
Connecting Rod Pivot (See Note 1)	GAA	W

	LUBRICANT	INTERVAL

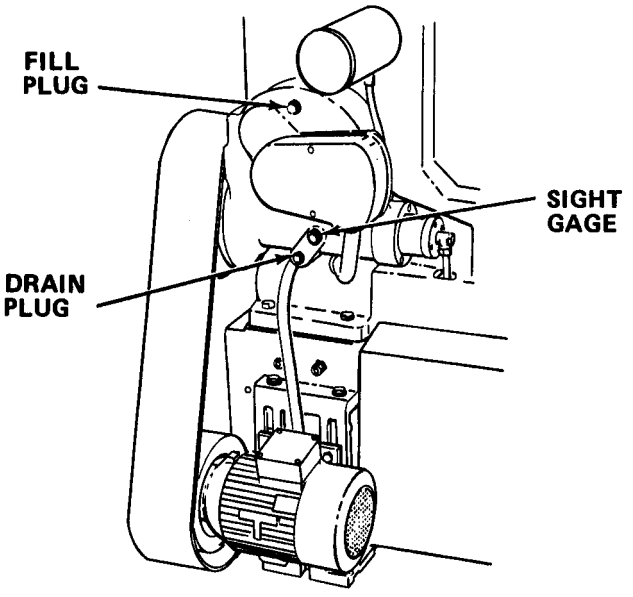


Backgauge guiding rails and sledge:
Lubricate by rotating T handle 1 complete turn, fill oiler with oil as required.

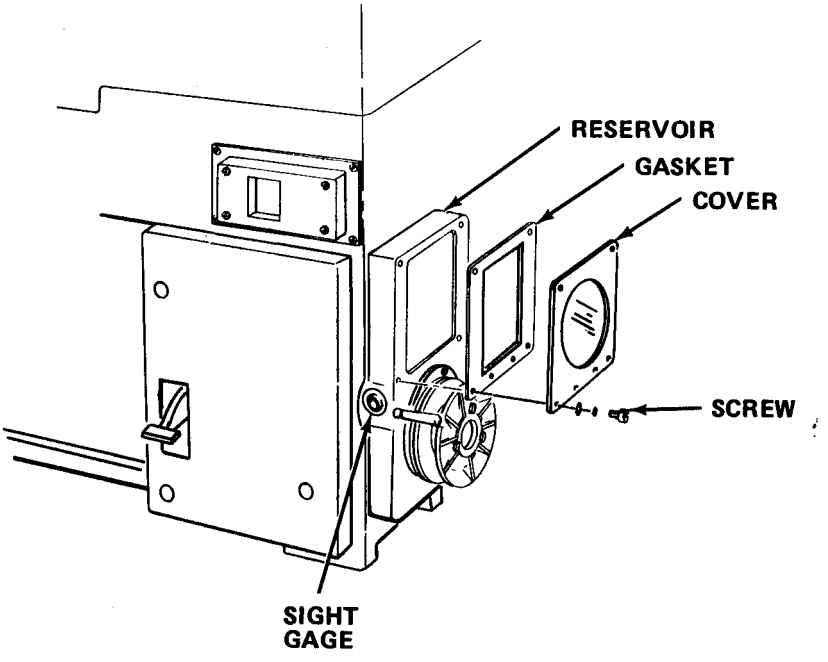


Main drive gear drain (See Note 2)	GO-90	A

	LUBRICANT	INTERVAL



Hydraulic reservoir (See Note 3)	OHA	A



KEY

TOTAL MAN-HR

INTERVAL	MAN-HR
A	2.5
B	0.5

LUBRICANT		REFILL CAPACITY
GAA (MIL-G-10924)	Grease, bearing	
	all points	As required
	Lubricating oil, HDO 30	
	Backgauge	1 pt
GO90 (MIL-L-2105)	Gear Oil, 90 wt	
	Main drive gear	0.6 liters (0.52 qts)
	Hydraulic fluid petroleum base	
	Hydraulic reservoir	17 liters (4.5 gals)

GREASE FITTINGS. Every 20 hours of operation, all grease fittings will be lubricated (GAA). To grease, simply insert the grease gun and pump the handle twice.

MAIN DRIVE GEAR. Remove drain plug and drain gear lubricant into a pan. Dispose of lubricant. Clean and reinstall plug. To refill, remove fill plug and fill with 0.6 liters (0.52 qts) of gear oil (GO90) to bring oil level to bottom of fill hole. Reinstall fill plug.

3. HYDRAULIC RESERVOIR. Remove the main drive motor V-belts cover. Remove the side reservoir cover and gasket located above the pump pulley. Using a fluid evacuation pump, pump all hydraulic fluid out of hydraulic reservoir and into a 5 gallon pail. Service hydraulic oil filter (paragraph 5-20.6). To fill, simply pour 17 liters (4.5 gals) of hydraulic fluid (OHA) into the reservoir to bring the oil level to the top of the sight glass. Perform a complete bleed of the hydraulic system (paragraph 5-20.23).

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. Special Tools, TMDE, and Support Equipment is listed in the applicable repair parts and special tools list and in Appendix B of this manual.

5-12.3 Repair Parts. Repair parts are listed and illustrated in the Repair Parts and Special Tools List, TM 5-3610-253-24P covering organizational maintenance for this equipment.

5-13. SERVICE UPON RECEIPT.

NOTE

Minimum of four persons are required to service the paper cutter.

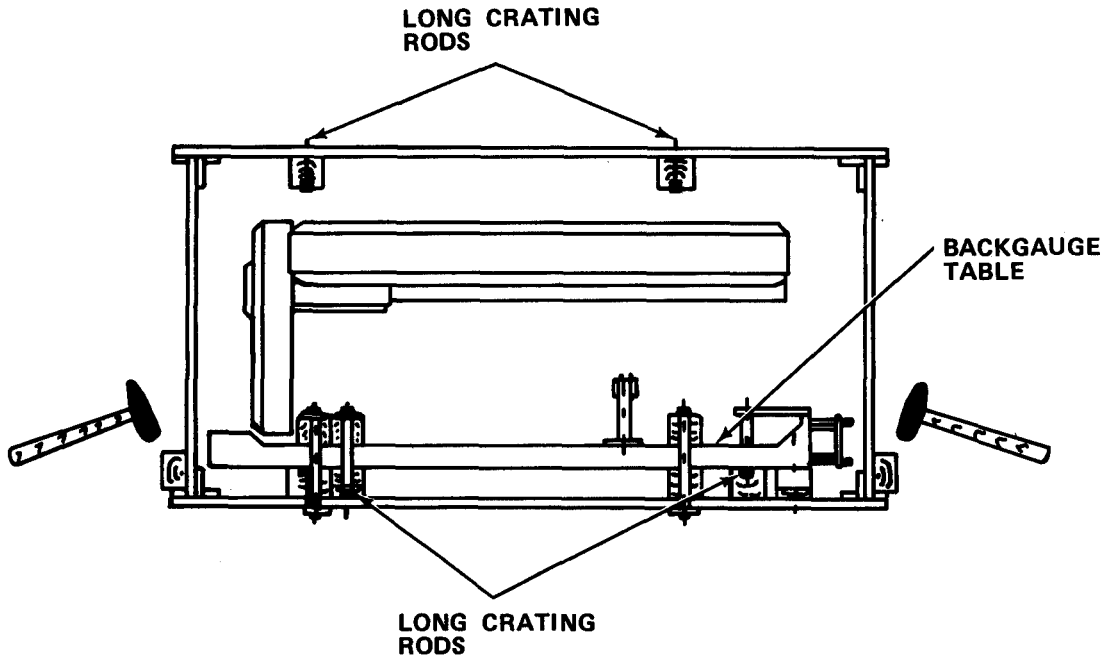
a. The following sequence of steps are used to unpack the crate.

NOTE

The frame is mounted on two skids. The table is secured between wood beams and the table brake protected by a wood crate. Individual parts and accessories are packed in a wood box.

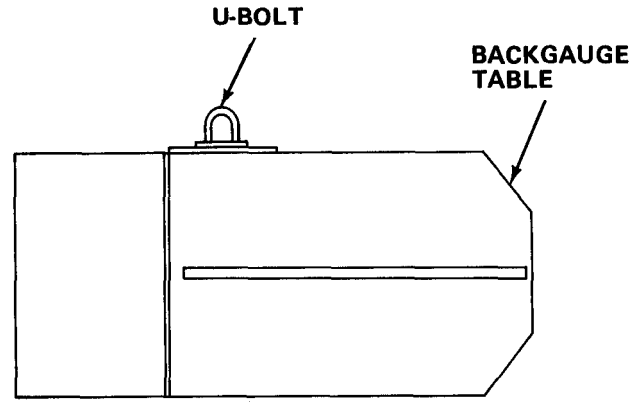
wood blocks Lift the crate approximately 10 cm (4 in.) off the ground and place under all four corners.

(2) Remove nuts on the top of the crate and lift off the lid.



(3) Remove nuts on bottom of the box and take out the long crating rods.

(4) Mount a U-bolt to the side of the backgauge table.



(5) Fix a hoist to the U-bolt and apply tension on the hoist.

(6) Using a hammer, knock loose the side wall on which the table is connected.

NOTE

All nails have to be removed by pliers or a nail puller; otherwise the side walls cannot be removed from the crate.

WARNING

Serious injury may occur if inadequate number of personnel are used to move the backgauge table and side wall. This equipment weighs 1000 lbs.

(7) Lift the hoist and remove the backgauge table and side wall from the crate.

(8) Remove nuts and bolts on side wall that are securing table to side wall. Then remove side wall.

(9) Remove two short side walls.

(10) Remove backgauge from crate.

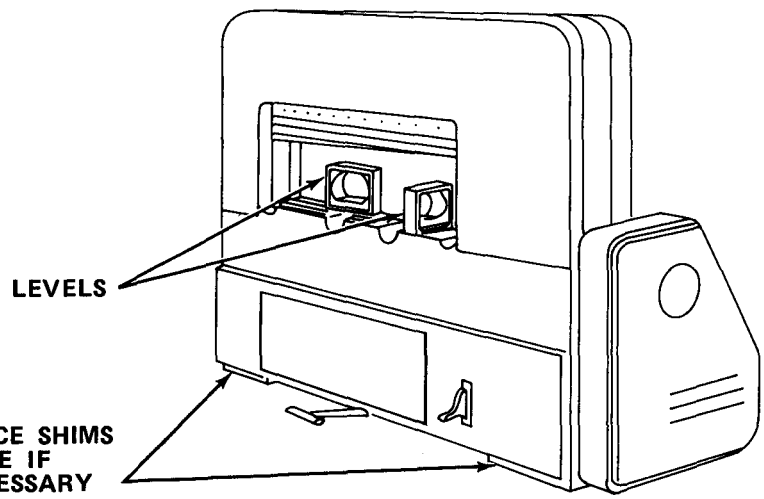
(11) Carefully set the backgauge table down flat on to floor so that the table rests on the wood blocks attached to table.

(12) Fix hoist to main frame and apply tension on the hoist.

(13) Remove nuts on the frame pillars and push down the bolts.

WARNING

Serious injury may occur if an inadequate number of personnel are used to move the paper cutter. This equipment weighs 3600 lbs.



(14) Remove main frame from crate and position onto mounting frame. Using a level, be sure that the frame is level.. If necessary, place shims under the right or left pillar as needed. Then secure in place with mounting bolts.

(15) Check carefully that all parts have been removed from the box.

b. This crate can be used to ship the defective paper cutter and should not be destroyed.

5-13.1 CheckinK Unpacked Equipment.

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

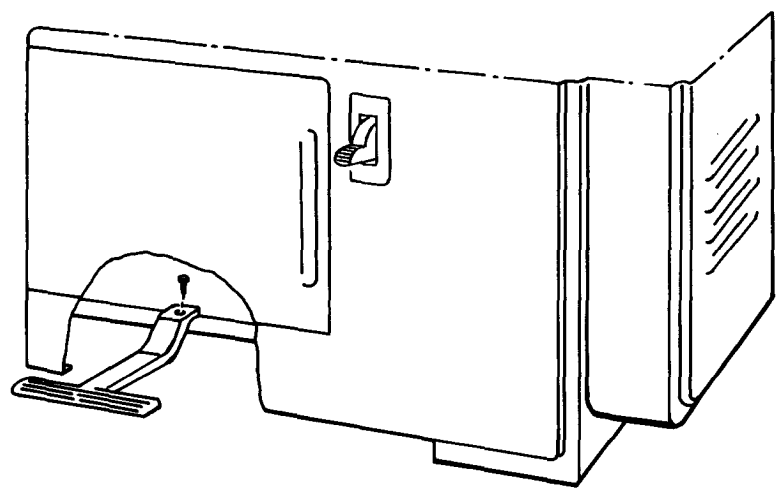
b. Check the equipment against the packing list to see f the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

c. Check to see whether the equipment has been modified

5-13.2 Deprocessing Unpacked Equipment.

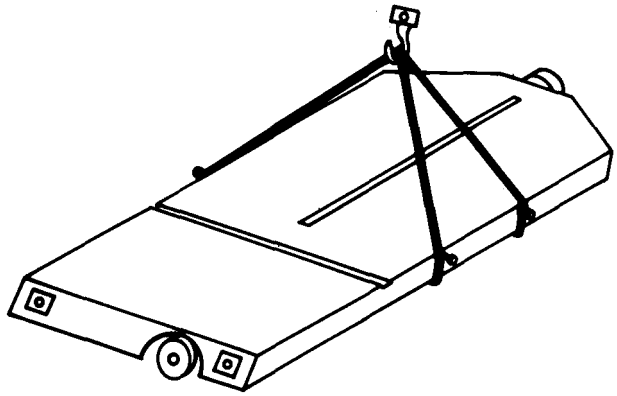
a. The following sequence of steps are used to complete the assembly of the paper cutter.

(1) Remove the rear electronics enclosure cover.



(2) Install the clamp foot pedal (paragraph 5-16. 10).

(3) Remove all rust protection film and dirt from table surfaces.

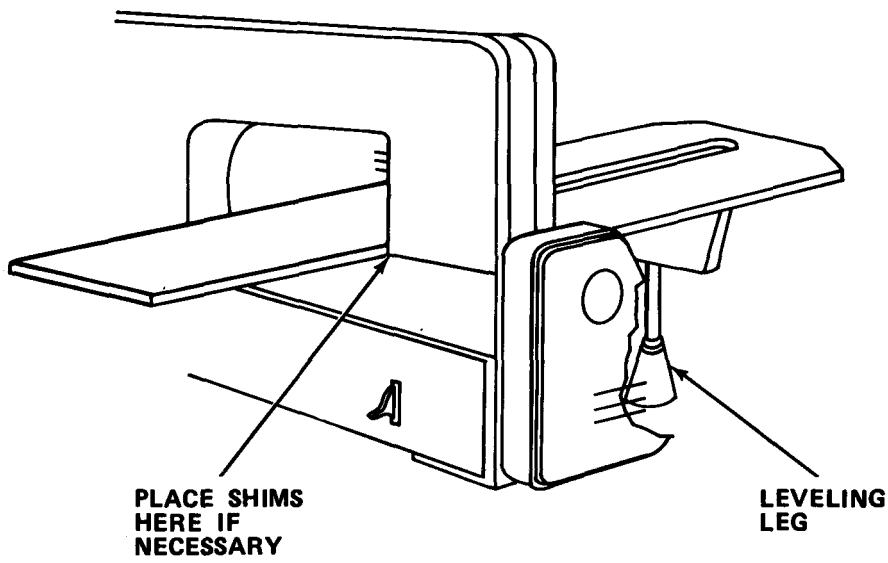


(4) Connect hoist to table in a manner that will allow the top surface to be parallel with the floor when lifting the table.

WARNING

Serious injury may occur if inadequate number of personnel are used to move the table. This equipment weighs 1000 lbs.

(5) Lift the table and direct it behind the frame and into the opening of the frame.



(6) Place the rear support leg under the table and lower hoist so that the table rests on the support leg.

(7) Using a level, level the table with the support leg and add shims if necessary between the table and the frame.

(8) Secure table to frame using al 1 screws.

(9) Remove hoist from table.

(10) Connect all electrical connectors to the proper connections in the electronics enclosure.

(11) Install the left and right light barrier housings to front frame, ensuring that the housing is square to the table and frame.

(12) Connect light barrier plug connectors.

(13) Install the right and left side tables and secure in place with bolts.

(14) Install the table sides to the backgauge table.

(15) Secure the backgauge table to the mounting frame.

(16) Install main motor V-belts (paragraph 5-16.4).

(17) Remove rust protection film and dirt from around and on the sledge.

(18) Install the backgauge onto the sledge. Make sure that all concave washers are fitted between the concave spacer and backgauge. This will give the proper distance 3 mm (.12 in.) between the backgauge and the table.

(19) Install cutting stick (paragraph 5-10.3 steps e through g).

(20) Install paper cutter into van (paragraph 5-20. 18).

5-13.3 Prepare the Paper Cutter for Use.

a. Clean the paper cutter as follows:

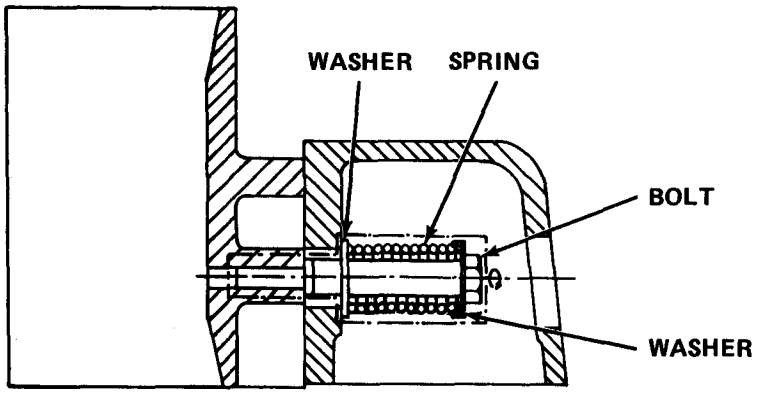
WARNING

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).

(1) Using P-D-680 cleaning solvent, clean all grease from the bed assembly and surfaces including sides and front table.

NOTE

Use care in removing center rake to avoid dropping bolts.



(2) Remove backgauge rakes by removing bolts, washers, and springs holding rake to backgauge. Clean bottom and front surfaces of rakes.

NOTE

- Use care in reinstalling center rake to avoid dropping bolts.
- Ensure rakes are flush with table so that one piece of paper can not slide under rakes.

(3) Reinstall backgauge rakes using bolts, washers and springs. Tighten bolts, then loosen bolts 1/2 turn.

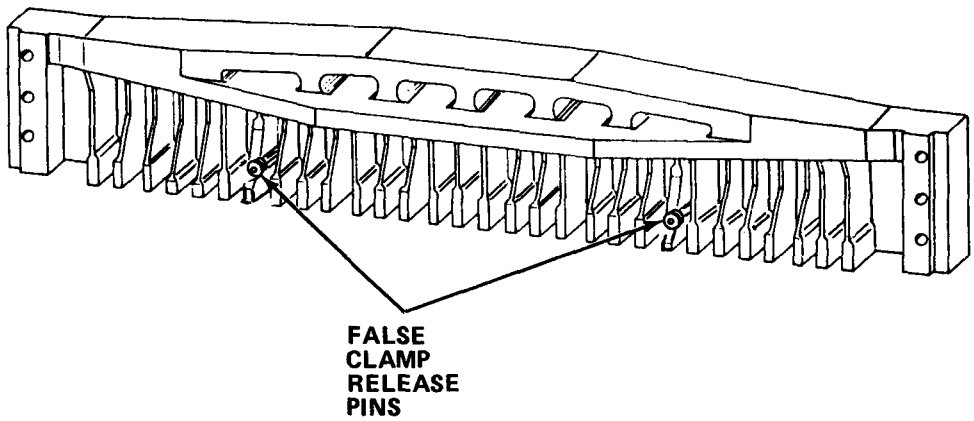
b. Perform light barrier focusing (paragraph 5-16.19, steps a-c, and i).

c. Clean knife and knife carrier and perform knife adjustments (paragraph 5-16.13).

d. Clean false clamp and clamp as follows.

(1) Lower clamp to 2 in. above table.

(2) Rotate knife change lever to knife changing position.



(3) Remove false clamp by pulling out on false clamp release pins and locking them off.

(4) Clean the false clamp and clamp.

(5) Reinstall false clamp in storage location under the table.

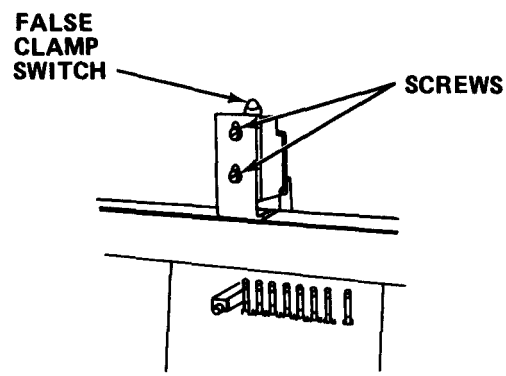
(6) Rotate the knife changing 1 ever back to normal position and raise the clamp.

e. Check that knife is square with backgauge by performing backgauge angle adjustment procedure (paragraph 5-16.25).

f. Adjust OCL by loosening locking nuts and moving mounting rod in and out, and around, until cutting line is bright and sharp.

g. Oil backgauge in accordance with paragraph 5-11, lubrication instructions.

h. Check adjustment of false clamp switch (S6) by moving the backgauge fully forward. Be sure the backgauge rakes come far enough up to intertwine with the rakes of the clamp. Perform following steps if adjustment is required:



(1) Remove front electronics enclosure cover.

(2) Loosen screws on false clamp switch and move it up or down until switch is activated by false clamp.

(3) Reinstall front electronics enclosure cover.

i. Wax table surfaces as follows:

(1) Turn main power switch to O position.

(2) Using operator key, lock the safety lock.

(3) Wax (Item 30, Appendix E) all table surfaces.

j. Adjust backgauge (paragraph 5-16.22).

k. Adjust table stop bolts and limit switches (paragraph 5-16.24).

l. Bleed hydraulic system (paragraph 5-20.23).

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

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

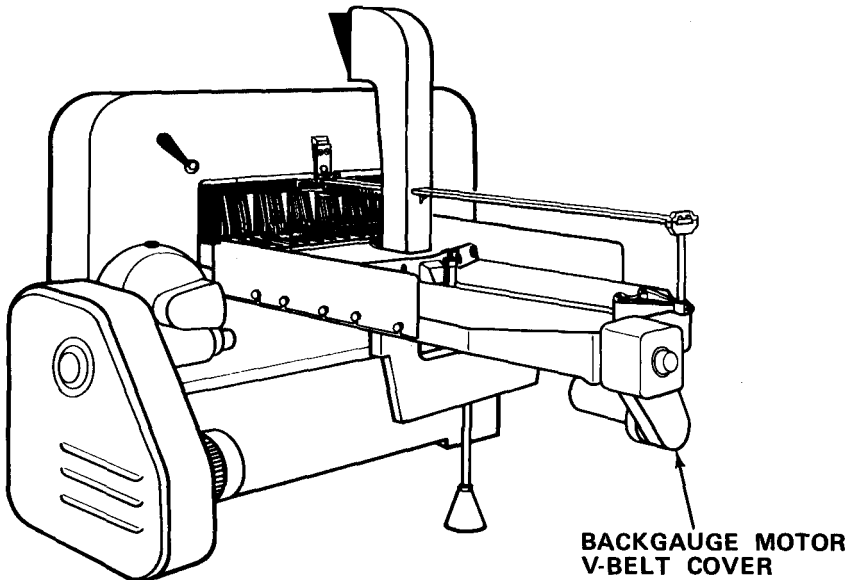
e. List of tools and materials required for PMCS is as follows:

Item	Quantity
19 mm Combination Wrench	1 ea
13 mm Combination Wrench	1 ea
Flat Tip Screwdriver	1 ea

Table 5-7. 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.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PAPER CUTTER
1	M	Inspect Backgauge V-Belts.
		1. Turn off power.
		(a) Turn main power switch to O position.
		(b) Lock safety lock with operator key.
		2. Remove backgauge motor V-belt cover.



		3. Inspect V-belt for wear, cracking, or oil deposits. Replace if defective.

Table 5-7. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PAPER CUTTER - Cont
1	M	Inspect Backgauge V-Belts - Cont 4. Check V-belt deflection. Deflection should be 6-9 mm (1/4 - 3/8 in.). If deflection differs from specifications, adjust V-belt by: (a) Loosen backgauge mounting bolts. (b) Slide backgauge motor outward to tighten V-belt. (c) Tighten four mounting bolts. 5. Reinstall backgauge motor V-belt cover.
2	M	Inspect Main Motor V-Belts. 1. Turn off power. (a) Turn main power switch to O position. (b) Lock safety lock with operator key. 2. Remove main motor V-belt cover.

Table 5-7. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO,	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PAPER CUTTER - Cont
2	M	Inspect Main Motor V-Belts - Cont

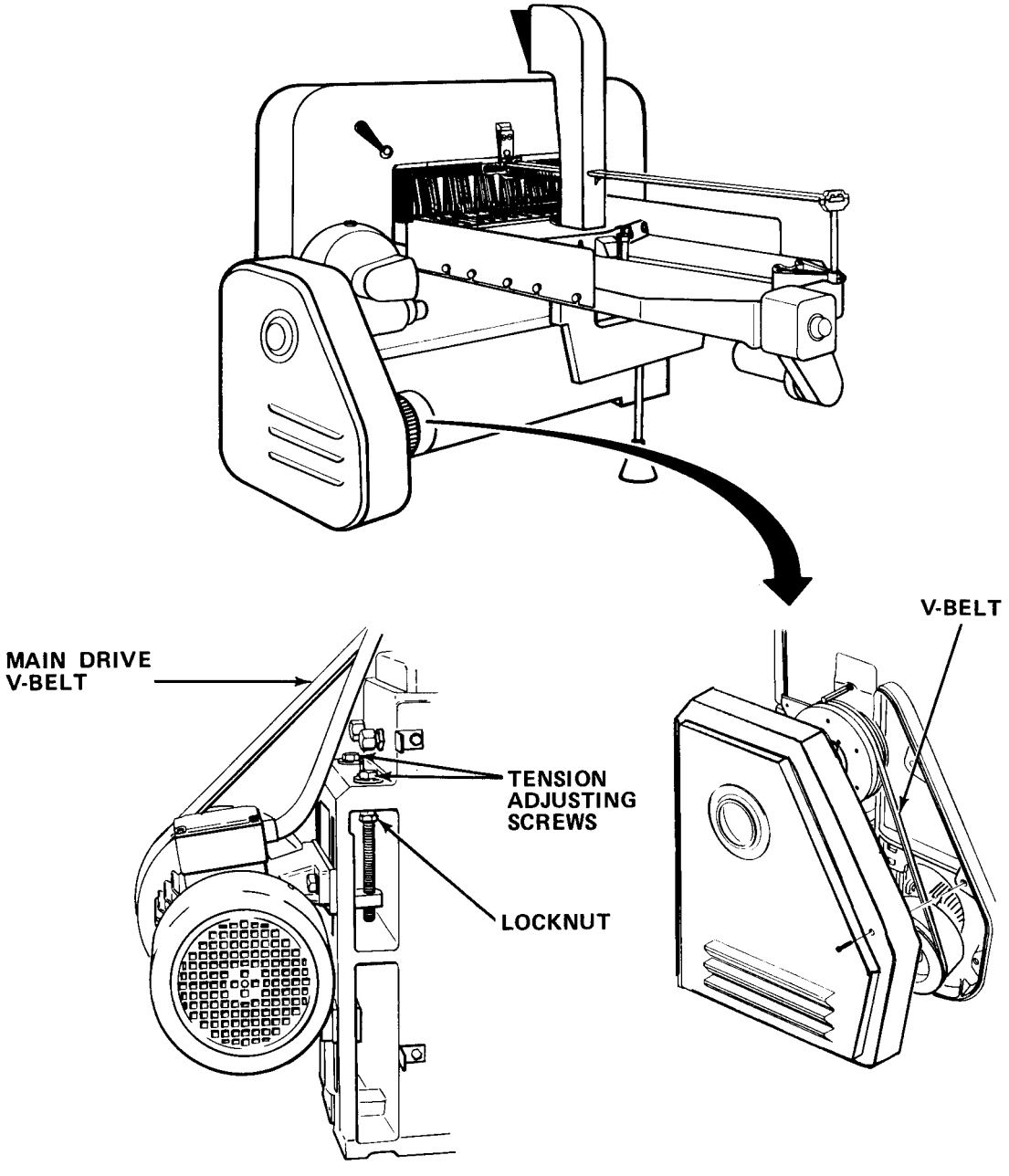


Table 5-7. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PAPER CUTTER - Cont
2	M	Inspect Main Motor V-Belts - Cont
		3. Check V-belts for wear, cracking or oil deposits. Replace if defective.
		4. Check V-belts deflection. Deflection should be 10 mm (3/8 in.). If deflection differs from specifications, adjust V-belts by:
		(a) Loosen locknuts on underside of motor adjusting mount.
		(b) Turn adjusting bolts to the right to tighten V-belts, or to the left to loosen V-belts. Be sure to turn both bolts the same amount each time to keep pulley alinement.
		(c) Tighten locknuts on underside of motor adjusting mount.
		5. Reinstall main motor V-belt cover.

5-15. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES.

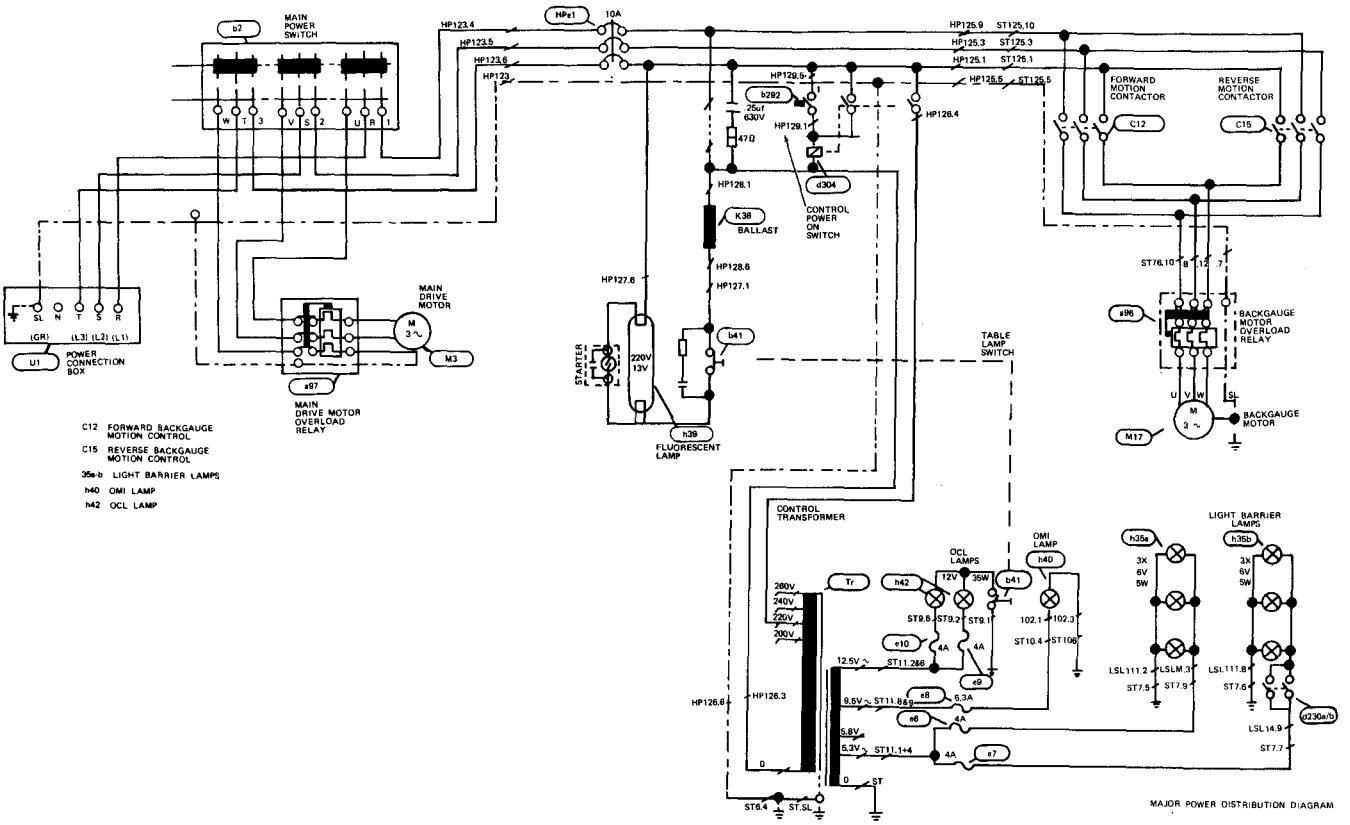
a. Organizational troubleshooting procedures cover the most common malfunctions that may be repaired at the organizational level. Repair or adjustment requiring specialized equipment is not authorized unless such equipment is available. Troubleshooting procedures used by the operator should be conducted 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 and/or the foldout located at the end of this manual for further fault analysis.

d. Prior to using the troubleshooting procedures for electrical malfunctions, always check plug connections and fuses.

e. Prior to using the troubleshooting procedures for hydraulic malfunctions, always check for loose or leaky pipe connections.



SYMPTOM INDEX

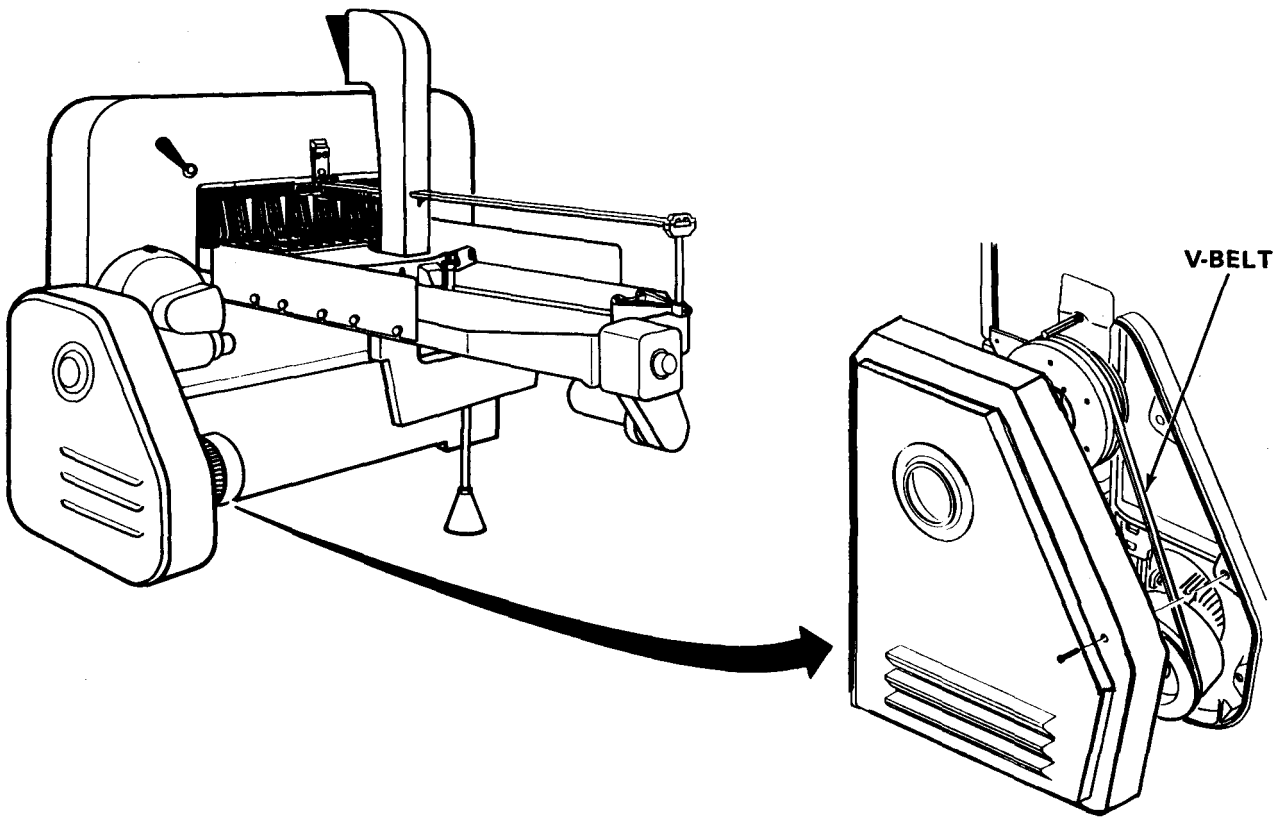
SYMPTOM INDEX - Cont

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. MACHINE DOES NOT CUT THROUGH MATERIAL.
Step 1. Check for dull knife.
(a) If knife is dull, replace knife (paragraph 5-16.13).
(b) If not, proceed to step 2.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. MACHINE DOES NOT CUT THROUGH MATERIAL - Cont
Step 2. Check main motor V-belts for proper tension.
(a) If V-belt is out of adjustment, perform V-belt adjustment for a 10 mm (3/8 in.) deflection (paragraph 5-14).



(b) If not, proceed to step 3.

Step 3. Check main motor V-belts for fray or wear.

(a) If frayed or worn, replace V-belts (paragraph 5-16.4).

(b) If not, proceed to step 4.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

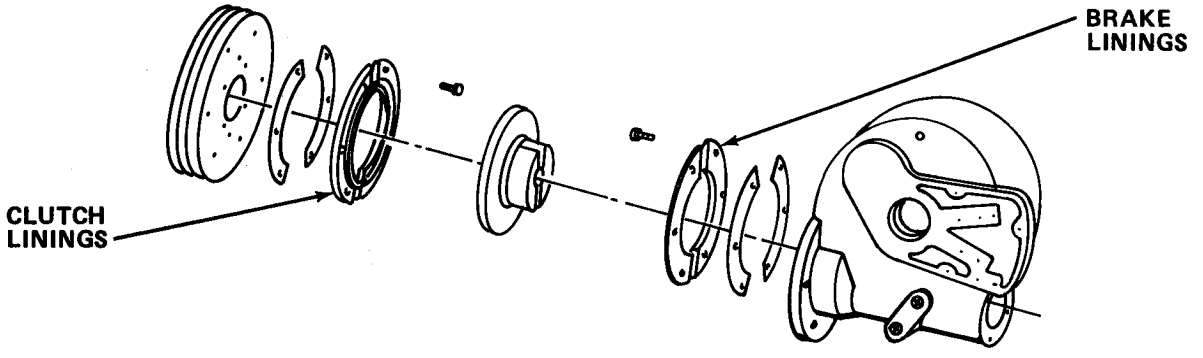
1. MACHINE DOES NOT CUT THROUGH MATERIAL - Cont

Step 4. Check main motor V-belts for oil.

(a) If belt is contaminated with oil, repair oil leak and replace V-belts (paragraph 5-16.4) and refer to direct/general support maintenance for correction of class III oil leak.

(b) If not, proceed to step 5.

Step 5. Check for oil on brake and clutch linings.



(a) If contaminated, clean clutch and brake linings and check hydraulic components and connections for leaks.

(b) If leaks are present, refer to direct/general support maintenance for repair of class III leakage.

(c) If not replace clutch and/or brake linings (paragraph 5-16.1).

2. BOTTOM SHEET OF MATERIAL IS CUT ONLY ON ONE SIDE OR NOT AT ALL.

Check that the knife is not parallel to the table.

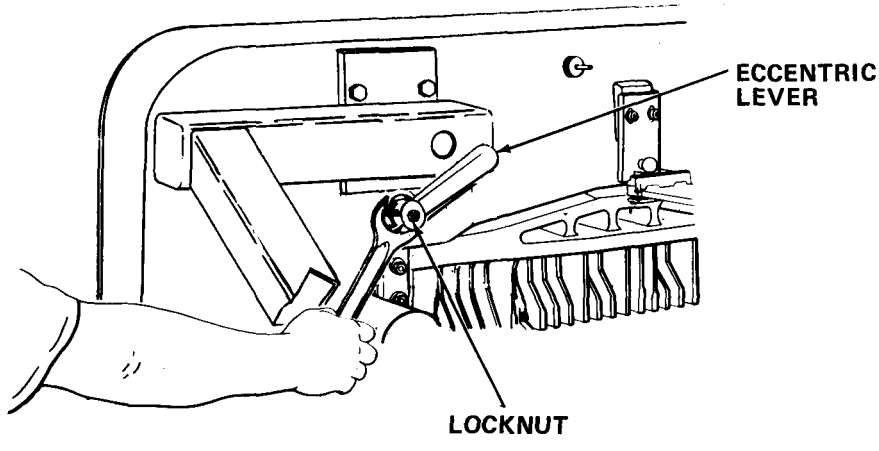
Correct for proper parallel cut as follows:

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

2. BOTTOM SHEET OF MATERIAL IS CUT ONLY ON ONE SIDE OR NOT AT ALL - Cont



(a) Loosen the locknut on the eccentric for the side that does not cut.

(b) Using the handle, rotate the eccentric and lower the knife.

(c) Tighten the locknut and check with another cut.

NOTE

If eccentric cannot be adjusted enough to correct the problem, perform steps (d) through (g).

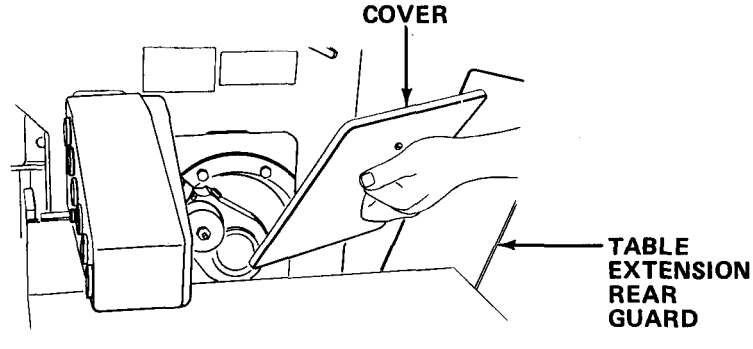
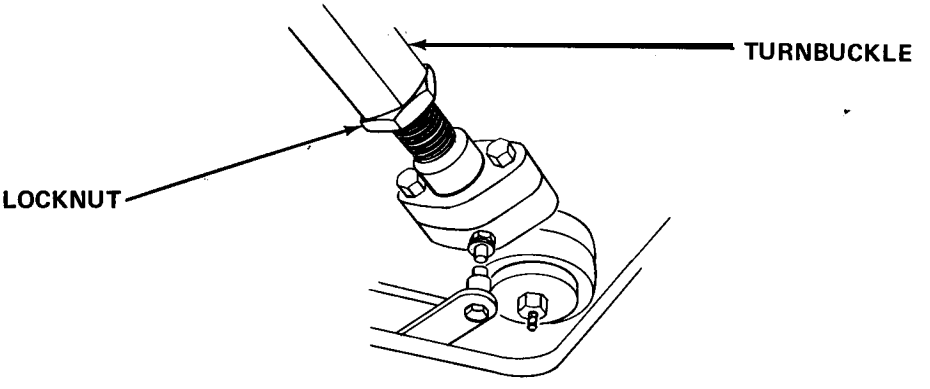


Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
2. BOTTOM SHEET OF MATERIAL IS CUT ONLY ON ONE SIDE OR NOT AT ALL - Cont	
	(d) Remove the eccentric cover.



	(e) Loosen the locknuts on the turnbuckle.
	(f) Turn the turnbuckle 1/4 of a turn and then make a cut. Continue to repeat steps (a) through (f) until problem is corrected.
	(g) Tighten turnbuckle locknuts, and reinstall eccentric cover.
3. OVERCUT DURING THE CUT.	

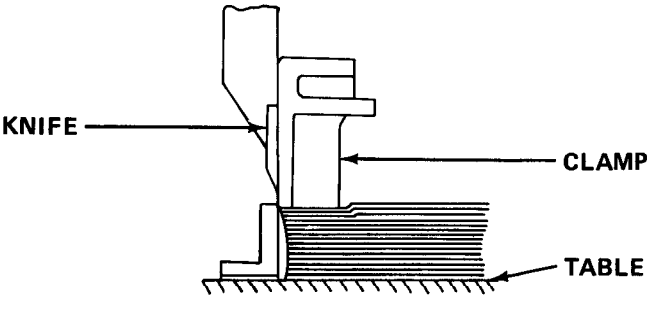


Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

3. OVERCUT DURING THE CUT - Cont

WARNING

- Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons: Death or serious injury may occur.
- Always keep the largest area of the material being cut behind the knife. If the larger area is in front of the knife, it could fly up and serious injury may occur.

Step 1. Install a new cutting stick. Then make a cut without paper, noting knife cut mark in cutting stick. Then load cutter with a stack of map stock approximately 100 mm (2-1/2 in.) in height. Make a cut checking the reason for the overcut.

(a) If cutting stick receives a second line in front of first marking, replace the knife (paragraph 5-16.13).

(b) If there is no second mark on stick, proceed to step 2.

Step 2. Check that backgauge is square to knife carrier.

(a) If backgauge is out of square, adjust backgauge (paragraph 5-16.25).

(b) If malfunction persists, refer to direct/general support maintenance.

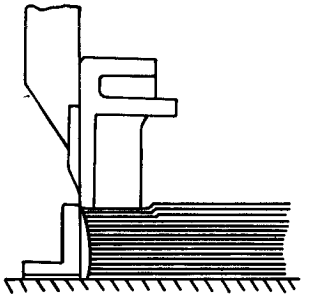
Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

4. UNDERCUT DURING THE CUT.

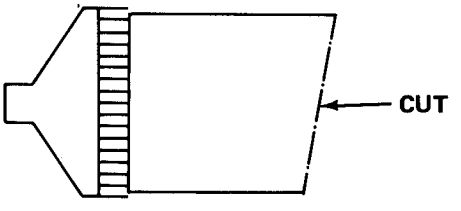


Check for dull or burred knife edge.

(a) If dull or burred, replace knife (paragraph 5-16.13).

(b) If malfunction persists, refer to malfunction 3, step 2.

5. SLANTING CUT.



Step 1. Check that backgauge is parallel to knife.

(a) If backgauge is not parallel to knife, adjust backgauge (paragraph 5-16.22).

(b) If backgauge is parallel, proceed to step 2.

Step 2. Check sledge guiding for play.

(a) If sledge guiding is loose, adjust as necessary (paragraph 5-16.23).

(b) If malfunction persists, refer to direct/general support maintenance.

Table 58. ORGANIZATIONAL TROUBLESHOOTING - Cont

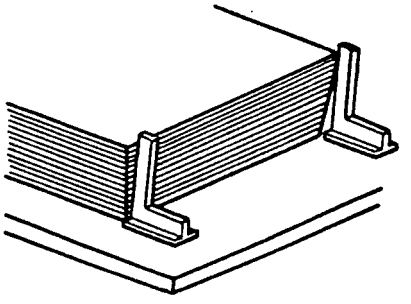
MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
6. ROUGH AND FUSED TOGETHER CUTS. Check to see if knife is blunt.	(a) If knife is blunt, replace knife (paragraph 5-16.13). (b) If malfunction persists, refer to direct/general support maintenance.
7. WARPED CUTS.  Check knife for burrs and knife position in carrier.	(a) If knife has burrs, replace knife (paragraph 5-16.13). (b) If knife is not properly positioned in knife carrier, reposition knife (paragraph 5-16.13).
8. NOTCHED CUTS . Check knife for chips and/or nicks.	(a) If knife is chipped or nicked, replace knife (paragraph 5-16.13). (b) If malfunction persists, refer to direct/general support maintenance.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

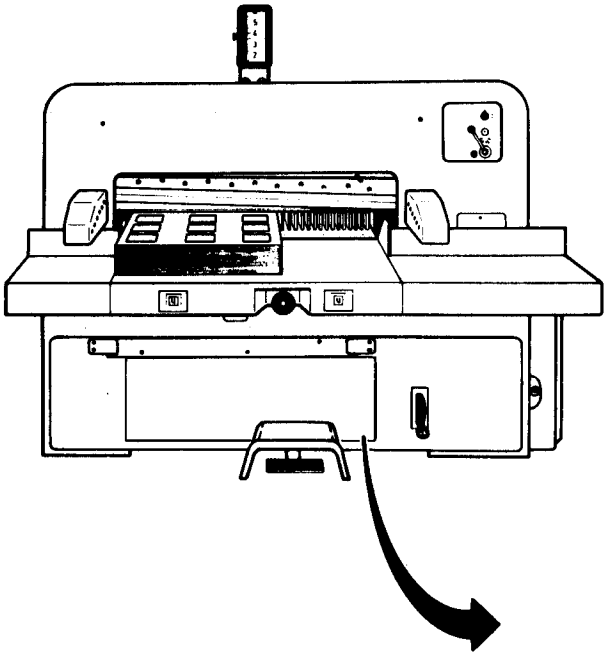
9. CLAMP DOES NOT DESCEND COMPLETELY WHEN USING FOOT PEDAL.

Step 1. Check for loose foot pedal.

(a) If loose, retighten foot pedal (paragraph 5-16.10).

(b) If not, proceed to step 2.

Step 2. Check adjustment of foot pedal cam.



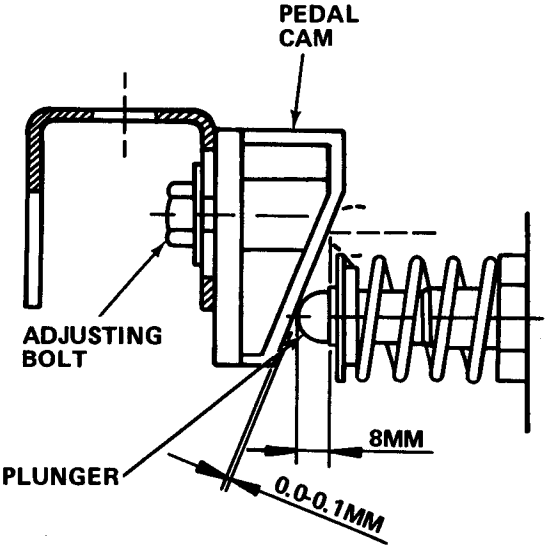


Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
9. CLAMP DOES NOT DESCEND COMPLETELY WHEN USING FOOT PEDAL - Cont
(a) If out of adjustment, perform foot pedal adjustments (paragraph 5-16.12 step h).
(b) If problem persists, proceed to step 3.
Step 3. Check return spring for proper tension.
(a) If spring tension is improper, perform return spring adjustments (paragraph 5-16.11, step m).
(b) If malfunction persists, refer to direct/general support maintenance.
10. CLAMP MOVES DOWN TOO SLOWLY DURING CUTTING CYCLE.
Check for loose or leaky connections in the hydraulic system.
(a) If loose or leaky, retighten connections.
(b) If malfunction persists, refer to direct/general support maintenance.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

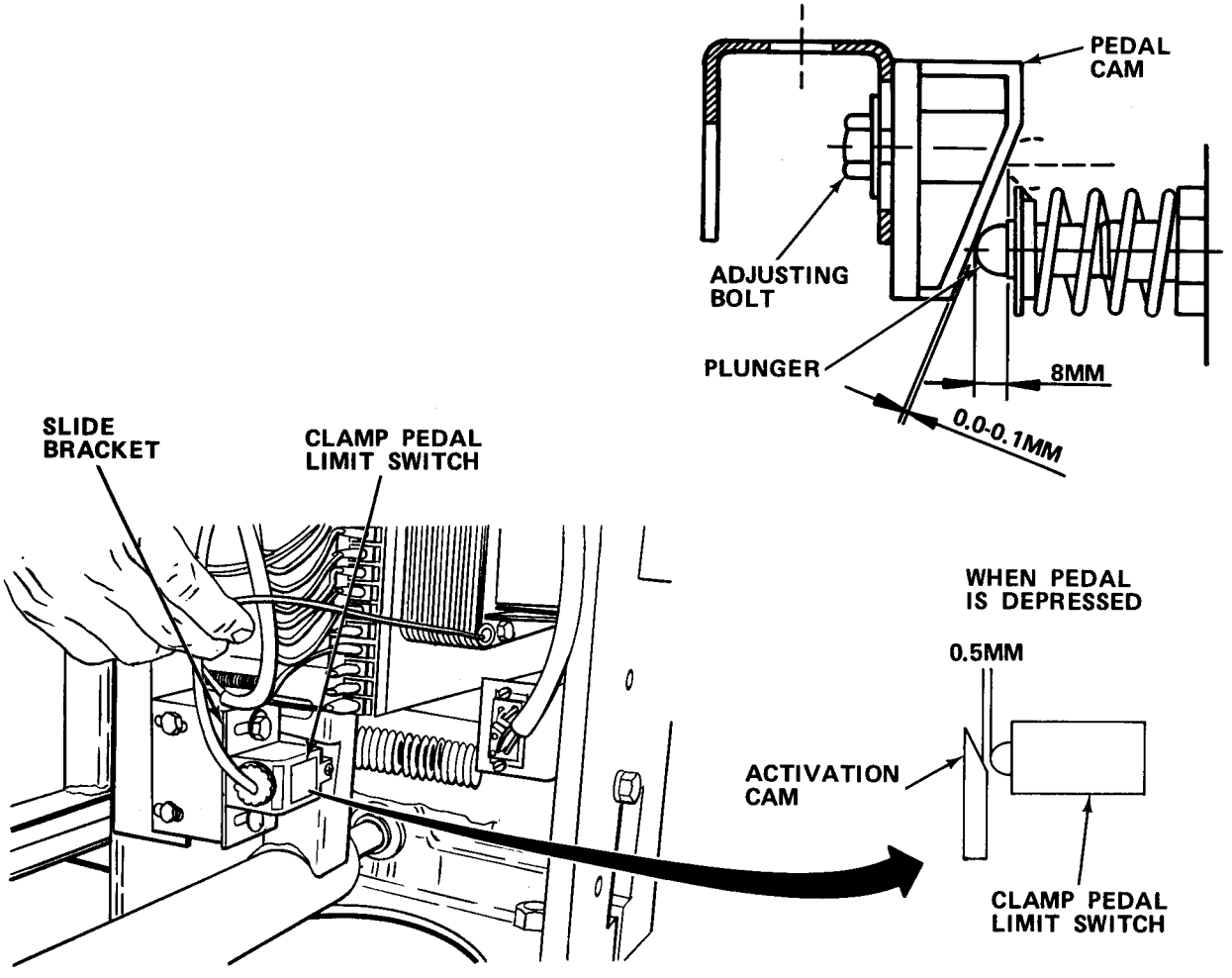
MALFUNCTION / TEST OR INSPECTION / CORRECTIVE ACTION

11. ROUGH FOOT PEDAL MOVEMENT.

Step 1. Check foot pedal cams for wear or looseness.

(a) If loose, adjust foot pedal cams (paragraph 5-16.12).

(b) If worn, replace foot pedal cams as follows:



(1) Remove front electronics enclosure cover.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

11. ROUGH FOOT PEDAL MOVEMENT - Cont

(2) Remove screws and defective cam.

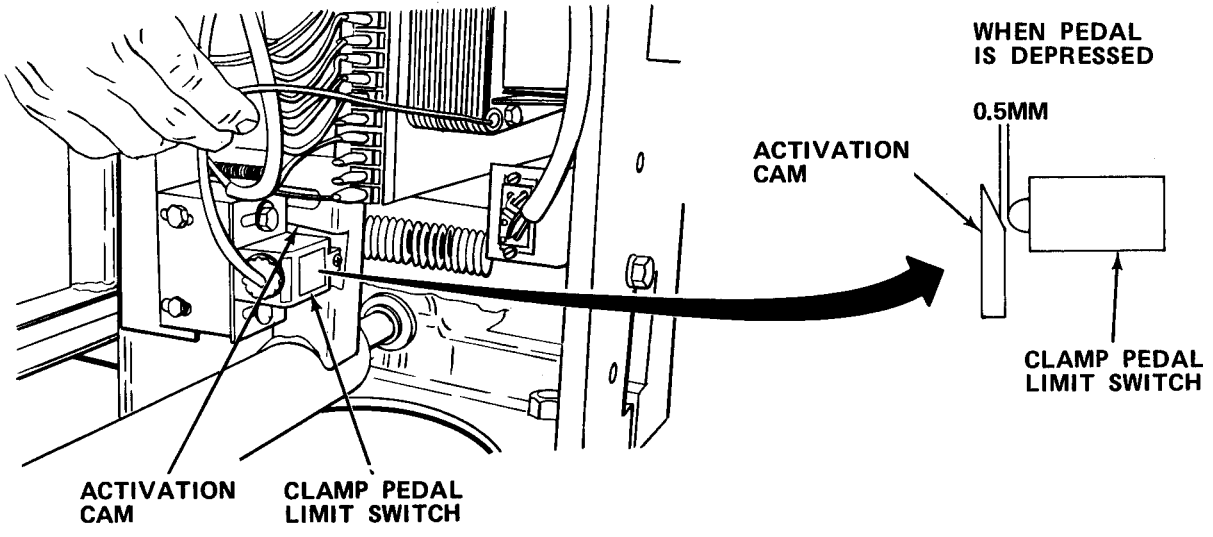
(3) Install new cam and secure with screws.

(4) Peform clamp foot pedal adjustments (paragraph 5-16.12).

(c) If malfunction persists, refer to direct/general support maintenance.

12. CLAMP DOES NOT DESCEND.

Check clamp foot pedal switch adjustment.



(a) If out of adjustment, adjust clamp foot pedal switch (paragraph 5-16.12).

(b) If malfunction persists, refer to direct/general support maintenance.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

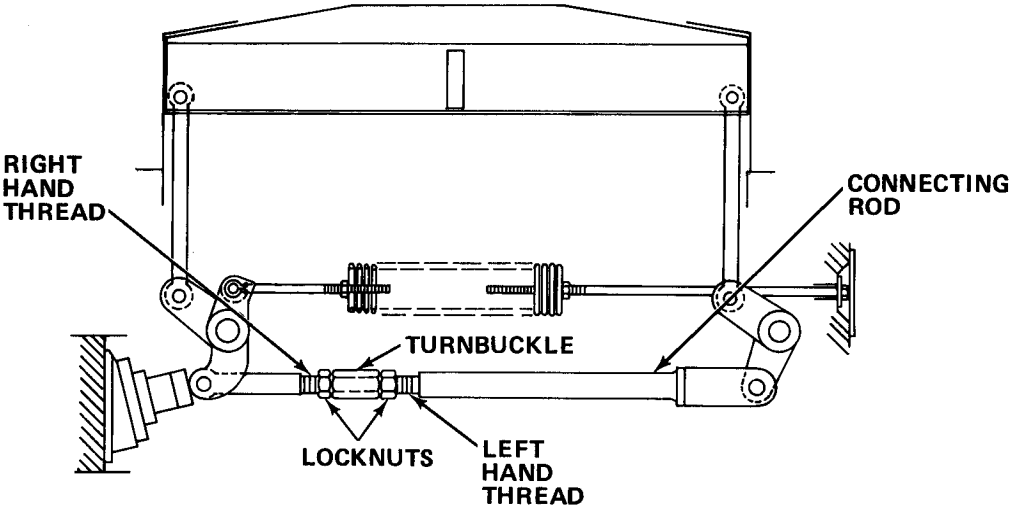
13. CLAMP IS RETURNING TOO SLOWLY OR NOT AT ALL.

Check clamp return spring tension.

(a) If tension is out of adjustment, adjust clamp return spring (paragraph 5-16.11). Be sure not to induce malfunction 9.

(b) If adjustment does not correct problem or return spring is broken, replace clamp return spring (paragraph 5-16.11).

14. CLAMP HESITATES BEFORE GOING DOWN.



Step 1. Check for loose nut on linkage adjustment turnbuckle.

(a) If nut is loose, tighten locknut.

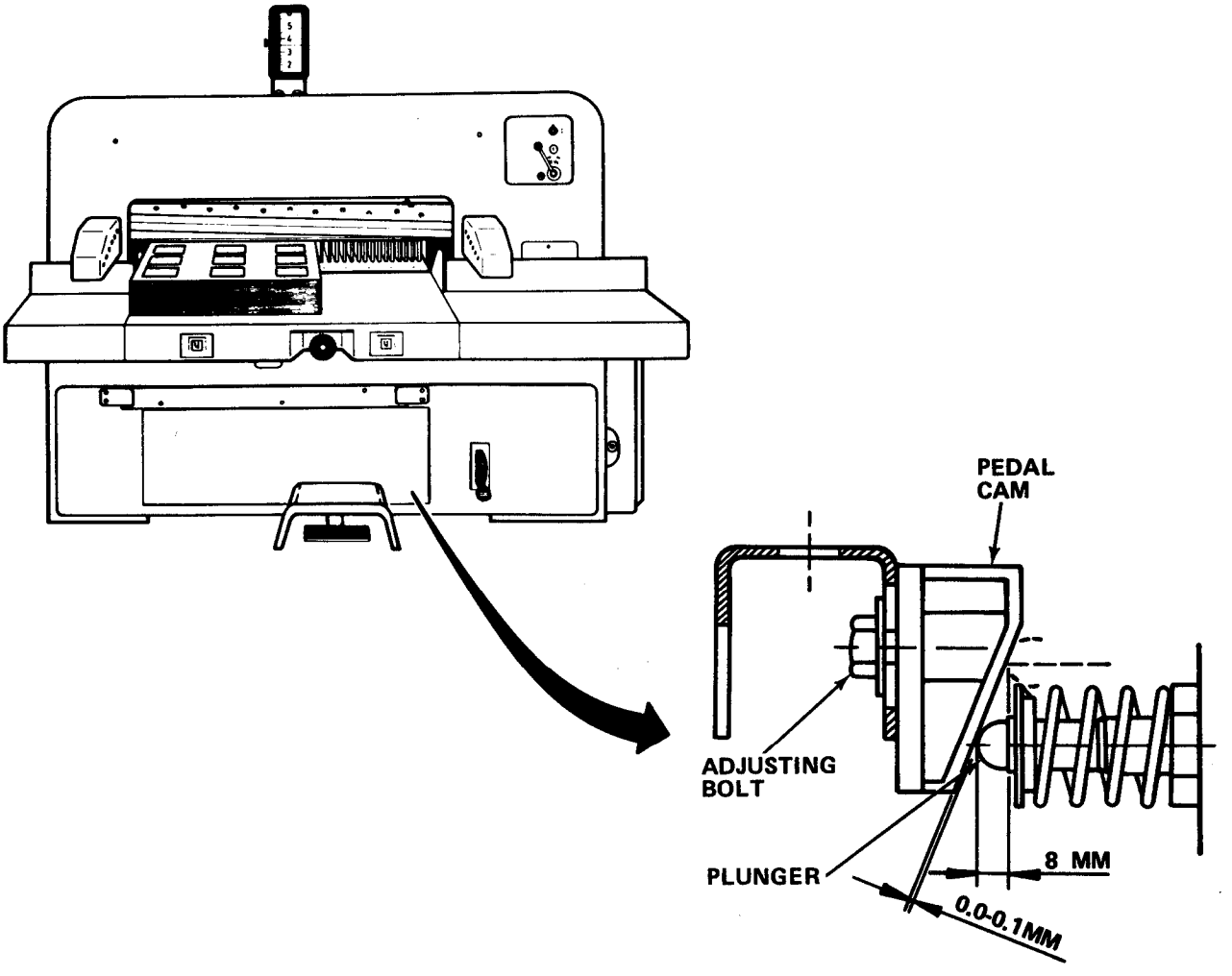
(b) If nut is not loose, proceed to step 2.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

14. CLAMP HESITATES BEFORE GOING DOWN - Cont

Step 2. Check adjustment of foot pedal cam.



(a) If out of adjustment, adjust foot pedal cam (paragraph 5-16.12).

(b) If malfunction persists, refer to direct/general support maintenance.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

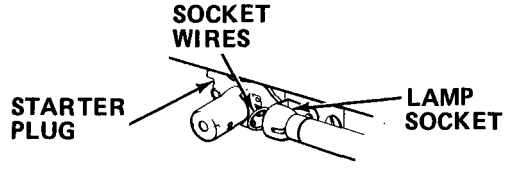
CORRECTIVE ACTION

15. FLUORESCENT TABLE LAMP DOES NOT COME ON.

WARNING

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

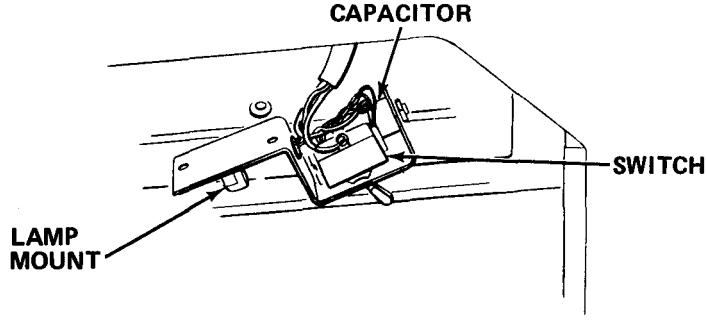
Step 1. Check that wires have not come loose at sockets of fluorescent lamp or starter.



(a) If wires are loose or broken, reconnect wires.

(b) If wiring is correct, proceed to step 2.

Step 2. Check for loose or broken wires to terminals of lamp switch.



(a) If loose or broken, reconnect wires to terminals.

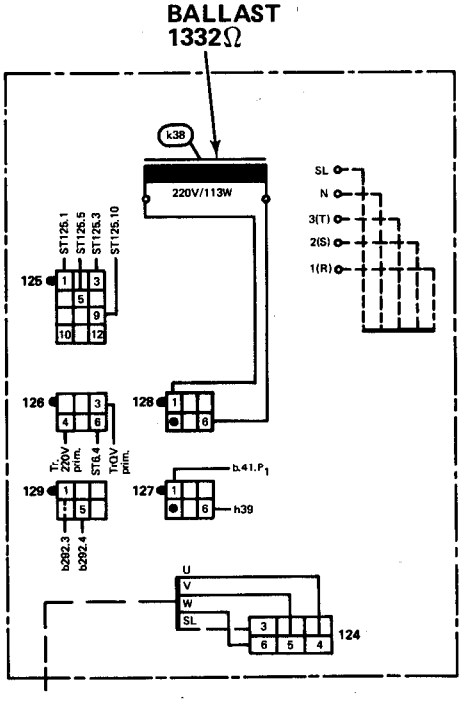
(b) If wiring is correct, proceed to step 3.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

15. FLUORESCENT TABLE LAMP DOES NOT COME ON - Cont

Step 3. Check for continuity through ballast using a multimeter.



(a) If continuity is not present, replace ballast (paragraph 5-16.21).

(b) If continuity is present, proceed to step 4.

Step 4. Check fluorescent lamp switch for continuity.

(a) If continuity is not present, replace switch (paragraph 5-16.21).

(b) If continuity is present, proceed to step 5.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
15. FLUORESCENT TABLE LAMP DOES NOT COME ON - Cont	
Step 5. Check capacitor for shorts.	(a) If defective, replace capacitor (paragraph 5-16.21). (b) If malfunction persists, refer to electrical schematic and troubleshoot.
16. ONLY ONE OCL LAMP COMES ON.	

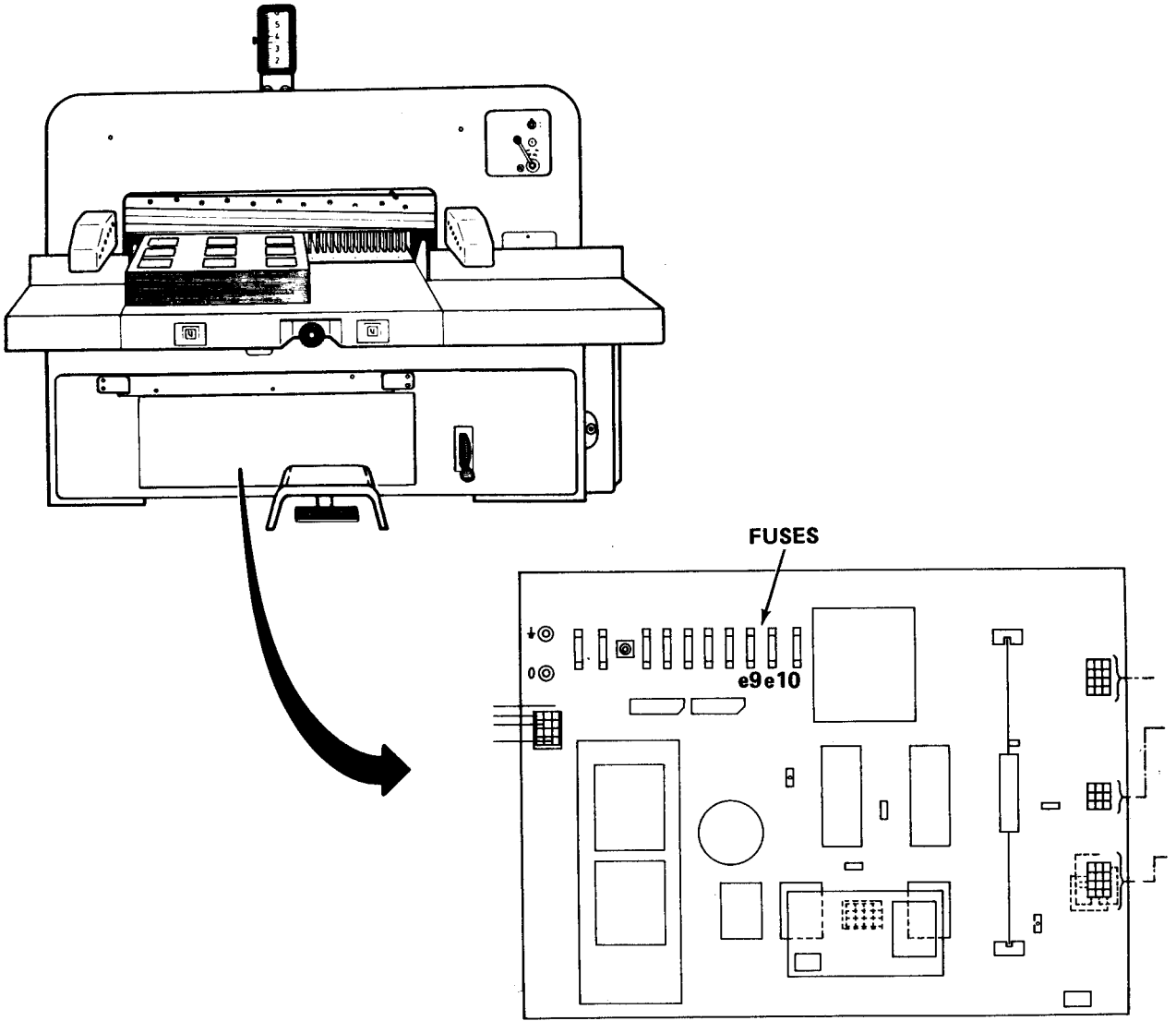
WARNING

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

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION

16. ONLY ONE OCL LAMP COMES ON - Cont



Step 1. Check fuse e9 or e10 for continuity.

(a) If fuse is open, replace defective fuse.

(b) If malfunction persists, refer to electrical schematic and troubleshoot.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

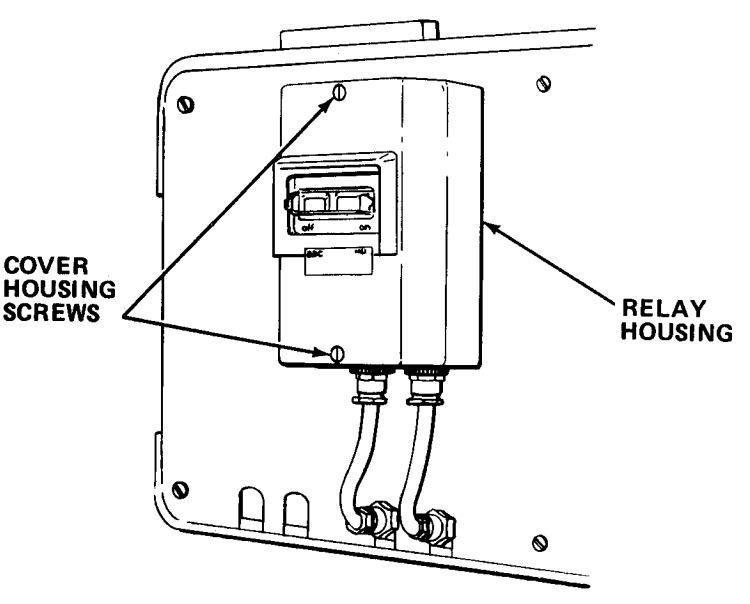
17. BACKGAUGE DOES NOT OPERATE ELECTRICALLY.

Step 1. Remove backgauge V-belt cover and check for motor operation.

(a) If motor operates, adjust or replace V-belts (paragraph 5-16.6).

(b) If motor does not operate, proceed to step 2.

Step 2. Check to see that backgauge motor overload relay is on (I), and not tripped.



(a) Reset overload relay. If relay trips again, proceed to step 5.

(b) If relay does not trip again and backgauge is still inoperable, proceed to step 3.

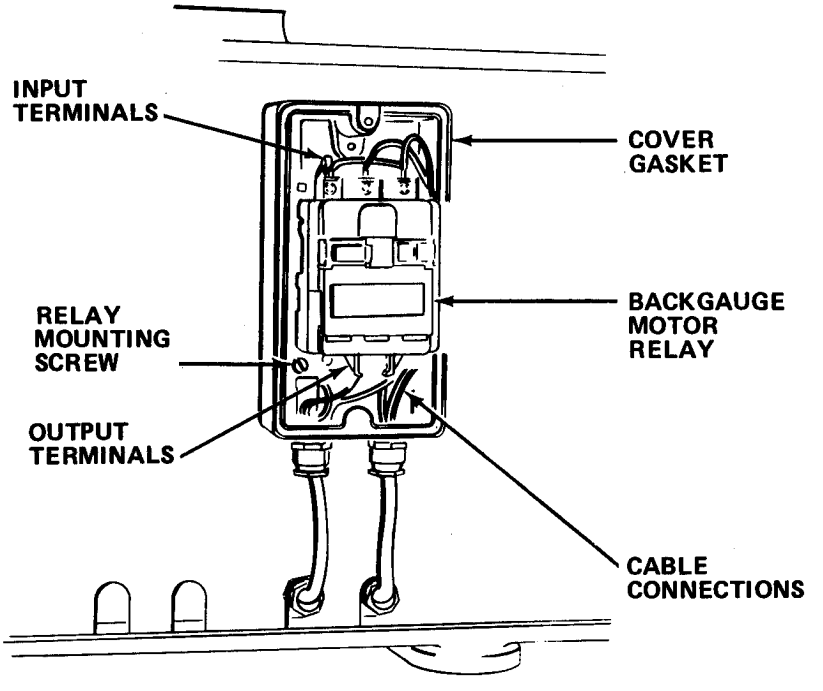
Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

17. BACKGAUGE DOES NOT OPERATE ELECTRICALLY - Cont

Step 3. Check output of backgauge overload relay.

(a) Turn main power switch to O position.



(b) Remove backgauge overload relay cover.

(c) Turn main power switch to I position.

(d) Press control power on switch.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

17. BACKGAUGE DOES NOT OPERATE ELECTRICALLY - Cont

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

(e) Check for 120 ± 5 V ac at output of three contacts on overload relay while using backgauge controls.

(1) If voltage is present, proceed to step 5.

(2) If voltage is not present, proceed to step 4.

Step 4. Check for 120 ± 5 V ac at input of three contacts on overload relay while using backgauge controls.

(a) If voltage is present, replace overload relay (paragraph 5-16.8).

(b) If voltage is not present, refer to direct/general support maintenance.

Step 5. Check resistance on backgauge motor windings.

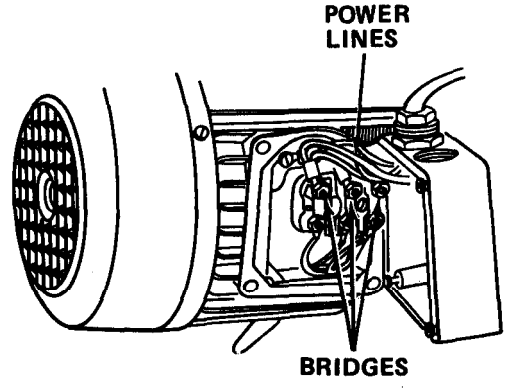


Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

17. BACKGAUGE DOES NOT OPERATE ELECTRICALLY - Cont

NOTE

Remove terminal cover from motor and disconnect power line and bridges from backgauge motor terminal block. Take ohmmeter readings across terminals according to chart below, and be sure that all three readings are in range indicated.

THREE-PHASE MOTOR TESTS

Test Lines at Terminals	Correct Ohmmeter Readings
U and X	3-5 ohms
V and Y	3-5 ohms
W and Z	3-5 ohms

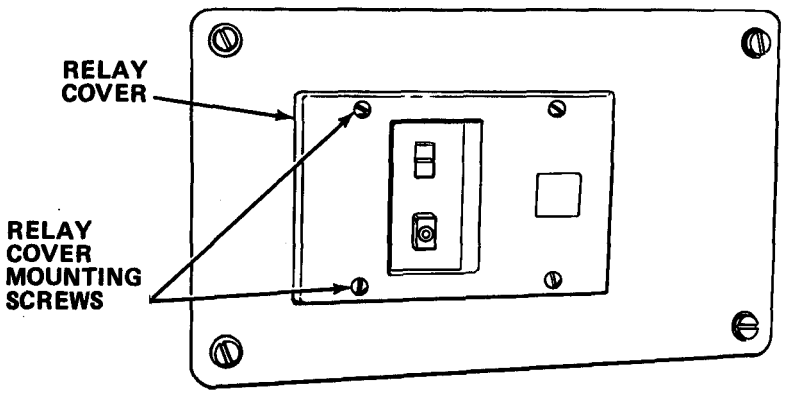
(a) If readings are incorrect, replace backgauge motor (paragraph 5-16.7).

(b) If readings are correct, refer to direct/general support maintenance.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

18. MAIN MOTOR WILL NOT START.



Step 1. Check to see that main motor overload relay is on (-), and not tripped.

(a) If main motor overload relay is not tripped, proceed to step 2.

(b) If tripped, reset overload relay. If relay trips again, proceed to step 4.

(c) If relay does not trip again and main drive motor is still inoperable, proceed to step 2.

Step 2. Check for power to main motor overload relay.

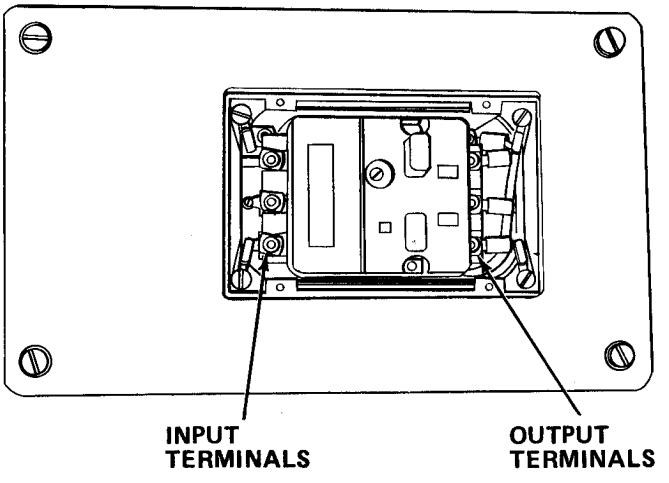
(a) Turn main power switch to 0 position.

(b) Remove main drive motor overload relay cover.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

18. MAIN MOTOR WILL NOT START - Cont



(c) Turn main power switch to I position.

(d) Check for 120 ± 5 V ac at input of three contacts on overload relay.

(1) If voltage is correct, proceed to step 3.

(2) If voltage is not present, replace main power switch (paragraph 5-16.15).

Step 3. Check for 120 ± 5 V ac at output of three contacts on overload relay.

(a) If voltage is not present, replace overload relay (paragraph 5-16.3).

(b) If voltage is correct, proceed to step 4.

Step 4. Check resistance on main motor windings.

NOTE

Remove cover and disconnect power line and bridges from main drive motor terminal block. Take ohmmeter readings across terminals according to chart below, and be sure that all three readings are in range indicated below.

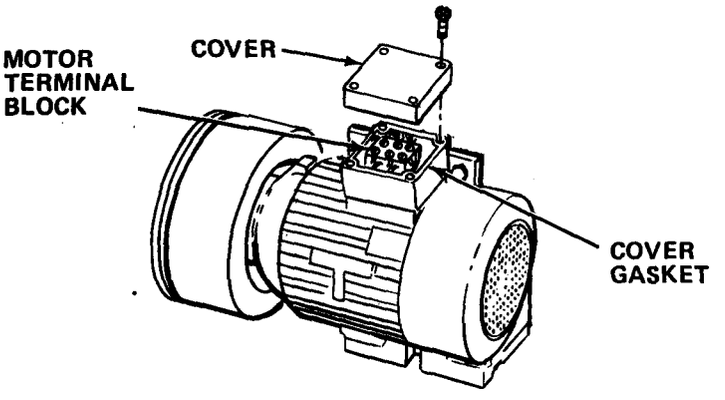
Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

18. MAIN MOTOR WILL NOT START - Cont



THREE-PHASE MOTOR TESTS

Test Lines at Terminals	Correct Ohmmeter Readings
U and X	3-5 ohms
V and Y	3-5 ohms
W and Z	3-5 ohms

(b) If readings are incorrect, replace main drive motor (paragraph 5-16.5).

(c) If correct, replace cabling between overload relay and main drive motor.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

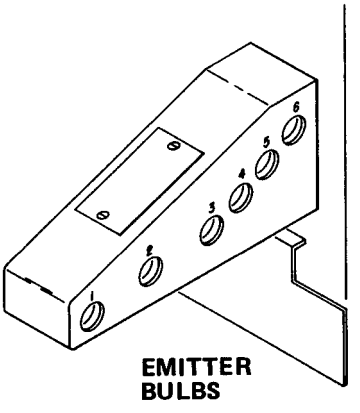
MALFUNCTION / TEST OR INSPECTION	CORRECTIVE ACTION
19. BACKGAUGE DOES NOT TRAVEL ALL THE WAY FORWARD OR BACKWARD.	
Step 1. Be sure that backgauge sledge cams and limit switches are positioned correctly and are not loose.	
	(a) If switches are out of adjustment, adjust backgauge limit switches (paragraph 5-16.24).
	(b) If switches are adjusted correctly, proceed to step 2.
Step 2. Check sledge guiding for proper adjustment.	
	(a) If out of adjustment, adjust sledge guiding (paragraph 5-16.23).
	(b) If malfunction persists, refer to direct/general support maintenance.
20. PAPER CUTTER IS ON. MAIN MOTOR IS ON. LIGHT BARRIER SIGNAL LAMP IS OFF.	
Step 1. Inspect emitter bulbs.	
 EMITTER BULBS	
	(a) If a bulb is burned out, replace bulb (paragraph 5-16.19, step g).
	(b) If one or more bulbs are dim or incorrectly aimed, adjust light barrier focus (paragraph 5-16.19, step i).
	(c) If all bulbs are bright, proceed to step 2.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
20. PAPER CUTTER IS ON. MAIN MOTOR IS ON. LIGHT BARRIER SIGNAL LAMP IS OFF Cont		(d) If bulbs 1, 3, and 5 are inoperative replace fuse e6.

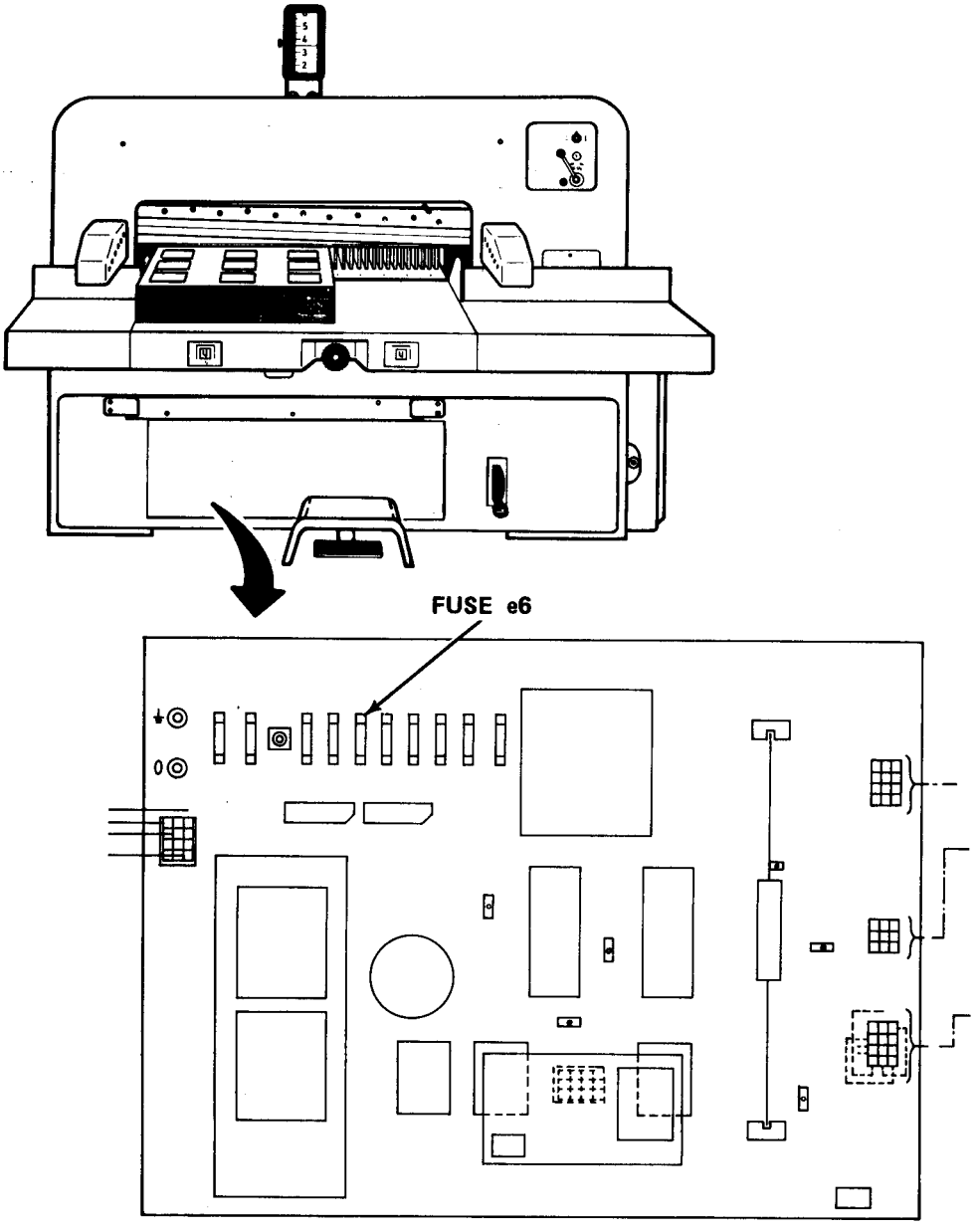


Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

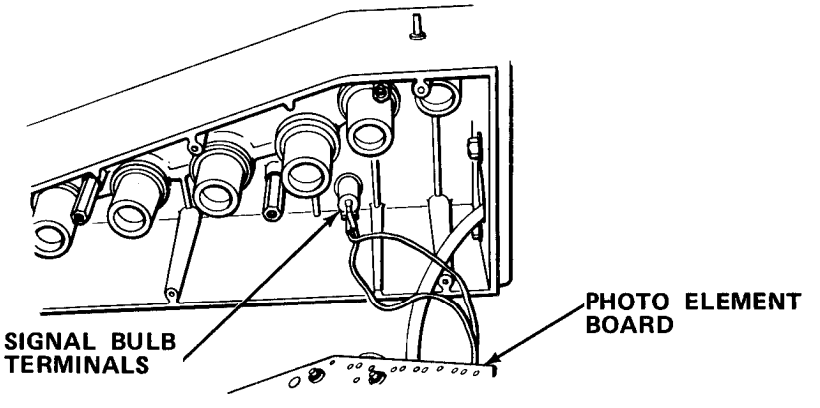
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

20. PAPER CUTTER IS ON. MAIN MOTOR IS ON. LIGHT BARRIER SIGNAL LAMP IS OFF - Cont

(e) If bulbs 2, 4, and 6 do not operate, proceed to step 3.

(f) If all bulbs do not operate, refer to direct/general support maintenance for replacement of control transformer (paragraph 5-20.9);

Step 2. Remove right light barrier cover. Pull out photo element plate and check continuity of signal lamp bulb.



(a) If signal lamp bulb is defective, replace it by:

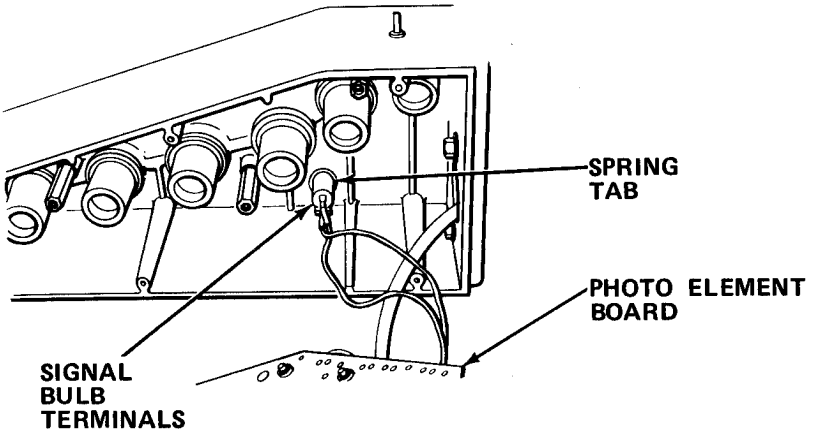


Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

20. PAPER CUTTER IS ON. MAIN MOTOR IS ON. LIGHT BARRIER SIGNAL LAMP IS OFF - Cont

(1) Disconnect wiring to signal lamp.

(2) Press spring tabs and remove defective 1 amp from front of housing.

(3) Install new signal lamp.

(4) Reconnect wiring.

(b) If signal 1 amp is not defective, proceed to step 5.

Step 3. Check continuity of fuse e7.

(a) If continuity is not present, replace fuse e7.

(b) If continuity is present, proceed to step 4.

Step 4. Check for ± 24 V input to relays d230a and b at plug connector 111, pin 1. Use pin 4 as ground.

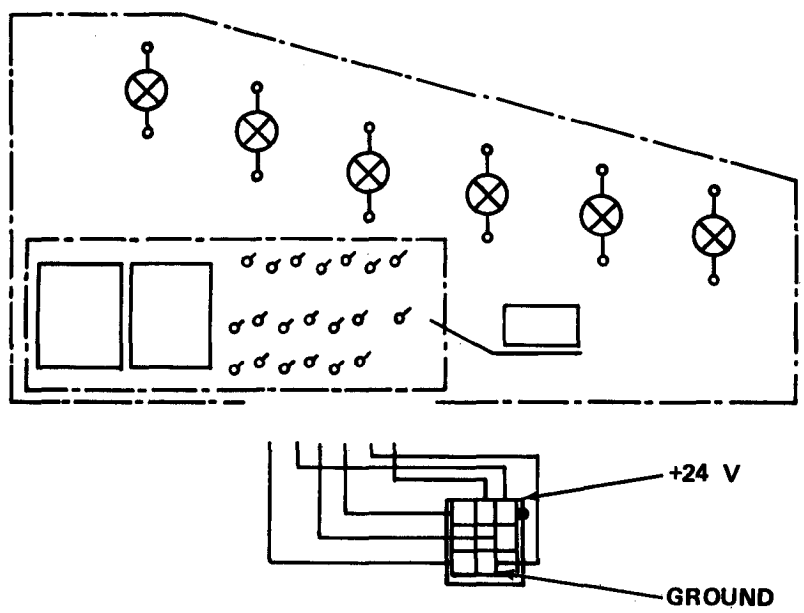


Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

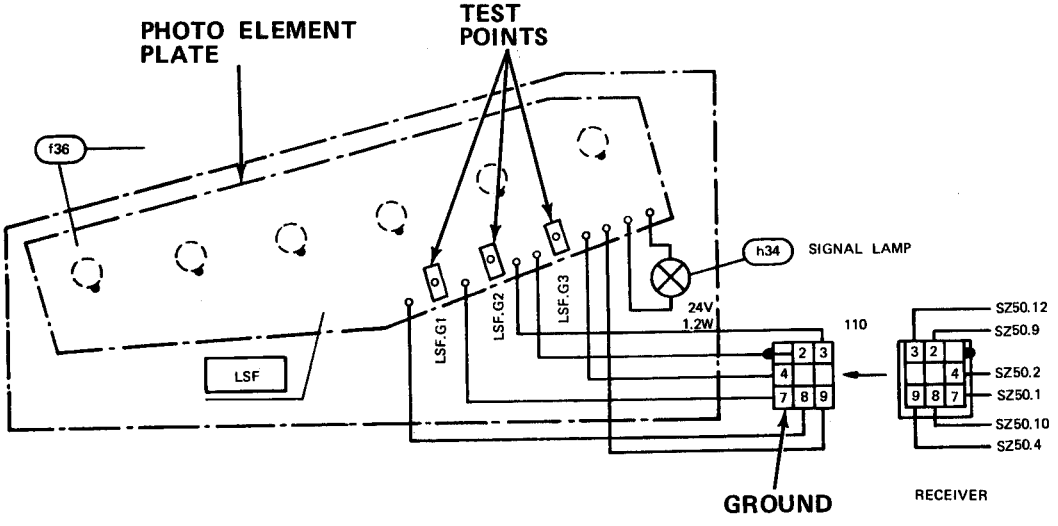
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

20. PAPER CUTTER IS ON. MAIN MOTOR IS ON. LIGHT BARRIER SIGNAL LAMP IS OFF - Cont

(a) If voltage is present, replace light barrier relay board (LSL) (paragraph 5-16.19, step f).

(b) If voltage is not present, refer to direct/general support maintenance.

Step 5. Test voltages at photo element plate yellow test points, G1, G2, and G3 using pin 7 of plug connector 110 as ground. Be sure voltage levels are a maximum of .12 V dc when light beams are uninterrupted and raise to a minimum of .5 V dc when light beams are interrupted.



(a) If voltages are incorrect, replace photo element board (LSF) (paragraph 5-16.20, step f).

(b) If voltages are correct, refer to direct/general support maintenance.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
21. LIGHT BARRIER IS OPERATIONAL. KNIFE AND CLAMP DO NOT OPERATE WHEN CUTTING BUTTONS ARE PRESSED.		

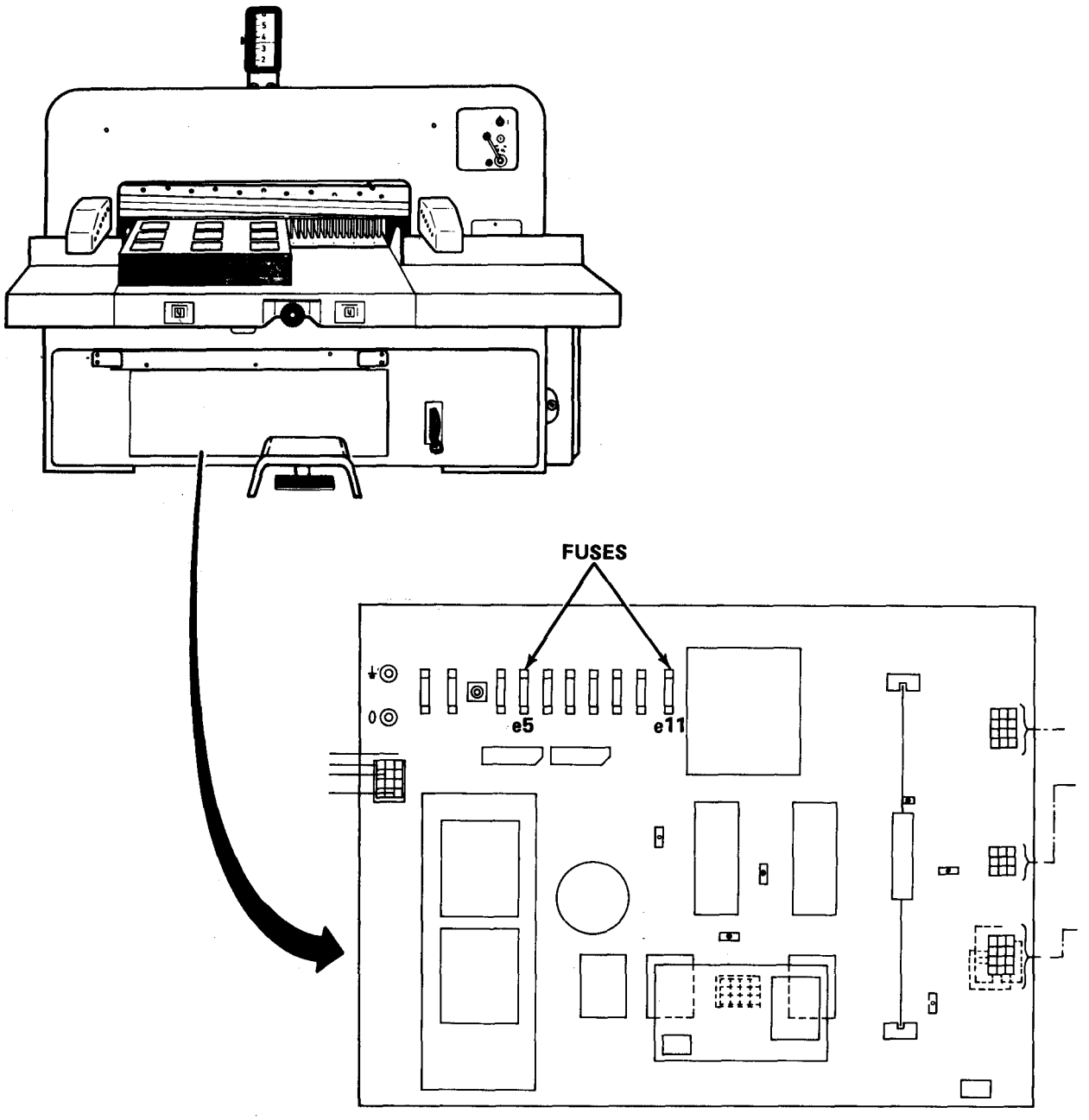


Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

21. LIGHT BARRIER IS OPERATIONAL. KNIFE AND CLAMP DO NOT OPERATE WHEN CUTTING BUTTONS ARE PRESSED - Cont

Step 1. Check continuity of fuses e5 and e11 on motherboard.

(a) If continuity is not present, replace defective fuse.

(b) If fuses are not defective, proceed to step 2.

Step 2. Test continuity of cutting buttons.

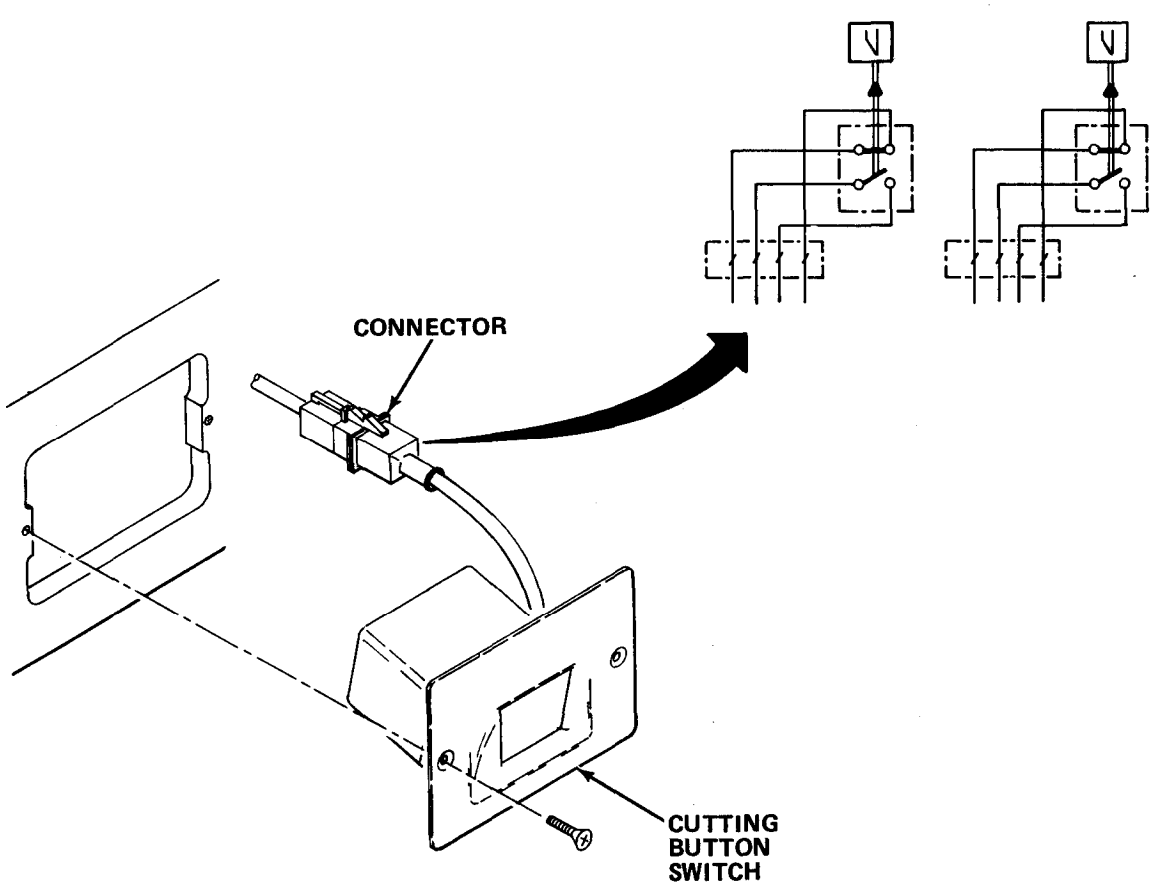


Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
21. LIGHT BARRIER IS OPERATIONAL. KNIFE AND CLAMP DO NOT OPERATE WHEN CUTTING BUTTONS ARE PRESSED - Cont	

NOTE

- With cutting buttons released, pins 1 and 2 should show continuity and pins 3 and 4 should show open.
- With cutting buttons depressed, pins 1 and 2 should show open; pins 3 and 4 should show continuity.

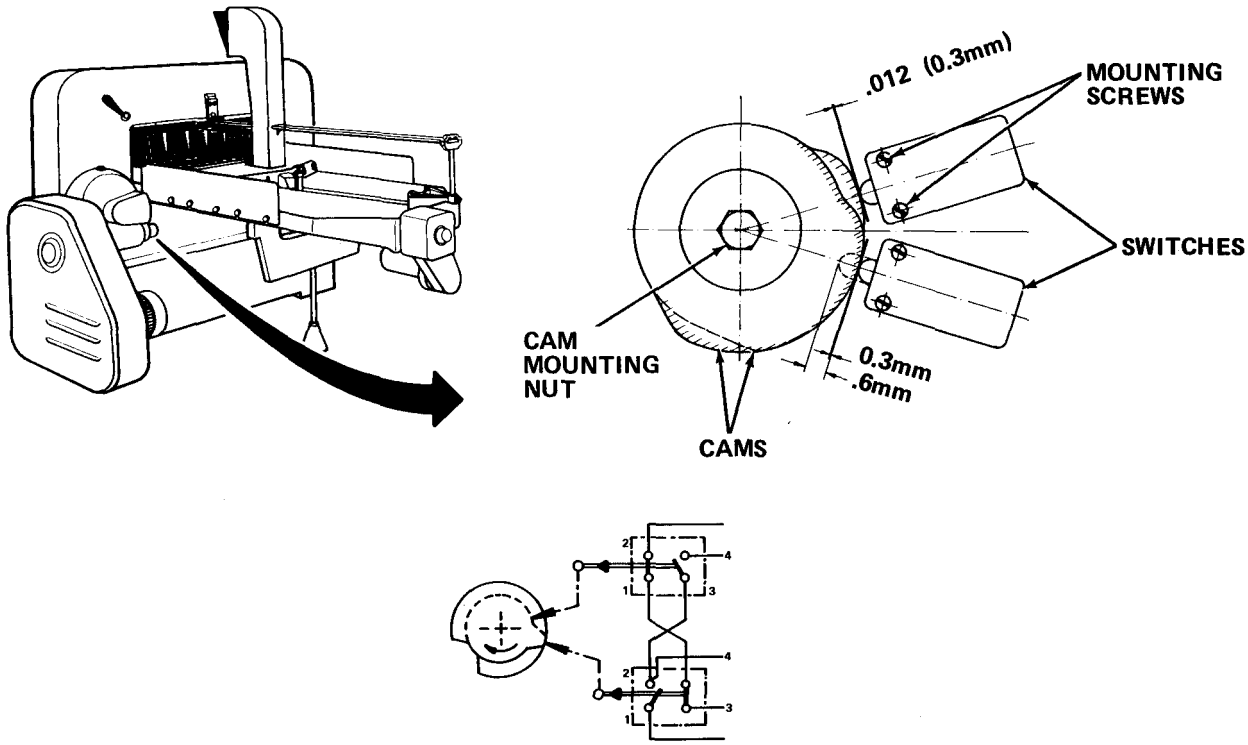
(a) If continuity checks are incorrect, replace defective cutting button(s) (paragraph 5-16.16).

(b) If continuity is correct, refer to direct/general support maintenance.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

22. LIGHT BARRIER IS OPERATIONAL. KNIFE STOPS MIDWAY UP AFTER CUT. CLAMP OPERATES.



Step 1. Check position of gear limit switch rollers on surface of cams.

(a) If cams are not positioned correctly, adjust gear limit switches (paragraph 5-16.18, step h).

(b) If adjustment is correct, proceed to step 2.

Step 2. Check continuity of gear limit switches.

(a) If continuity is incorrect, rep ace gear limit switches (paragraph 5-16.18).

(b) If continuity is correct, refer to direct/general support maintenance.

Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
23. PAPER CUTTER POWER SWITCH IS ON. MAIN MOTOR IS ON. OMI LIGHT IS INOPERATIVE.		

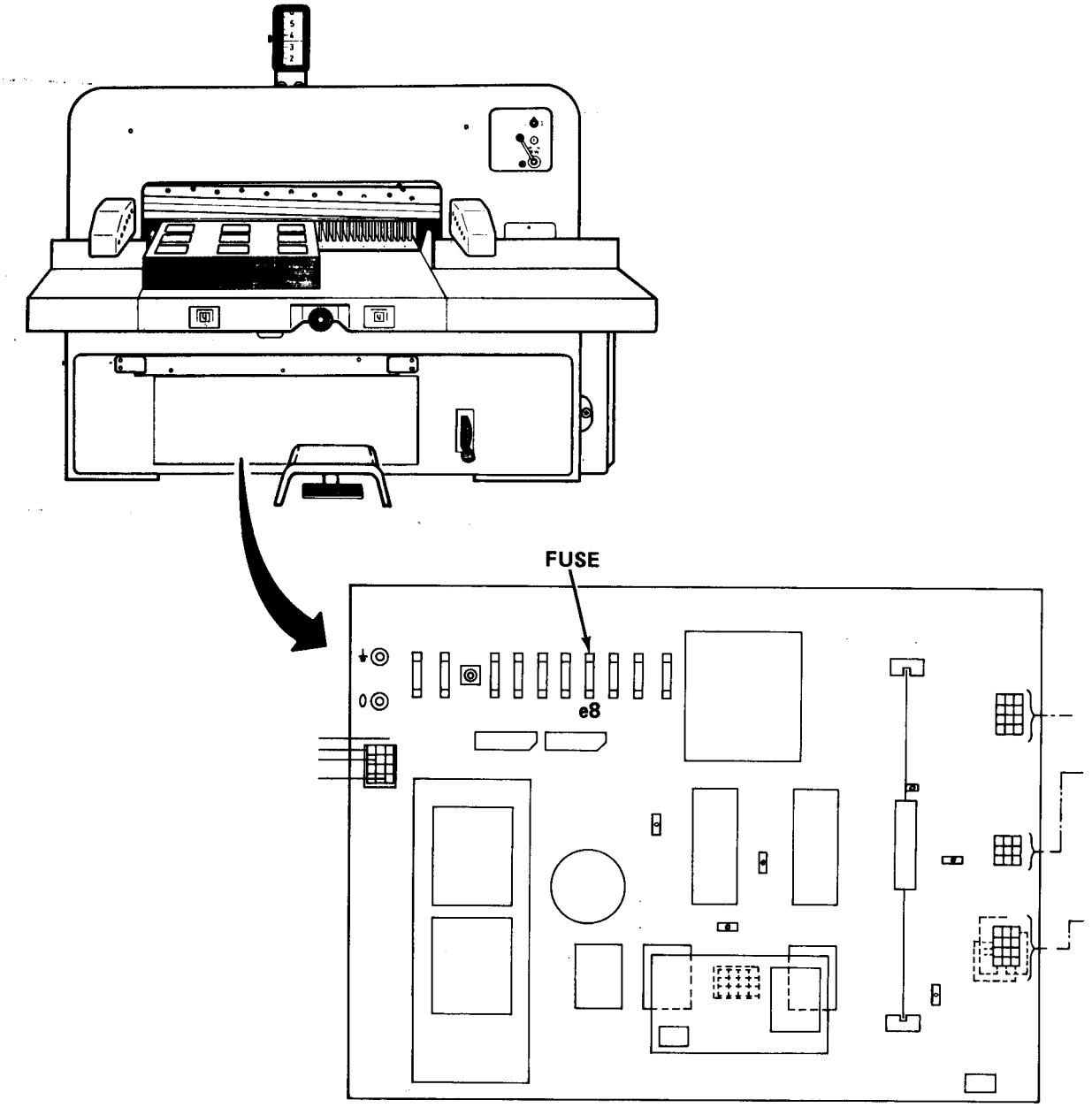


Table 5-8. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

23. PAPER CUTTER POWER SWITCH IS ON. MAIN MOTOR IS ON. OMI LIGHT IS INOPERATIVE - Cont

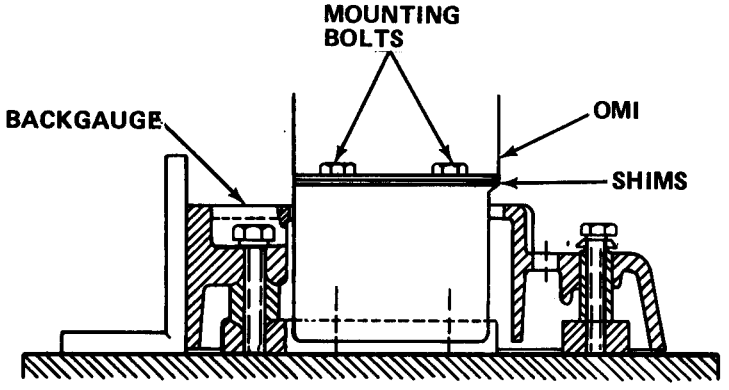
Check continuity of fuse e8 on motherboard.

(a) If continuity is not present, replace fuse e8.

(b) If continuity is present, refer to electrical schematic and troubleshoot.

24. BASIC OMI MEASUREMENT VARIES FROM CUT TO CUT.

Check OMI for loose mountings.



(a) If mountings are loose, tighten and be sure shims are in

(b) If malfunction persists, refer to direct/general support maintenance.

5-16. MAINTENANCE PROCEDURES.

a. This section contains instructions covering organizational maintenance funtions for the paper cutter. Personnel required are listed only if the task requires more than one.

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

INDEX

INDEX - Cont

5-16.1 Replace Main Drive Gear Clutch Pads.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
13 mm Combination Wrench
Metric Feeler Gages (0.4 - 0.8 mm)

SUPPLIES: Clutch Pads
Spacer Foils
Sandpaper, Medium Grit (Item 23, Appendix E)

WARNING

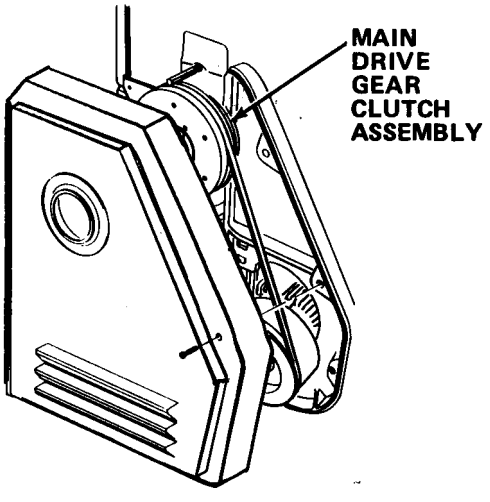
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

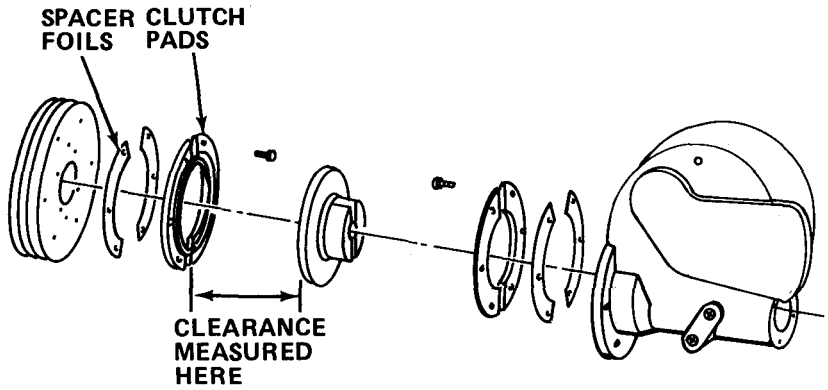
a. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove main motor V-belt cover.





c. Remove bolts and defective clutch pads and any spacer foils.

d. Install new clutch pads and secure with bolts.

e. Check for air gap clearance of 0.40 - 0.8 mm (.016 - .031 in.).

f. If clearance is less than 0.4 mm (.016 in.), remove clutch pads and sand pad surface until proper gap is obtained when reinstalled. Repeat steps d. through f. as necessary.

g. If clearance is more than 0.8 mm (.031 in.), remove clutch pads and add spacer foils until proper gap is obtained.

h. Reinstall main motor V-belt cover.

i. Place operator key back into safety lock.

5-16.2 Replace Main Drive Gear Clutch Brakes.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
Knife Reset Handles
13 mm Combination Wrench
Metric Feeler Gages (0.2 - 0.4 mm)

SUPPLIES: Clutch Brakes
Spacer Foils
Sandpaper, Medium Grit (Item 23, Appendix E)

WARNING

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

a. Turn off power.

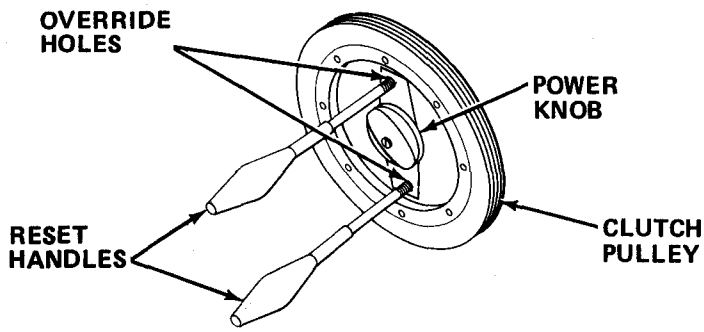
(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove main motor V-belt cover.

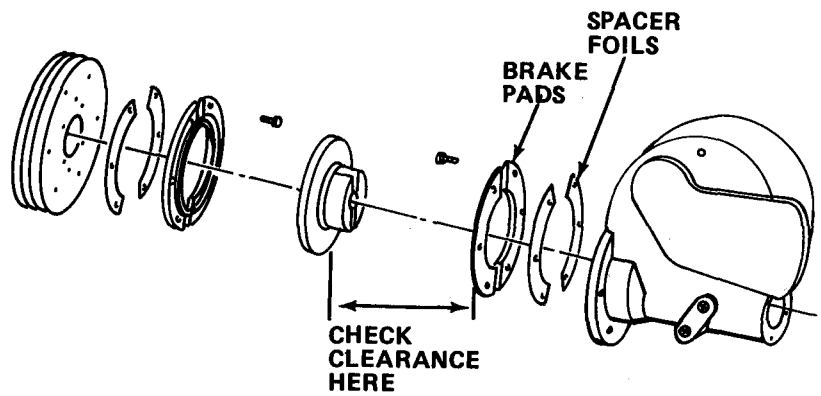
c. Remove main power switch knob.

d. Mount main power switch knob onto shaft of clutch pulley and rotate the safety plate right to open the clutch override holes.



e. Insert the reset handles into the override holes. Press the handles in while rotating the pulley until the threads engage; then tighten the handles.

f. Remove bolts and defective brake pads and any spacer foils.



g. Install new brake pads and check air gap for clearance of 0.20 - 0.40 mm (.008 - .016 in.).

h. If clearance is less than 0.2 mm (.008 in.), remove brake pads and sand pad surface until proper gap is obtained. Repeat steps g. and h. as necessary.

i. If clearance is more than 0.4 mm (.016 in.), remove brake pads and add spacer foils until proper gap is obtained.

j. Remove the reset handles.

k. Rotate the safety plate left and cover the override holes.

l. Remove main power knob and reinstall onto main power switch.

m. Reinstall main motor V-belt cover.

n. Place operator key back into safety lock.

5-16.3 Replace Main Drive Motor Overload Relay.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Offset Flat Tip Screwdriver
Flat Tip Screwdriver

SUPPLIES: Overload Relay

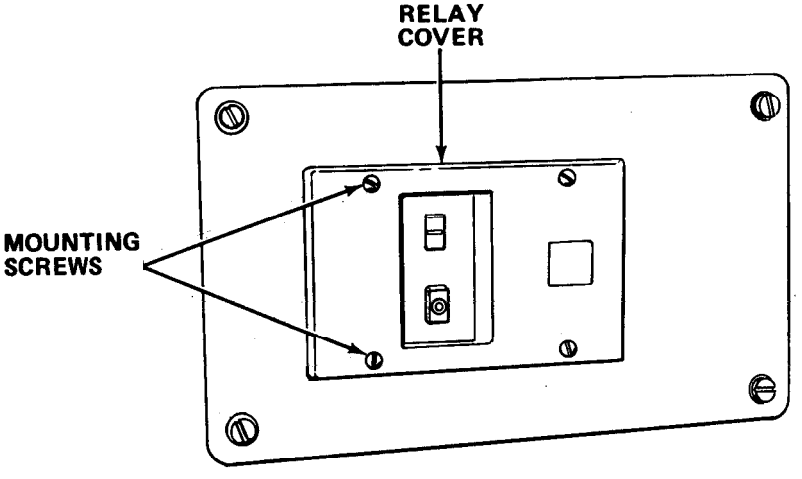
WARNING

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

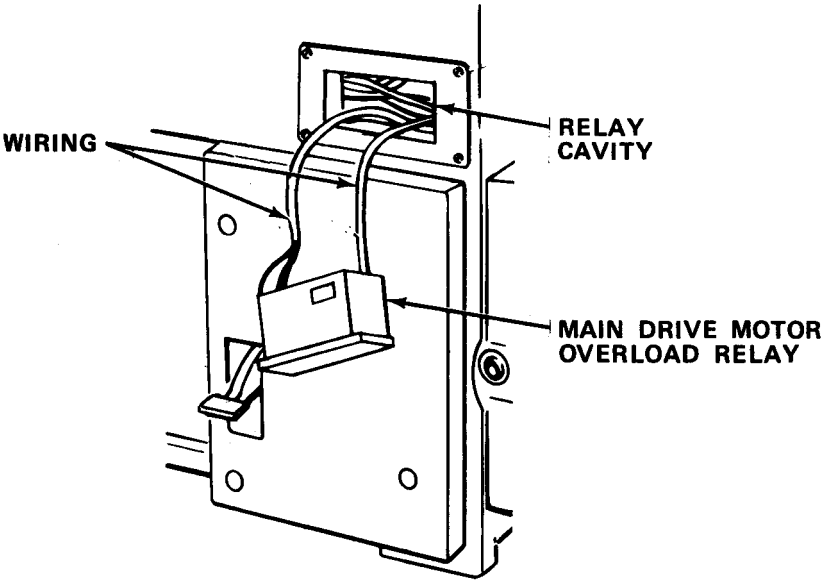
a. Turn off power.

(1) Turn main power switch to 0 position.

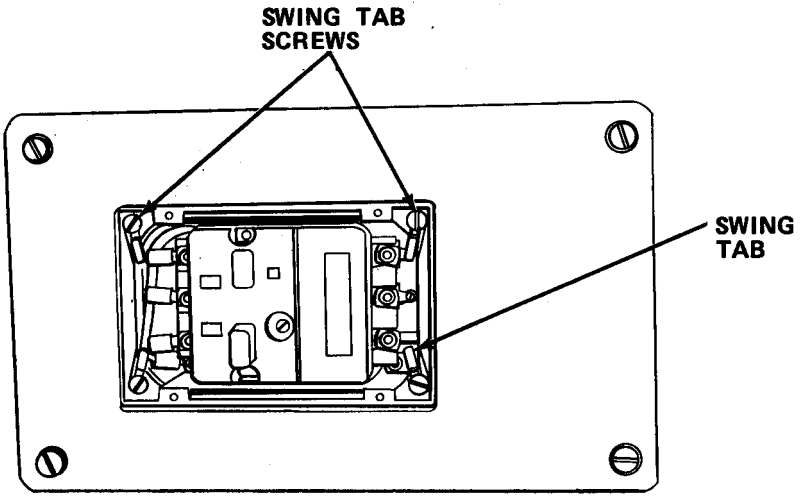
(2) Using operator key, lock safety lock and keep key in your possession.



b. Remove four screws securing mounting plate and tilt assembly to allow access to cover mounting screws.



c. Remove four screws holding relay cover in place and remove cover.



d. Loosen and remove four screws and swing tabs holding relay inner housing in place.

e. Slide relay housing from panel.

f. Tag and disconnect wiring from defective relay.

g. Reconnect wiring to new relay.

h. Insert new relay and reinstall screws. Turn swing tabs so they will press against panel when tightened.

i. Reinstall relay cover.

j. Position mounting plate and secure with screws.

k. Place operator key back into safety lock.

5-16.4 Replace Main Drive Motor V-Belts.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
19 mm Combination Wrench

SUPPLIES: V-Belts

NOTE

Always replace both V-belts when replacing either belt.

WARNING

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

a. Turn off power.

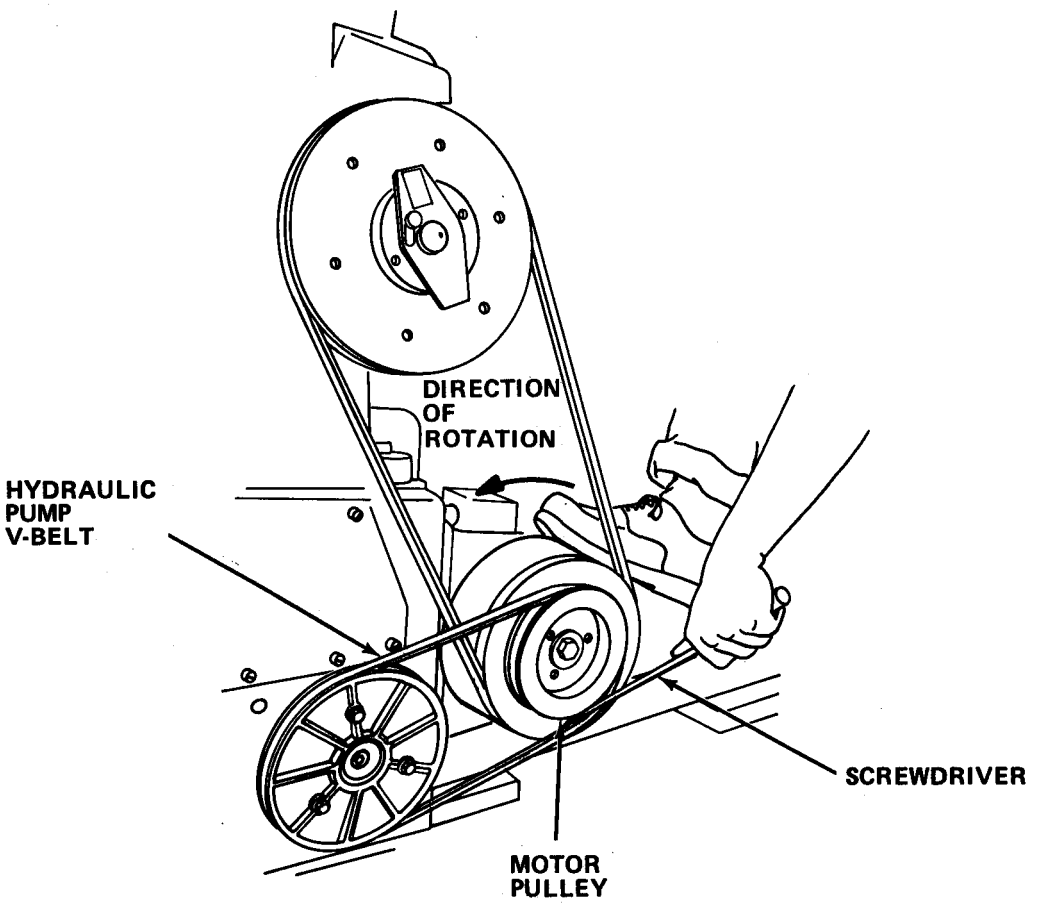
(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove main motor V-belt cover.

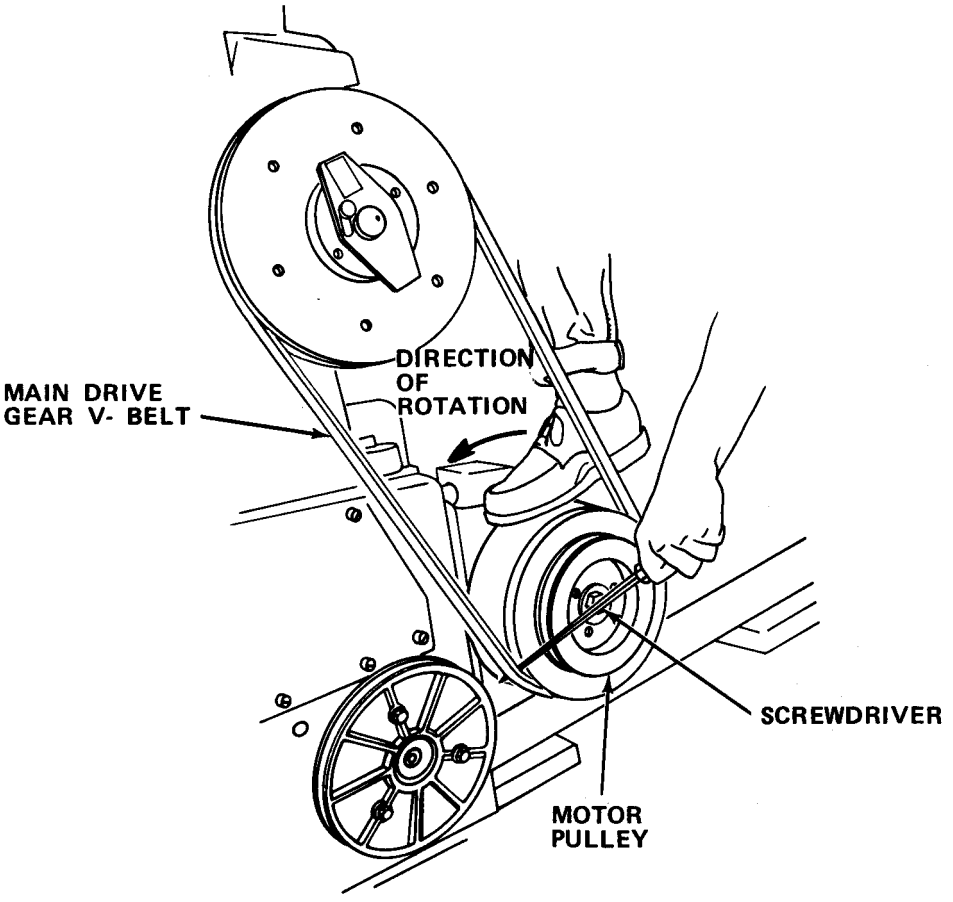
c. Remove inner V-belt cover.

d. Standing behind motor, place screwdriver under motor pulley between pulley and hydraulic pump V-belt.



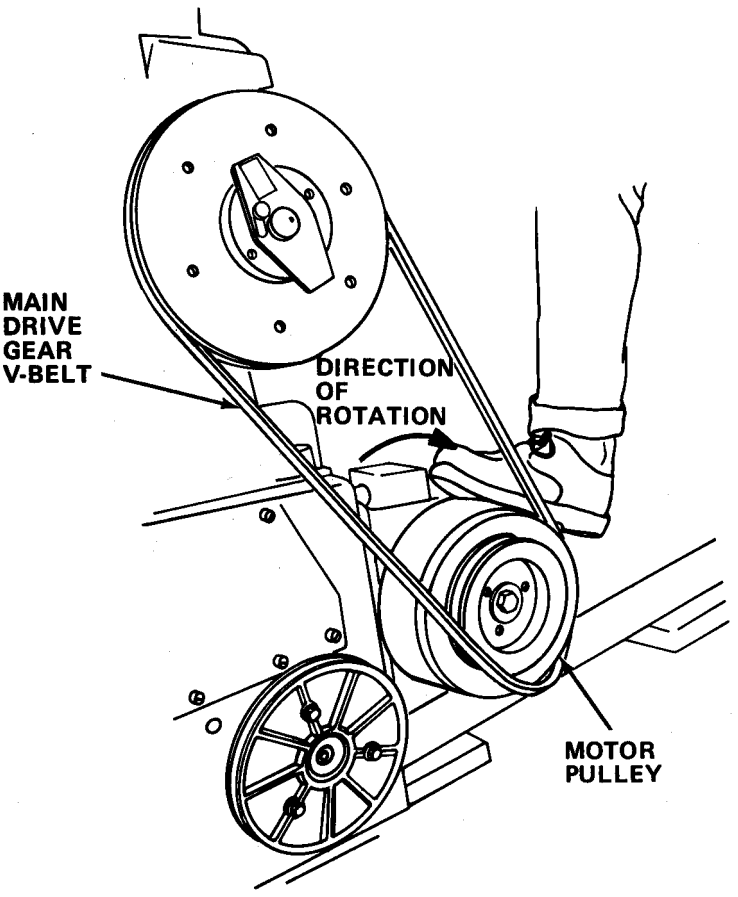
e. Place foot on top of motor pulley and rotate pulley forward until V-belt is free.

f. Place screwdriver between main drive gear V-belt and bottom of pulley.



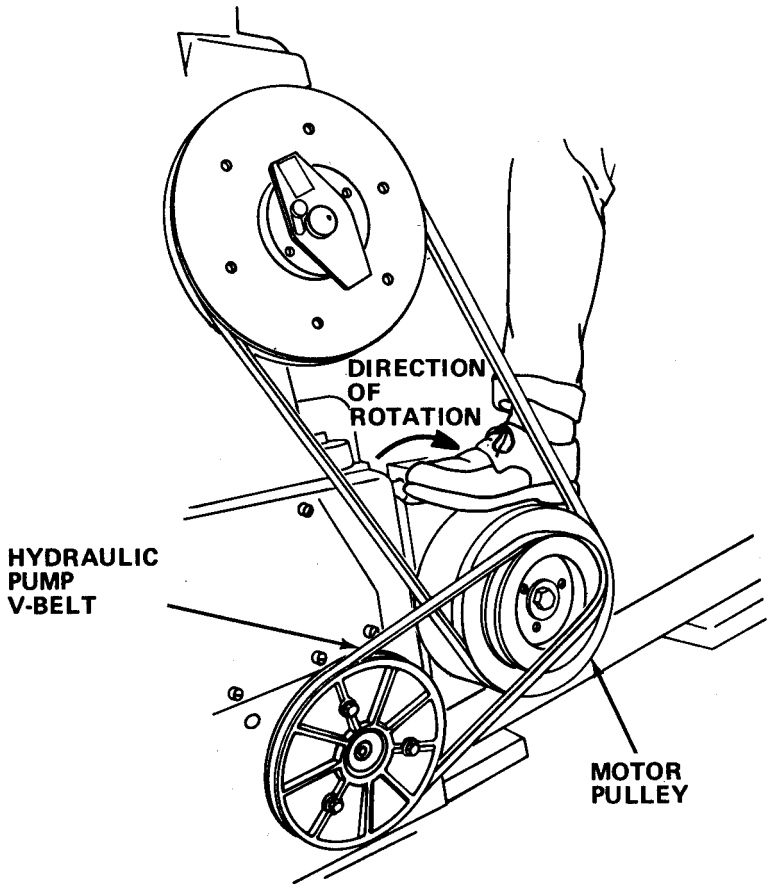
g. Place foot on top of motor pulley and rotate pulley forward until V-belt is free.

h. Place new main drive gear V-belt over clutch pulley and as far as possible over inside motor pulley.



i. Place foot on top of motor pulley and rotate back until V-belt is on pulley.

j. Place new hydraulic pump V-belt over pump pulley and as far as possible over outside motor pulley.

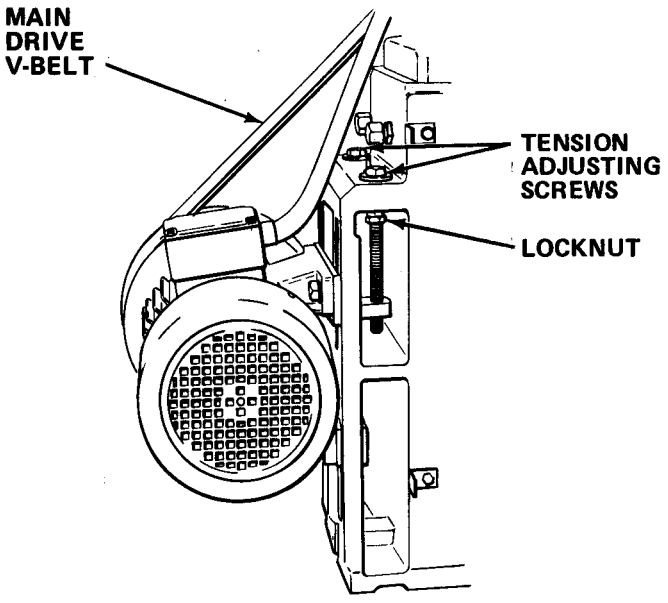


k. Place foot on top of motor pulley and rotate back until V-belt is on pulley.

l. Using modest finger pressure, press down on main gear drive V-belt and verify belt moves down only 10 mm (.39 in.).

m. If correct, proceed to step r.

n. If incorrect, adjust tension.



o. Loosen locknuts on underside of motor adjusting mount.

NOTE

Turning bolts right tightens belt.

p. Turn adjusting bolts until proper tension is obtained. Be sure to turn both bolts the same amount each time.

q. Tighten locknuts on underside of motor adjusting mount.

r. Reinstall inner V-belt cover.

s. Reinstall main drive V-belt cover.

t. Place operator key back into safety lock.

5-16.5 Replace Main Drive Motor.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
19 mm Combination Wrench
7 mm Nut Driver

SUPPLIES: Main Drive Motor

WARNING

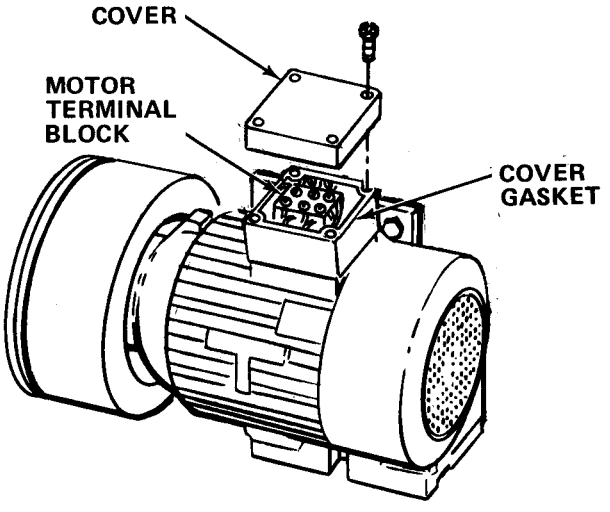
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.

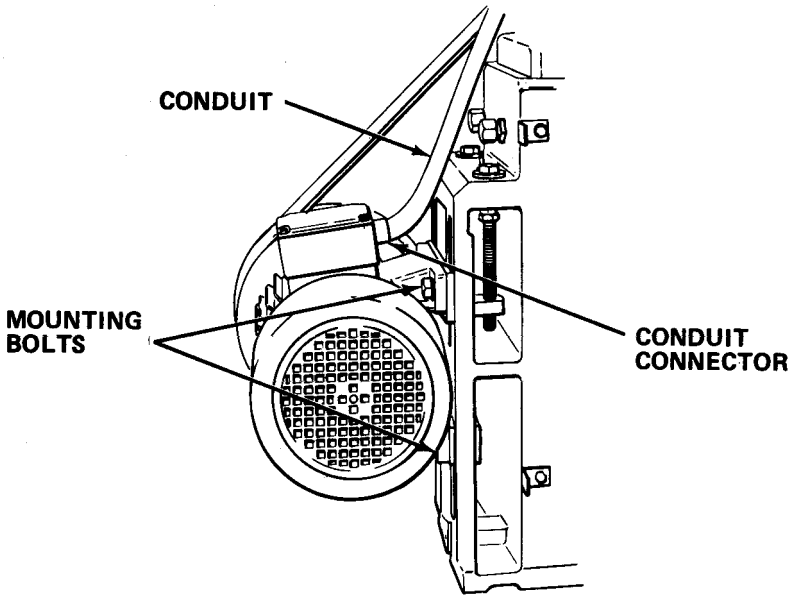
b. Perform steps b. through g. of paragraph 5-16.4 to remove V-belts.



c. Remove electrical box cover on motor and tag and disconnect wiring.

d. Remove conduit connector and conduit from electrical box on motor.

e. Place blocks of wood under motor as close as possible to motor's height.



f. Remove mounting bolts and defective motor.

g. Install new motor and secure in place with mounting bolts.

h. Reinstall conduit and conduit connector to electrical box on new motor.

i. Reconnect wiring to new motor.

j. Perform steps h. through t. of paragraph 5-16.4 to reinstall V-belts.

5-16.6 Replace Backgauge Motor V-Belt.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 10 mm Combination Wrench
13 mm Combination Wrench
19 mm Combination Wrench
Flat Tip Screwdriver

SUPPLIES: V-Belt
Wire Ties

WARNING

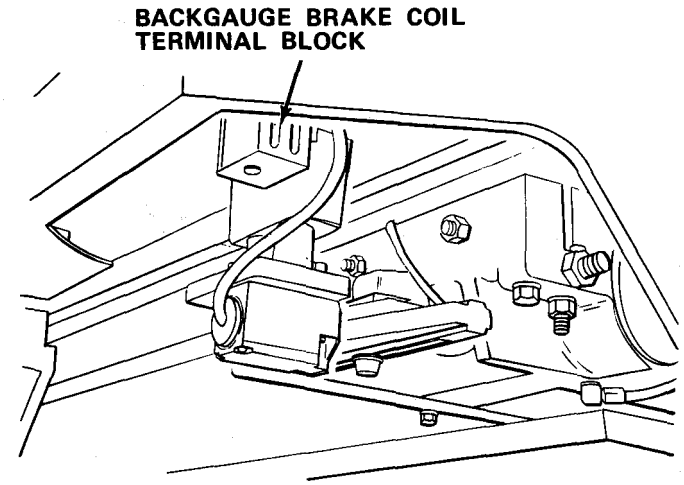
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

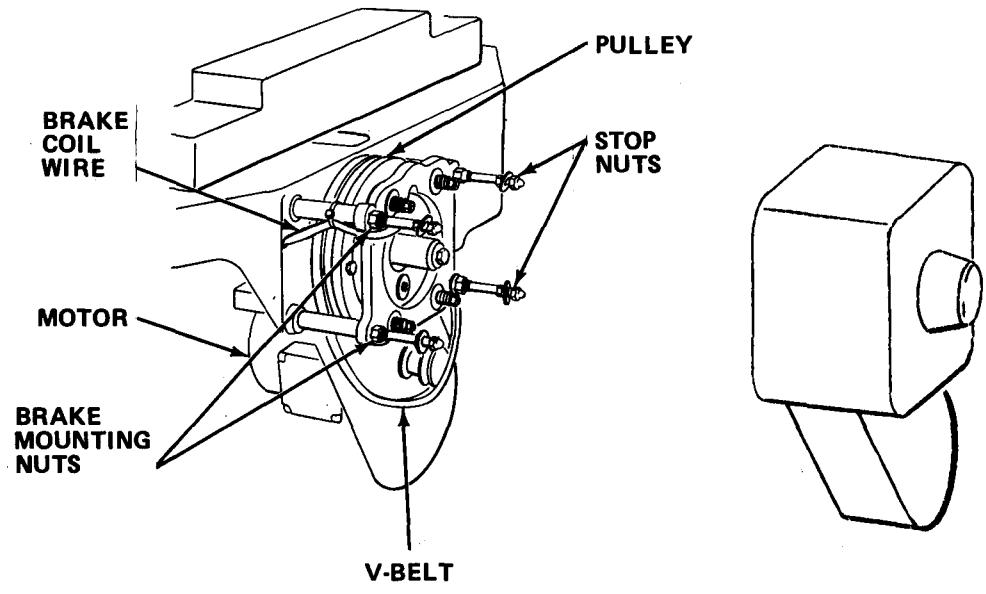
(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove nuts and backgauge V-belt cover.



c. Tag and disconnect brake coil wires from terminal block under table.



d. Remove four stop nuts and remove four nuts which secure brake to mounting studs, and remove brake.

e. Loosen four motor mounting bolts and slide motor back to loosen V-belt. Remove defective V-belt.

f. Install new V-belt. Pull against motor to tighten V-belt until it has 6 - 9 mm (1/4 - 3/8 in.) deflection when pressed. Tighten motor mounting bolts.

g. Reinstall brake and secure with four nuts.

h. Reconnect brake coil wires to terminal block.

i. Reinstall V-belt cover.

j. Place operator key back into safety lock.

5-16.7 Replace Backgauge Motor.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 7 mm Nut Driver
10 mm Combination Wrench
13 mm Combination Wrench

SUPPLIES: Backgauge Motor

WARNING

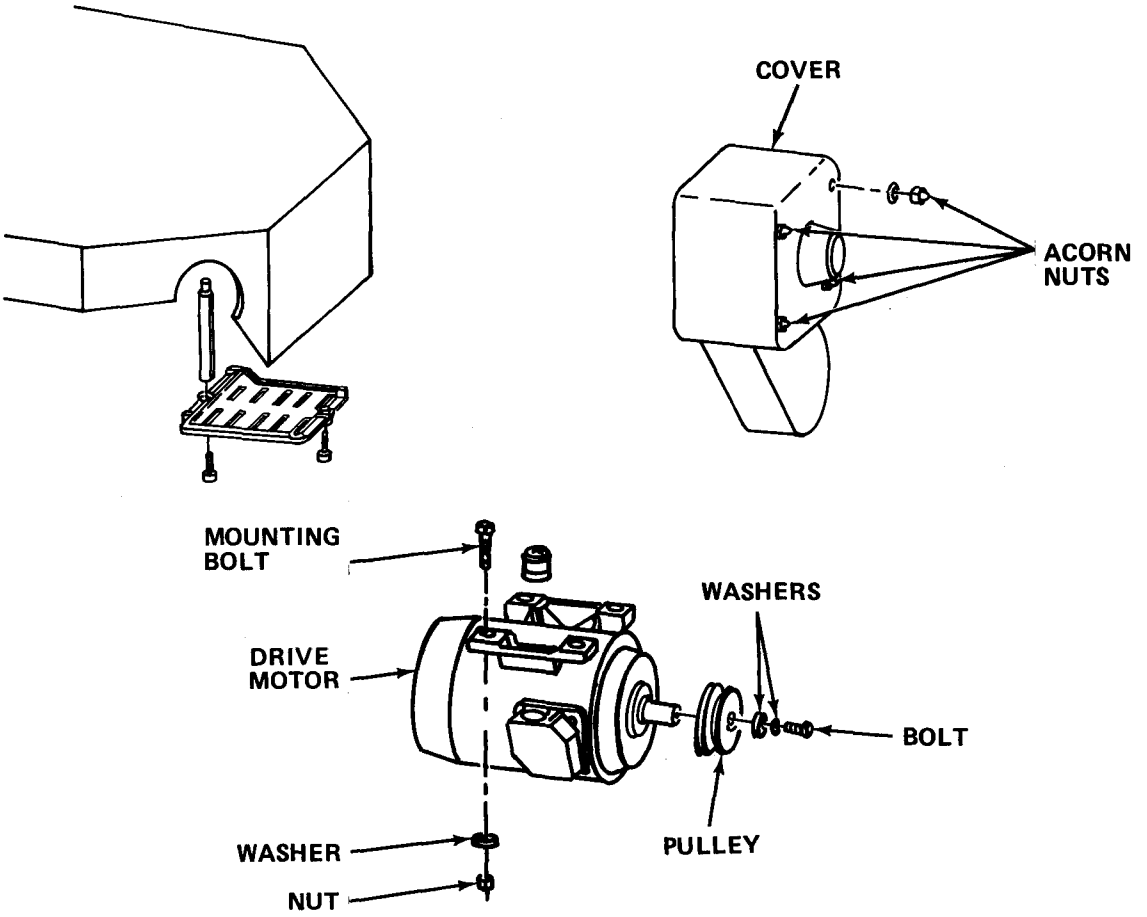
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove nuts and V-belt cover.



c. Remove cover from junction box, tag and disconnect wires from motor.

d. Loosen four mounting bolts and nuts, slide motor back, and disengage V-belt from pulley.

e. Remove bolt, washers, and pulley from end of motor shaft.

f. Remove mounting bolts and defective motor.

g. Place new motor in position and reinstall mounting bolts but do not tighten.

h. Reinstall motor pulley, washers, and bolt.

i. Place V-belt on motor pulley and pull against motor to tighten V-belt until it has 6 - 9 mm (1/4 - 3/8 in.) deflection when pressed. Tighten mounting bolts.

j. Reconnect wires to new motor and reinstall junction box cover.

k. Reinstall V-belt cover and secure with nuts.

l. Place operator key back into safety lock.

5-16.8 Replace Backguage Overload Relay.

MOS: 83FJ6, Reproduction Equipment Repairer

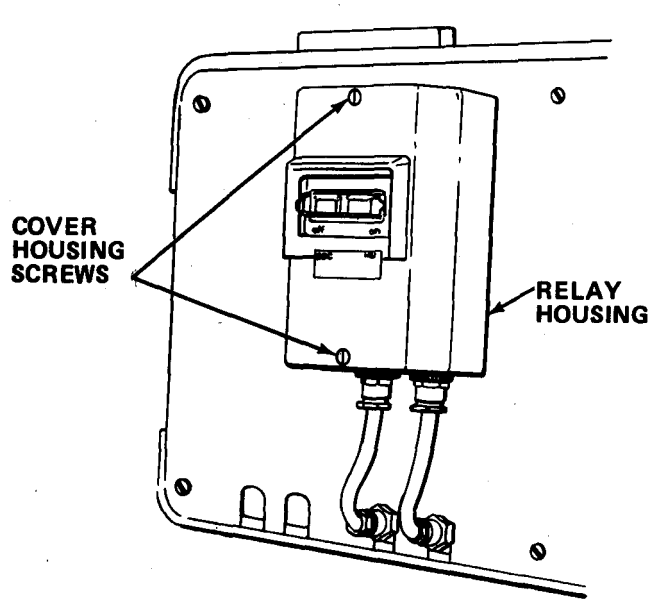
TOOLS: Flat Tip Screwdriver

SUPPLIES: Overload Relay

a. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.

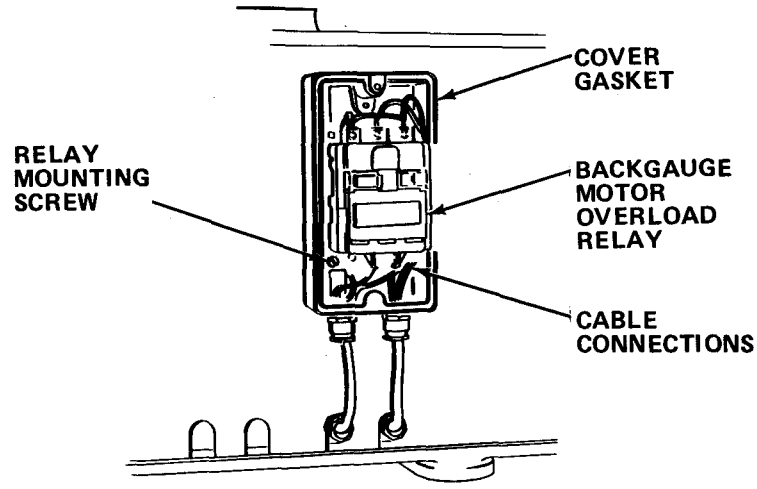


NOTE

There is a rubber gasket between cover and housing. Gasket must be reused.

b. Remove two screws holding relay cover in place and remove cover and gasket. Be careful not to damage gasket.

c. Tag and disconnect wiring.



d. Remove screws holding overload relay in place and remove defective relay.

e. Install new overload relay with mounting screws.

f. Reconnect wiring to relay in proper positions.

g. Reinstall gasket.

h. Reinstall cover and retain with mounting screws. Turn relay on (I).

i. Place operator key back into safety lock.

5-16.9 Replace Backgauge Limit Switches.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
No. 2 Cross Tip Screwdriver

SUPPLIES: Switch

WARNING

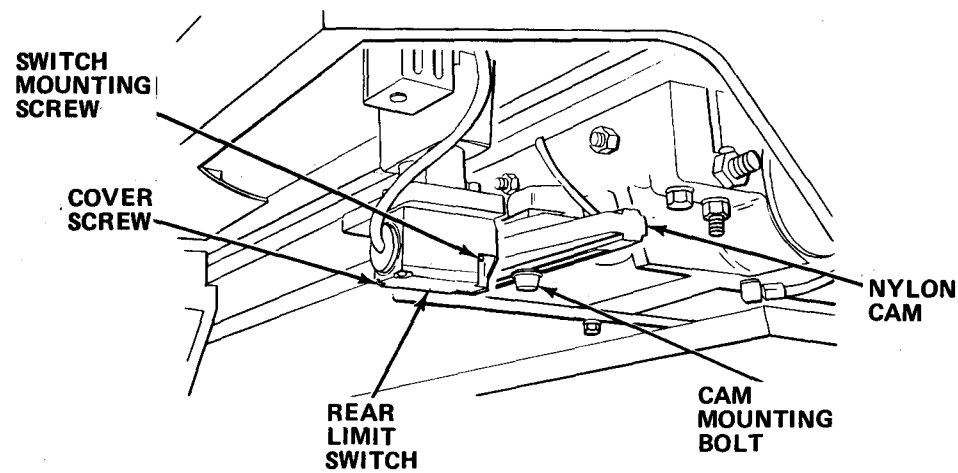
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove oil drip pans under backgauge table.



c. Remove screws on the cover of the defective switch and remove the cover.

d. Tag and disconnect wires from defective switch.

e. Remove retaining screws and defective switch.

f. Install new switch and loosely secure with retaining screws.

g. Reconnect wiring.

h. Reinstall cover and secure with screws.

i. Perform backgauge limit switch adjustment for new switch (paragraph 5-16.24).

5-16.10 Replace Clamp Foot Pedal.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 13 mm Combination Wrench
Flat Tip Screwdriver

SUPPLIES: Clamp Foot Pedal

WARNING

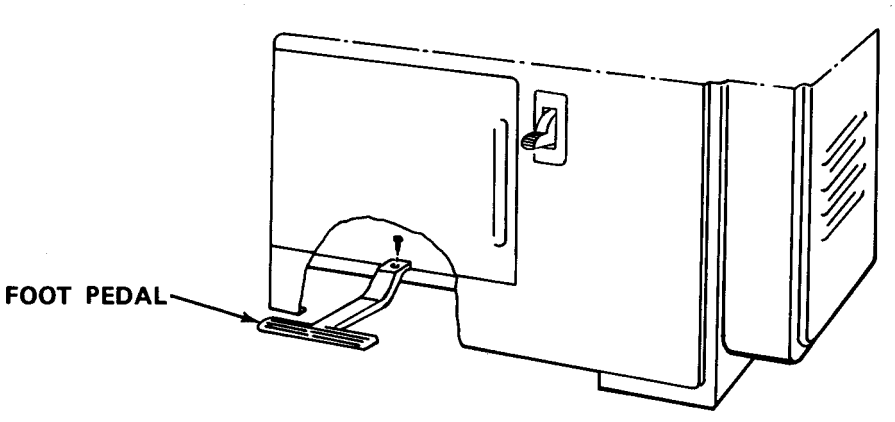
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove rear electronics enclosure cover.



c. Remove retaining bolt and wedge on rear of clamp foot pedal, and then remove defective clamp foot pedal from the front side of the cutter.

d. Insert new clamp foot pedal from the front, and secure with retaining bolt and wedge.

e. Reinstall rear electronics enclosure cover.

f. Place operator key back into safety lock.

g. Perform clamp foot pedal adjustments (paragraph 5-16.12, step h).

5-16.11 Replace Clamp Return Spring.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 24 mm Combination Wrench
17 mm Combination Wrench
Flat Tip Screwdriver
10 in. Adjustable Wrench
Snap Ring Pliers

SUPPLIES: Return Spring

WARNING

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

a. Turn off power.

(1) Turn main power switch to 0 position.

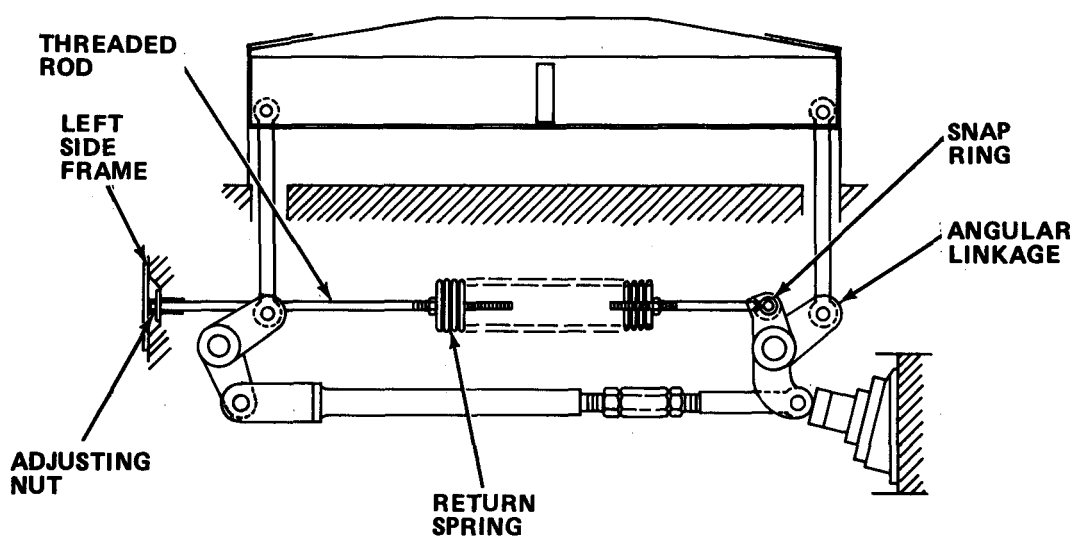
(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove rear electronics enclosure cover.

NOTE

Be sure to record the number of turns the adjustment nut is rotated. The same number of turns are required to reinstall adjusting nut properly.

c. Loosen the return spring fully by rotating adjusting nut to the left.



d. Remove snap ring from spring shaft retaining pin.

e. Remove defective spring with attached hardware from angular linkage.

f. Unscrew defective spring from threaded rod.

h. Reinstall spring mounting bars to angular linkage and secure with retaining pin and snap ring.

i. Reinstall spring mounting bars, spring and attached hardware onto angular linkage.

j. Thread the other end of spring to the adjusting rod.

k. Rotate adjusting nut to the right the same number of turns it was loosened in step c.

l. Reinstall rear electronics enclosure cover.

m. Turn on power.

(1) Using operator key, unlock the safety lock.

(2) Turn main power switch to I position.

(3) Press control power on switch.

WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

n. To increase the spring tension, turn the adjusting nut to the right. This will increase the speed of the clamp return.

o. To decrease the spring tension, turn the adjusting nut to the left. This will slow down the clamp return and ease the downward action of the clamp.

p. Perform several clamping operations with the foot pedal. Repeat steps n. and o. until the clamp's downward and upward motions are smooth.

q. Turn main power switch to 0 position.

5-16.12 Replace Clamp Pedal Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 10 mm, 1/4 in. Drive Socket and Ratchet
Metric Feeler Gages (0.5 mm - 3.2 mm)
Flat Tip Screwdriver

SUPPLIES: Clamp Pedal Switch

WARNING

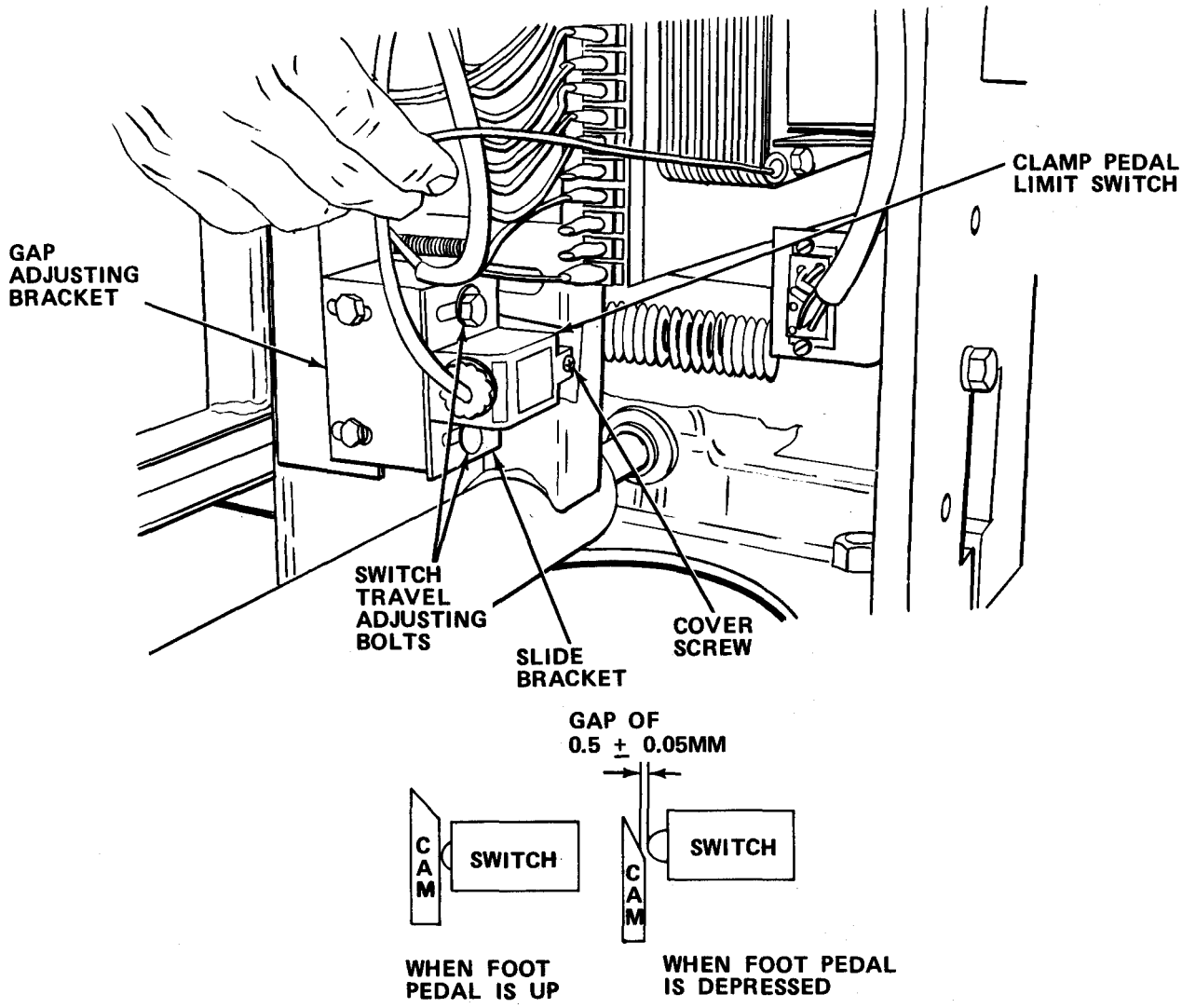
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove rear and front covers to electronics enclosures.



c. Remove switch mounting screws and pull switch away to allow access to cover.

d. Remove switch cover screws and cover.

e. Tag and disconnect wiring.

f. Remove plastic cover on new switch, reconnect wiri ng and reinstall wiring cover.

g. Mount new switch on slide bracket and install but do not tighten screws.

NOTE

If necessary, slide bracket may be moved to obtain the proper switch travel adjustment.

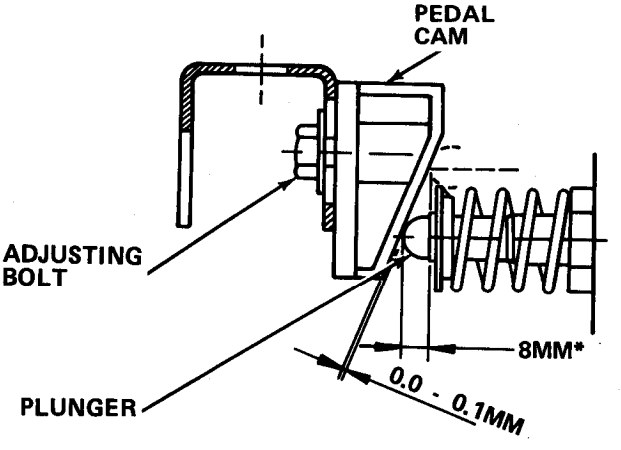
h. Move switch toward cam until all slack is removed, then move switch away from cam 0.8 - 3.2 mm (1/32 - 1/8 in.) and tighten screws.

i. Adjust clearance as follows:

(1) Press and hold foot pedal down.

(2) Measure the clearance between the switch button and cam. Clearance should be 0.50 ± 0.05 mm (0.020 ± 0.002 in.).

(3) If clearance is incorrect, loosen the bolt and move the gap adjusting bracket to obtain the proper clearance and retighten bolts.



(4) Check adjustment of pedal cam on opposite side and adjust it for proper operation as performed in previous steps.

j. Reinstall front and rear electronics enclosure covers.

k. Place operator key back into safety lock.

5-16.13 Replace Knife.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: T-Handle Key (8 mm Hex Head key)
Knife Carrying Handles (2)
Knife Setting Gage
36/41 mm Double Open End Wrench (2)

SUPPLIES: Knife

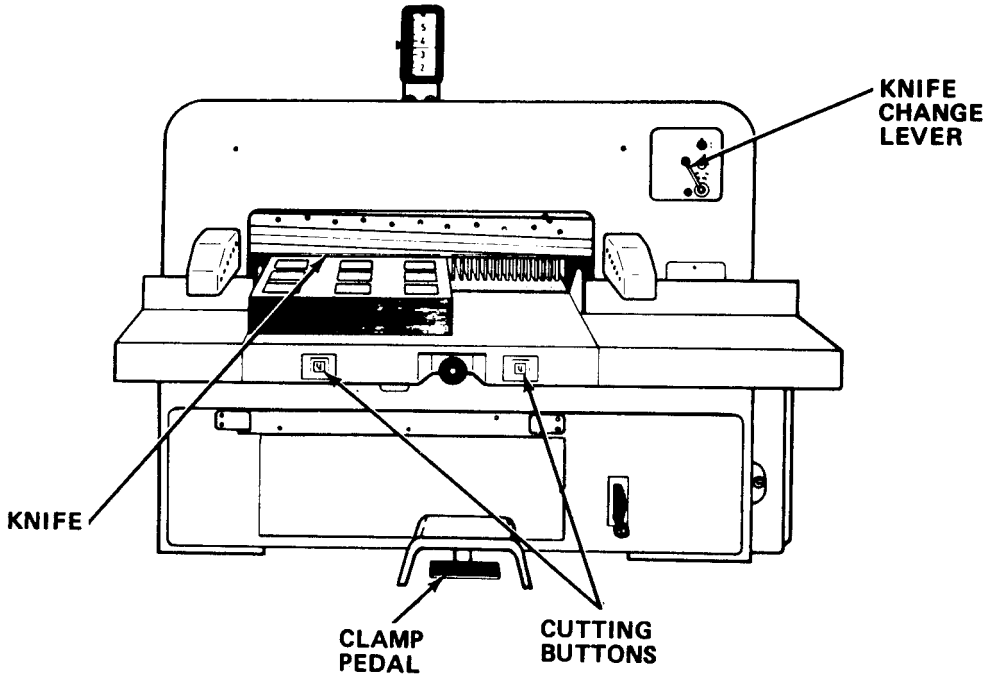
a. Turn on circuit breaker.

b. Using operator key, unlock safety lock.

c. Turn on power.

(1) Turn main power switch to I position.

(2) Press control power on switch.



WARNING

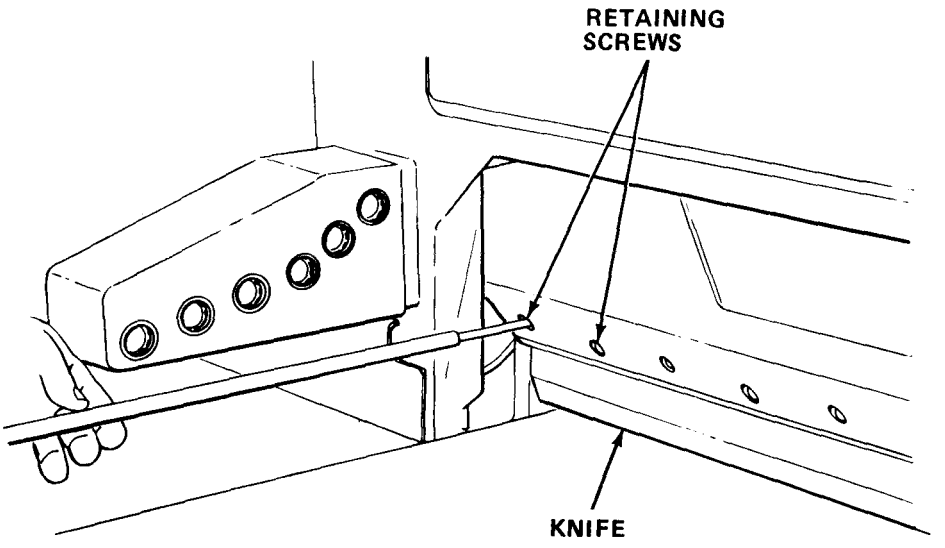
Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.

d. Step on clamp foot pedal and lower clamp to table and hold.

e. Rotate manual knife change lever to knife change position; then release foot pedal.

f. Pressing both cutting buttons, lower knife.

g. Remove two knife retaining screws on the left side.



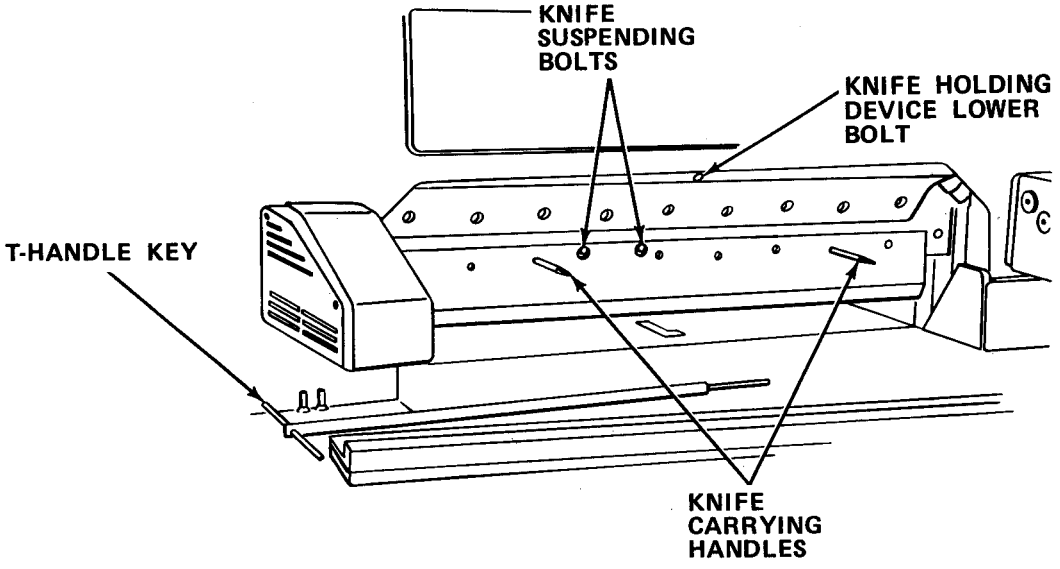
h. Pressing both cutting buttons, raise knife to its upper position.

i. Remove remaining knife retaining screws.

j. Insert T-handle key into the knife holding device lower bolt and turn right until knife is completely lowered.

WARNING

Use extreme care when handling the knife. The knife is extremely sharp and death or serious injury may occur from failure to observe this warning.



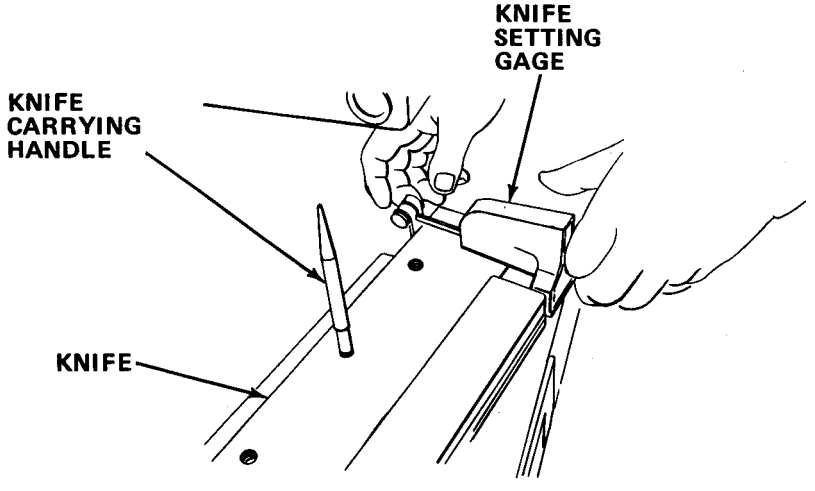
k. Screw the knife carrying handles into two bolt holes, remove knife from suspending bolts and place knife into the knife holding box.

l. Turn or change the cutting stick as necessary (paragraph 5-10.3).

m. Using the knife carrying handles, place the new knife on a flat surface.

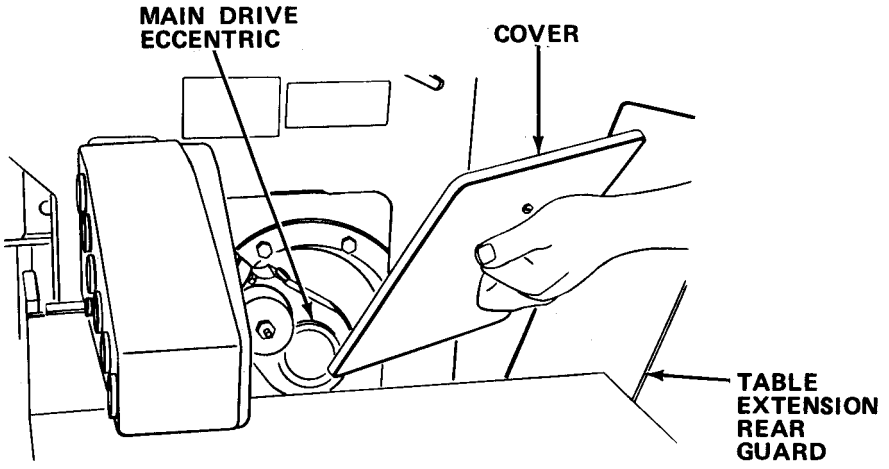
n. Insert T-handle key into the knife holding device lower bolt and turn to the left until holding device is completely raised.

o. Using the knife setting gage, measure the width of the new knife.

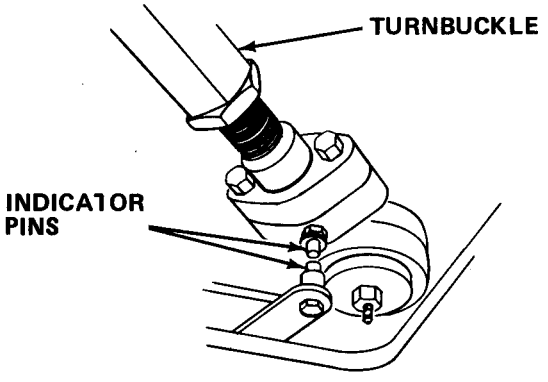


WARNING

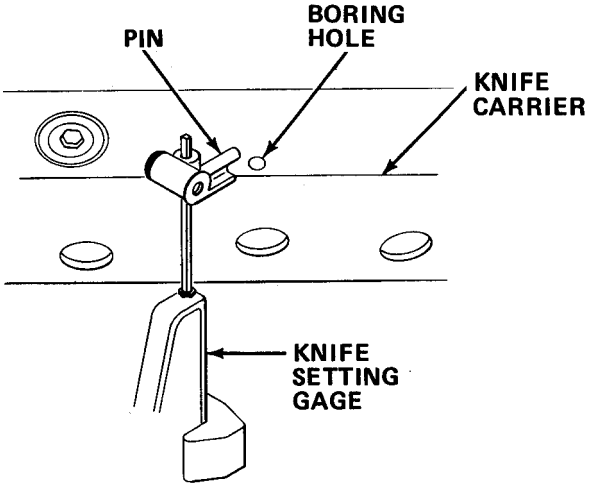
Always keep clear of moving parts while performing this task. Serious injury may occur.



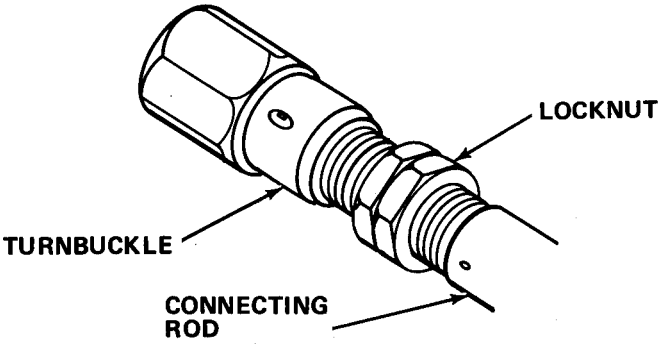
p. Remove eccentric cover. Using the cutting buttons, lower the knife carrier until the markers are alined, indicating that the knife carrier is in its lowest position.



q. Move adjusted knife setting gage to the knife carrier. If the indicating pin alines with the boring hole in the knife carrier, proceed to step u., if not, continue with step r. below.



r. Loosen locknuts on connecting rod.



s. By turning the turnbuckle, adjust th e knife carrier to position which allows the gage indicating pin to al ine with the boring hole.

t. Tighten locknuts on connecting rod.

u. Raise the knife carrier by pressing both cutting buttons.

WARNING

Use extreme care when handling the knife. The knife is extremely sharp and death or serious injury may occur from failure to observe this warning.

w. Using knife carrying handles, place knife onto the knife suspending bolts.

x. Raise the knife holding device.

y. Lower the knife by pressing both cutting buttons.

z. Insert the knife retaining screws starting from the center to the outsides, and tighten screws with T-handle.

aa. Pressing the cutting buttons, raise knife.

ab. Insert one right knife retaining screw and tighten.

ac. Rotate manual knife change lever to cutting position.

ad. Pressing the cutting buttons, raise the knife to its upper position.

ae. Insert a sheet of paper under the knife at both ends of the knife.

af. Press down on the clamp foot pedal and hold.

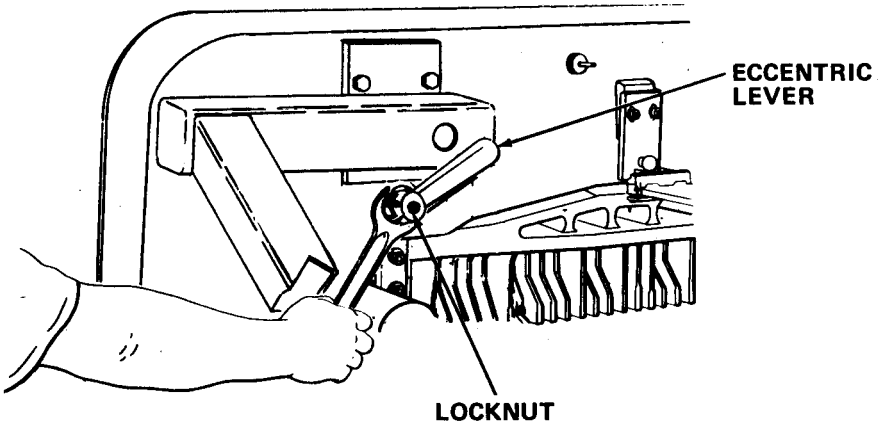
ag. Press both cutting buttons. When knife has completed its cut and reached the top, verify that both pieces of paper have been completely cut.

ah. If both pieces of paper have been completely cut, proceed to step aj. If not, perform the following:

(1) Step on clamp foot pedal and lower clamp to table and hold.

(2) Rotate manual knife change lever to knife change position; then release foot pedal.

(3) Pressing both cutting buttons, lower knife to its lowest position.



(4) Loosen locknuts on knife eccentrics and adjust the eccentrics until the knife is parallel; then tighten the locknuts.

(5) Loosen locknuts on turnbuckle and adjust turnbuckle until knife just touches the cutting stick; then tighten locknuts.

(6) Press both cutting buttons again and raise the knife.

(7) Rotate manual knife change lever to cutting position.

(8) Place a sheet of paper under the knife at both ends.

(9) Press both cutting buttons and perform a cut.

(10) If both pieces of paper were not cut, loosen locknuts on turnbuckle and rotate turnbuckle 1/4 of a turn; then tighten locknuts.

aj. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operating key, lock the safety lock.

5-16.14 Replace Connecting Rod Shear Bolts.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 12 mm Open End Wrench (2)

SUPPLIES: Shear Bolts

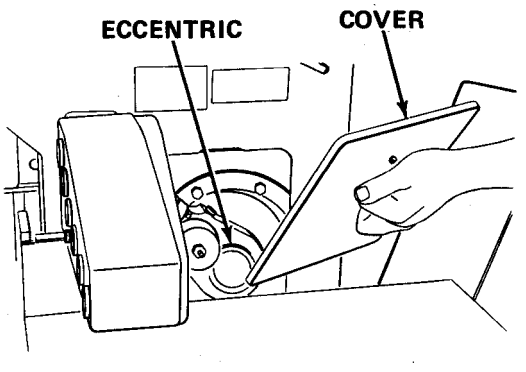
WARNING

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

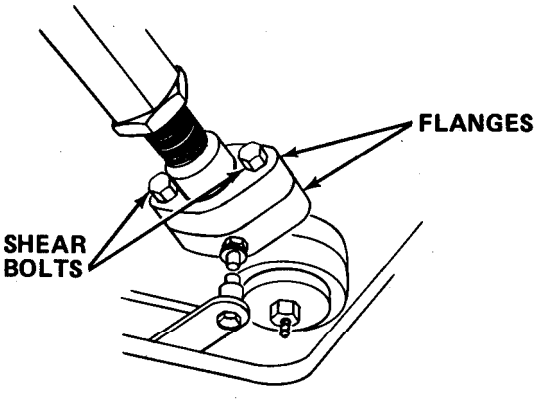
a. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.



b. Remove eccentric cover.



c. Remove nut(s) and defective shear bolt(s).

d. Aline flanges by manually moving knife carrier (paragraph 5-16.27).

e. Install new shear bolt(s) and secure with nut(s).

f. Perform manual knife carrier movement to raise knife to top dead center (paragraph 5-16.27).

g. Reinstall eccentric cover.

h. Place operator key back into safety lock.

5-16.15 Replace Main Power Switch and/or Control Power On Switch.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Electrician's Knife
Flat Tip Screwdrivers
Heat Shrink Gun

SUPPLIES: Main Power Switch
Control Power Switch
1-1/2 in. Shrink Tubing

WARNING

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

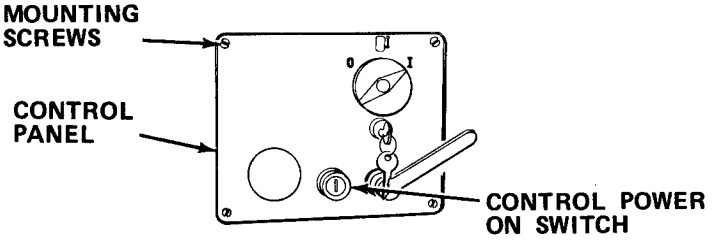
a. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. To replace main power switch, proceed to step d.

c. To replace control power on switch, proceed as follows:



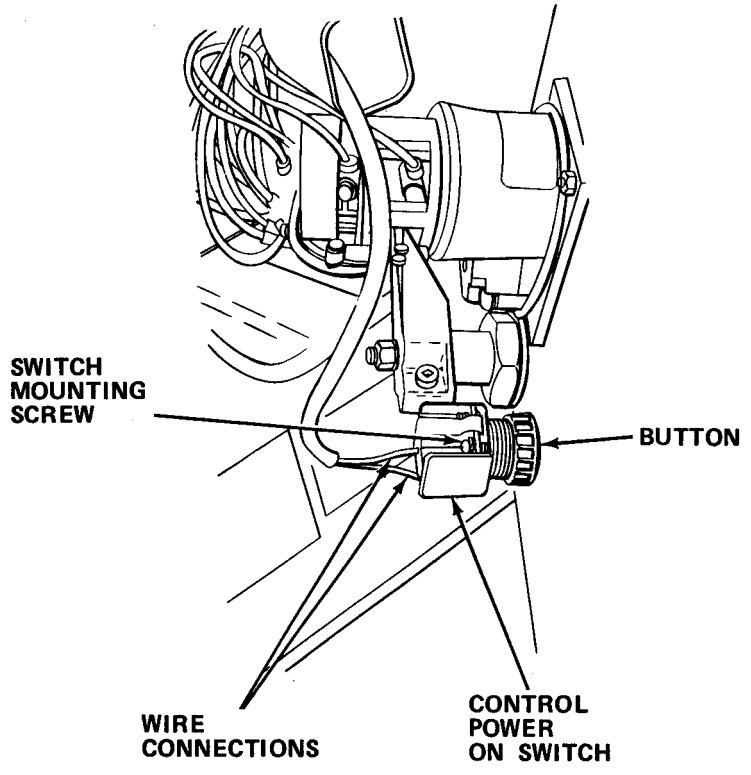
(1) Remove four mounting screws holding control panel in place.

CAUTION

Main control panel is connected to paper cutter via a rod attached to knife change lever. Panel cannot be pulled away from paper cutter more than a few inches without damage to rod.

(2) Pull panel a few inches away from paper cutter and turn is so that rear of control power on switch is visible.

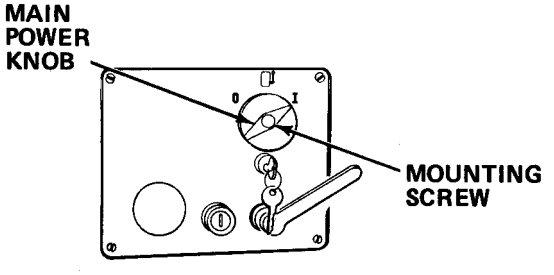
(3) Remove heat shrink tubing from switch.



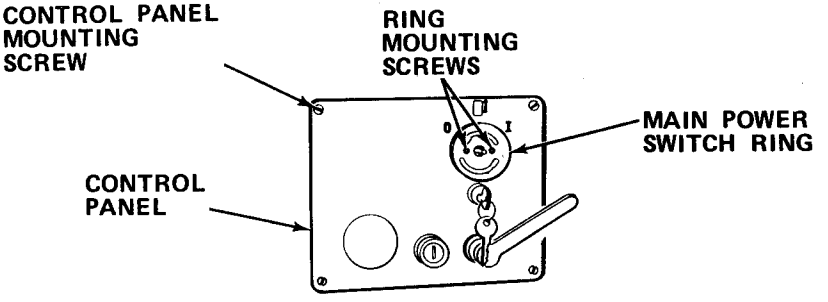
(4) Tag and disconnect wires from defective switch.

(5) Remove mounting screw and remove defective switch from button.

(6) Install new switch and secure with mounting screw, and proceed to step e.



d. Remove main power switch knob.

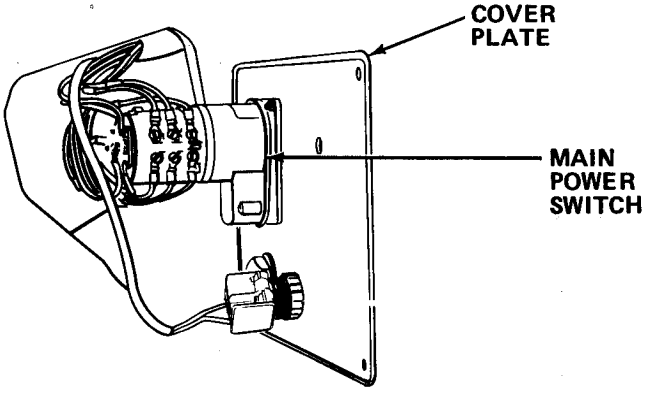


(1) Remove main power switch ring.

(2) Remove four screws holding control panel in place and remove cover

CAUTION

Main control panel is connected to paper cutter via a rod attached to knife change lever. Panel cannot be pulled away from paper cutter more than a few inches without damage to rod.



(3) Pull panel a few inches away from paper cutter so that rear of main power switch is visible.

(4) Tag and disconnect wires.

(5) Remove two mounting screws, nuts, and lockwashers, and remove defective switch.

(6) Insert new switch and secure with screws, nuts and lockwashers.

(7) Reinstall cover plate and main power switch ring.

(8) Reinstall main power switch knob using mounting screw.

e. Reconnect wiring to new switch.

f. Reinstall control panel and secure with mounting screws.

g. Turn on circuit breaker.

5-16.16 Replace Cutting Button(s).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Cutting Button

WARNING

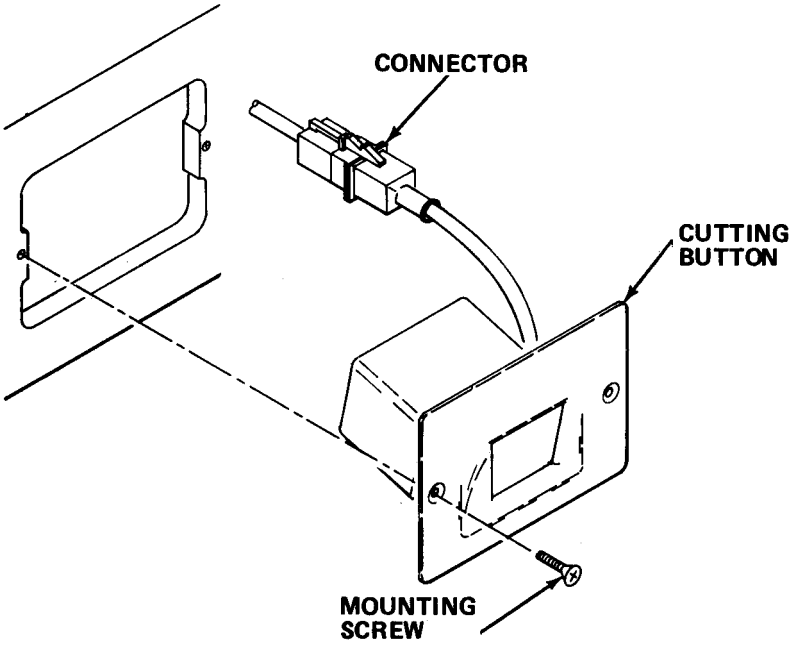
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Disconnect plug connector from defective cutting button.



c. Remove retaining screws and defective cutting button.

d. Install new cutting button and secure with screws.

e. Reconnect plug connector.

f. Place operator key back into safety lock.

5-16.17 Replace Safety Bolt Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
4 mm Hex Head Key Wrench
6 mm Hex Head Key Wrench

SUPPLIES: Safety Bolt

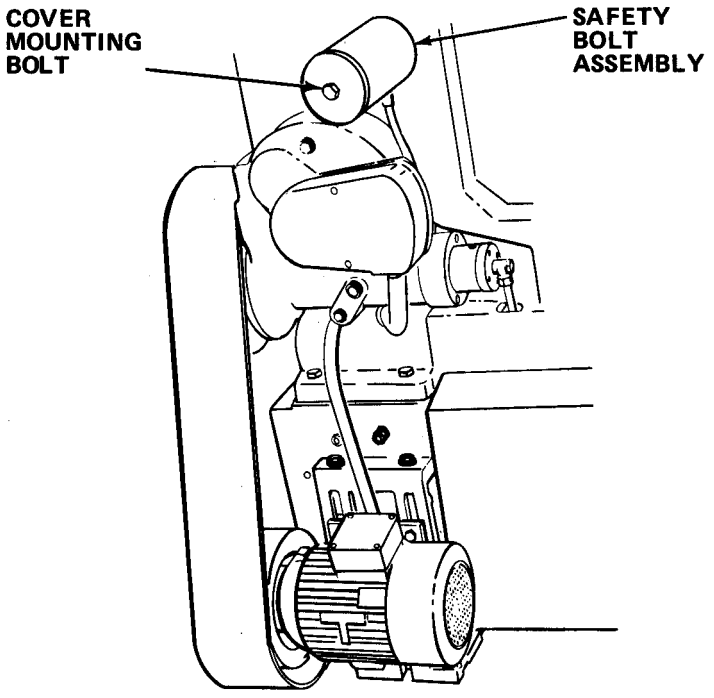
WARNING

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

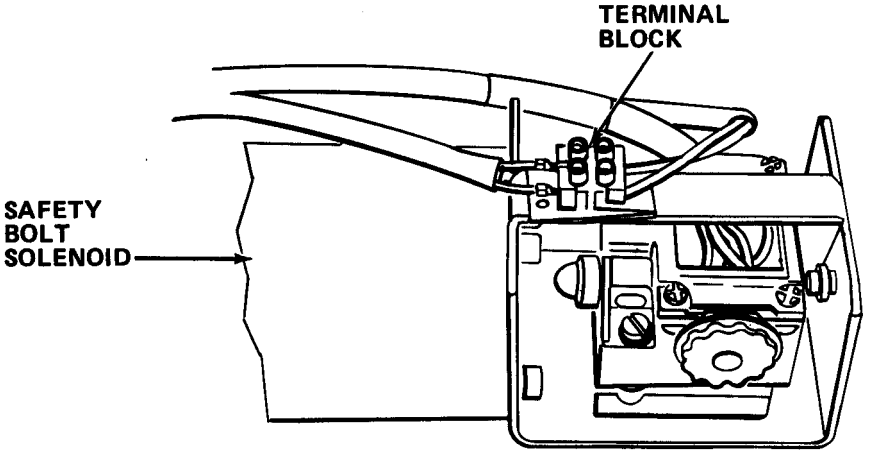
a. Turn off power.

(1) Turn main power switch to 0 position.

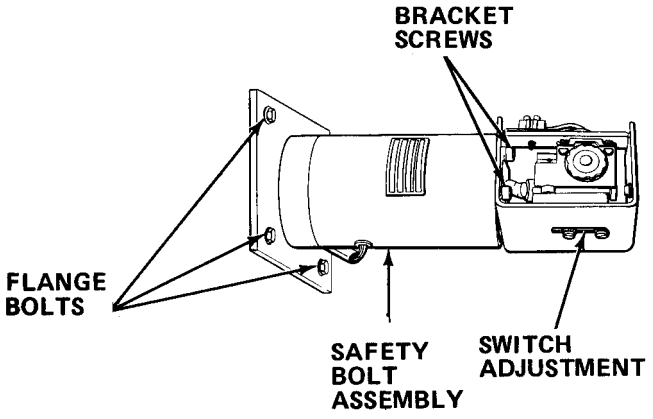
(2) Using operator key, lock safety lock and keep key in your possession.



b. Remove safety bolt cover.



c. Tag and disconnect safety bolt solenoid wiring from terminal block.



d. Loosen adjustment screws and slide switch back to allow access to bracket screws.

e. Remove screws and bracket.

f. Remove flange bolts and safety bolt assembly.

g. Install new safety bolt assembly and secure with flange bolts.

h. Reinstall bracket and secure with screws.

i. Reconnect solenoid wiring to terminal block.

j. Turn on power.

(1) Using operator key, unlock safety lock.

(2) Turn main power switch to I position.

(3) Press control power on switch.

k. Momentarily press the cutting buttons to activate the safety bolt solenoid.

l. Loosen switch adjustment screws. Adjust position of switch so that solenoid rod depresses switch plunger and activates switch.

m. Tighten adjustment screws.

n. Press both cutting buttons and complete the cut cycle.

o. Turn main power switch to 0 position.

p. Reinstall safety bolt cover.

5-16.18 Replace Gear Limit Switches.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
Metric Feeler Gage (0.3 mm)

SUPPLIES: Switch

WARNING

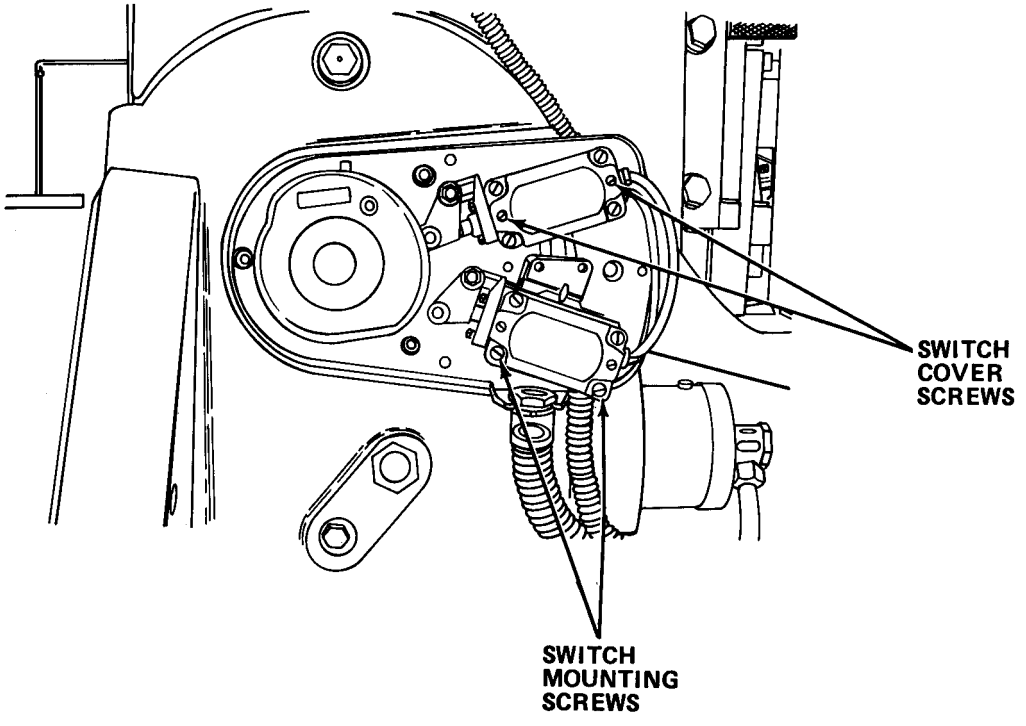
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove gear limit switches cover.



c. Remove switch covers.

d. Tag and disconnect wiring from switches.

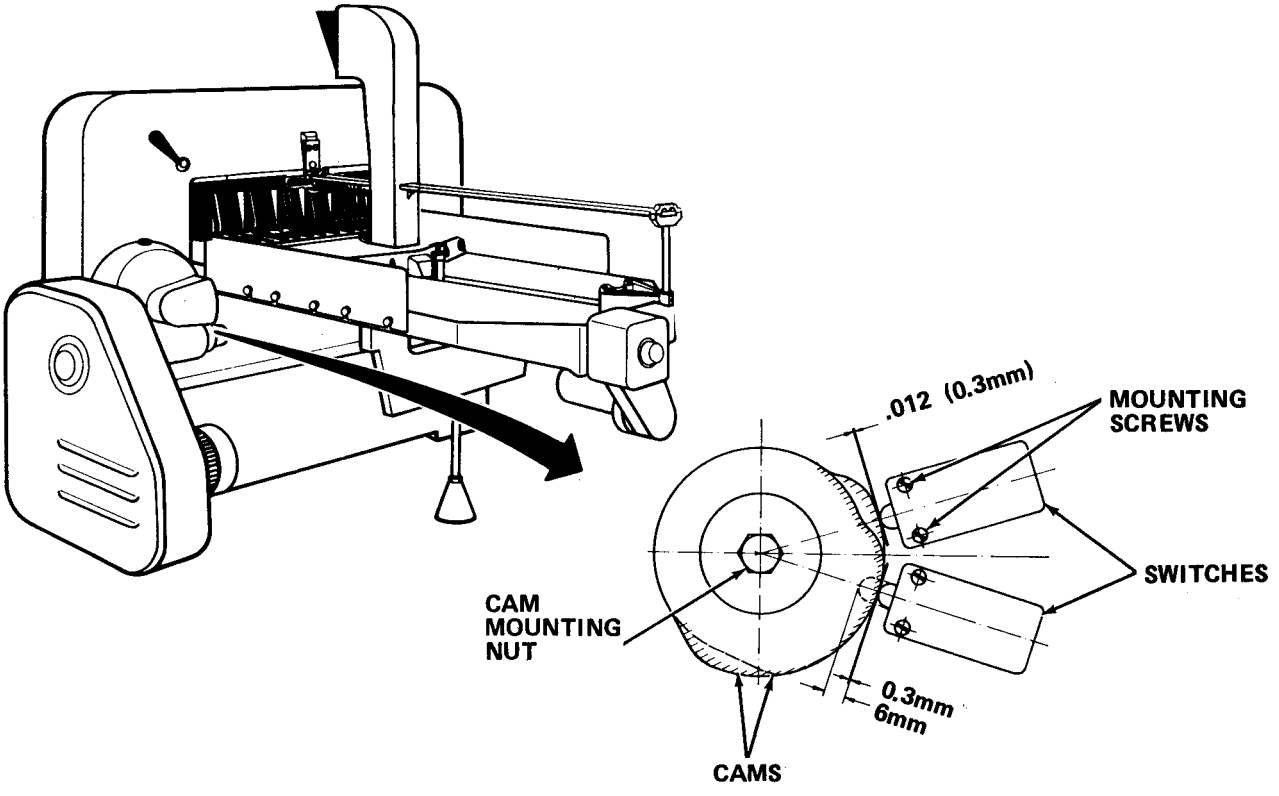
e. Remove mounting screws and defective switch.

f. Install new switch. Retain with screws but do not tighten.

g. Reconnect wiring in proper positions.

h. Adjust gear limit switches as follows:

(1) Perform manual knife carrier movements, paragraph 5-16.27 steps b. through h. to ensure that knife is at highest position.



(2) On limit switch labeled “B”, adjust limit switch so that maximum movement left in the activation of the switch is 0.30 mm (.011 in.); then tighten mounting screws.

(3) Rotate reset handles so that limit switch labeled “A” is fully activated by the cam (this step lowers knife carrier to its lowest position).

(4) Adjust limit switch so that maximum movement left in the activation of the switch is 0.30 mm (.011 in.); then tighten mounting screws.

(5) Perform manual knife carrier movements, paragraph 5-16.27, steps b through m to ensure that knife is at highest position.

i. Reinstall cover to gear limit switches.

j. Place operator key back into safety lock.

5-16.19 Repair Left Light Barrier Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdrivers (2)
7 mm Nut Driver

SUPPLIES: Relay Board
Lamp
Lamp Lens

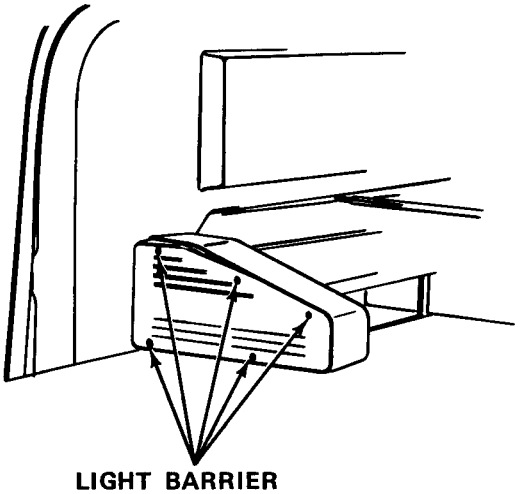
WARNING

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

a. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.



LIGHT BARRIER MOUNTING SCREWS

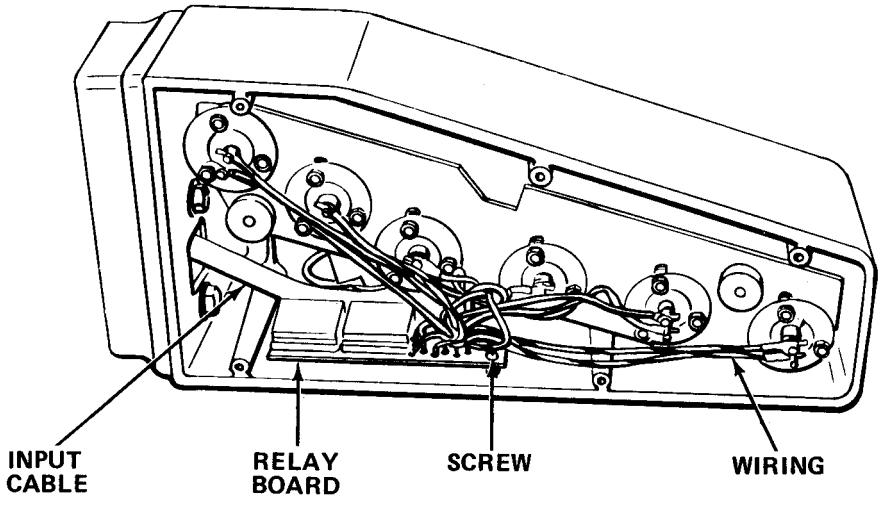
b. Remove left side light barrier emitter cover.

c. To adjust focus, proceed to step i.

d. To replace lamp lens, proceed to step h.

e. To replace lamp, proceed to step g.

f. To replace relay board, proceed as follows:



(1) Tag and disconnect wires from emitter bulb sockets.

(2) Remove two screws holding relay board in place.

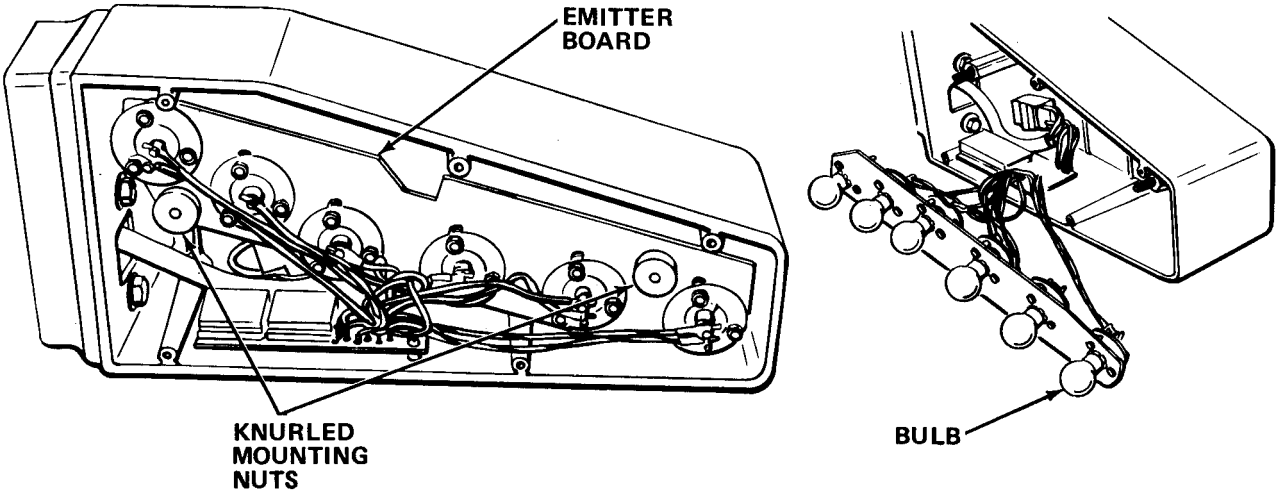
(3) Unplug and remove defective relay board.

(4) Plug connector of new board into input cable connector.

(5) Install new relay board with two mounting screws.

(6) Reconnect wiring from new board to terminals of emitter bulbs and tighten terminal screws, then proceed to step j.

g. To replace lamp, proceed as follows:



(1) Remove knurled nuts holding emitter plate in place and pull out emitter plate.

(2) Push and rotate defective bulb 90 degrees and remove bulb.

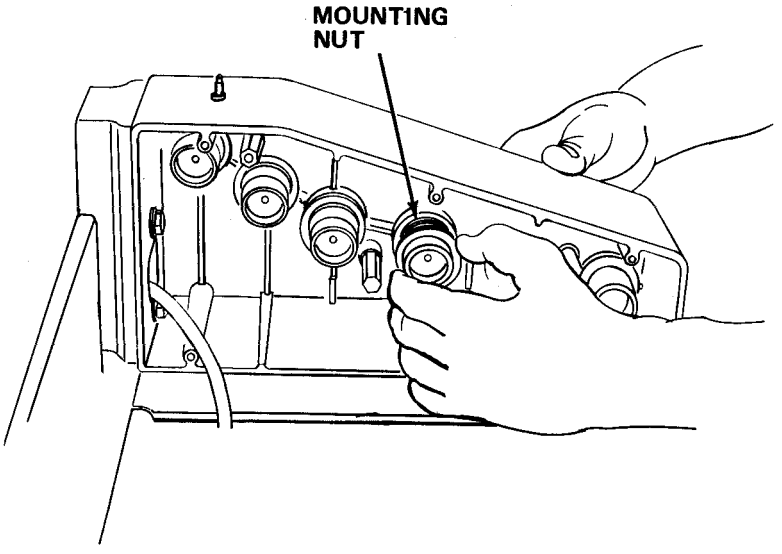
(3) Insert new bulb in socket by pushing and rotating 90 degrees.

(4) Reinstall emitter plate and secure with knurled nuts.

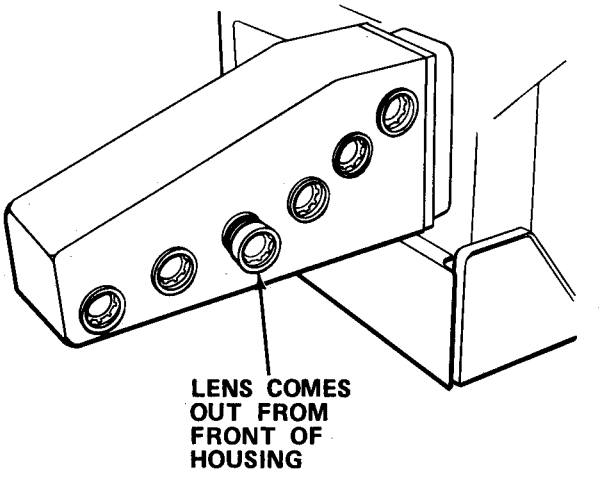
(5) Proceed to step i. for adjustment of lamp focus.

h. To replace lamp lenses, proceed as follows:

(1) Remove knurled nuts holding emitter plate in place and pull out emitter plate.



(2) Remove mounting nut holding lens against inside frame.



(3) Slide old lens out the front of frame.

(4) Insert new lens and secure in place with mounting nut.

(5) Reinstall emitter plate and secure in place with knurled nuts.

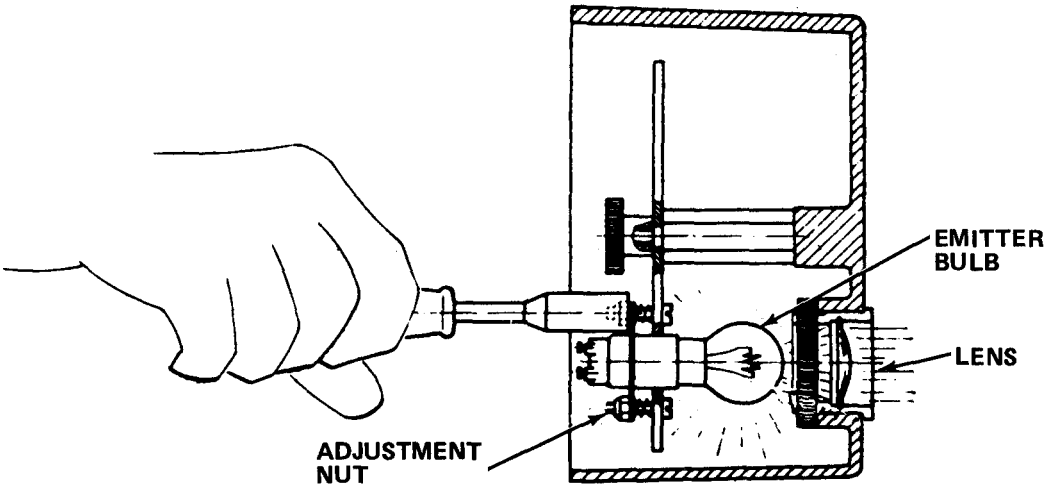
(6) Proceed to next step for adjustment of lamp focus.

i. Adjust light barrier focus as follows:

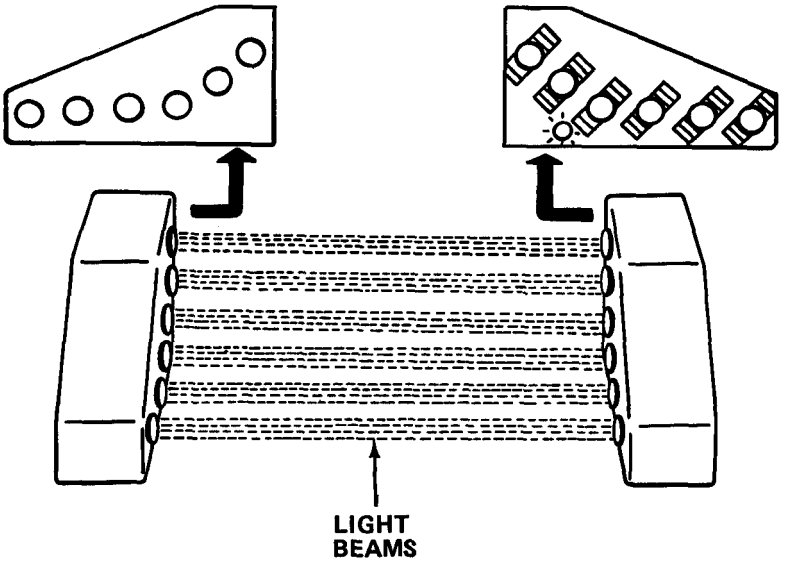
(1) Using operator key, unlock safety lock.

(2) Turn main power switch to I position.

(3) Press control power on switch.



(4) Rotate each adjustment nut an equal amount until light beams show a definite bulb filament pattern.



(5) Rotate adjustment nuts individually until beam is centered on detector in opposite light barrier housing.

(6) Adjust each emitter bulb in accordance with steps (4) and (5) above.

NOTE

If all lamps are properly adjusted; signal lamp will be on until beam is broken.

(7) Turn main power switch to 0 position, and proceed to next step.

j. Reinstall emitter cover and retain with screws.

k. Place operator key back into safety lock.

5-16.20 Repair Right Light Barrier Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Photo Element Board
Lamp Lens
Signal Lamp

WARNING

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

a. Turn off power.

(1) Turn main power switch to 0 position.

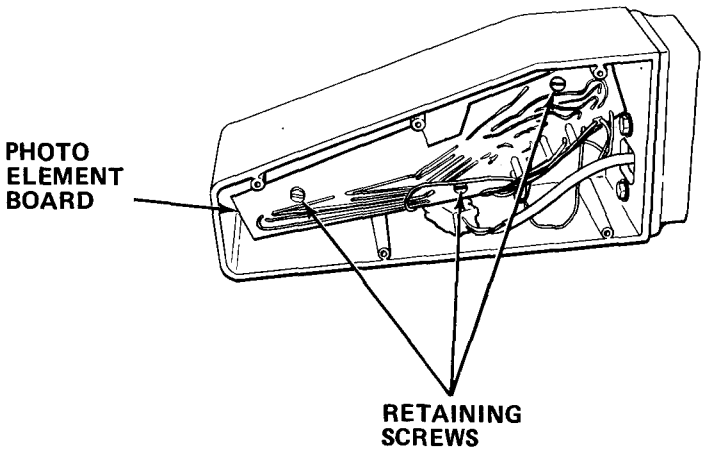
(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove screws holding right light barrier cover panel in place and remove cover.

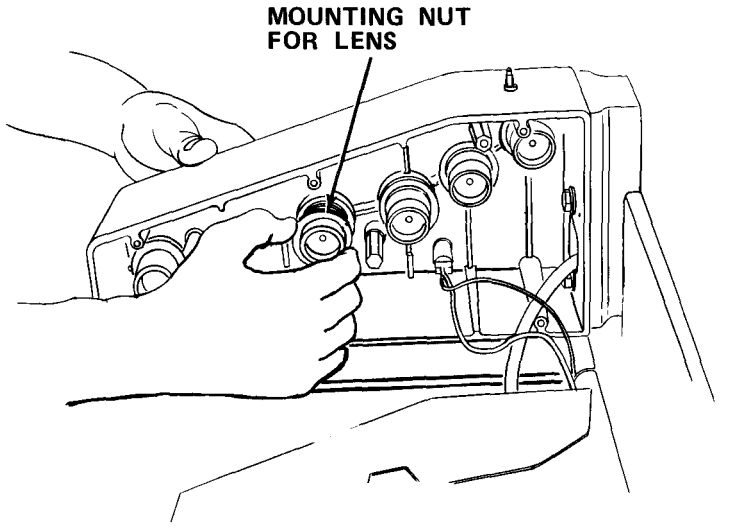
c. To replace signal lamp, proceed to step g.

d. To replace photo element board, proceed to step f.

e. To replace lens, proceed as follows:

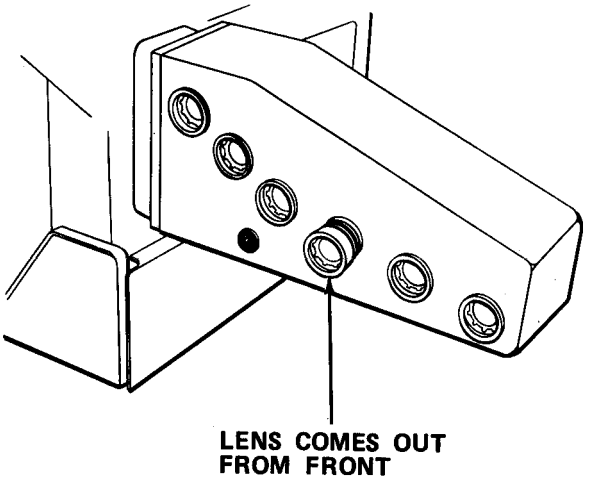


(1) Remove three screws holding photo element board in place and set photo element board aside.



(2) Remove mounting nut holding lens against inside frame.

(3) Slide old lens out the front of frame.



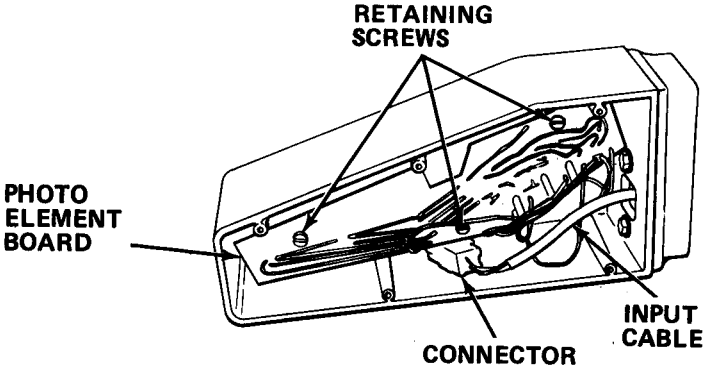
(4) Insert new lens and secure in place with mounting nut.

(5) Reinstall photo element board and secure with screws.

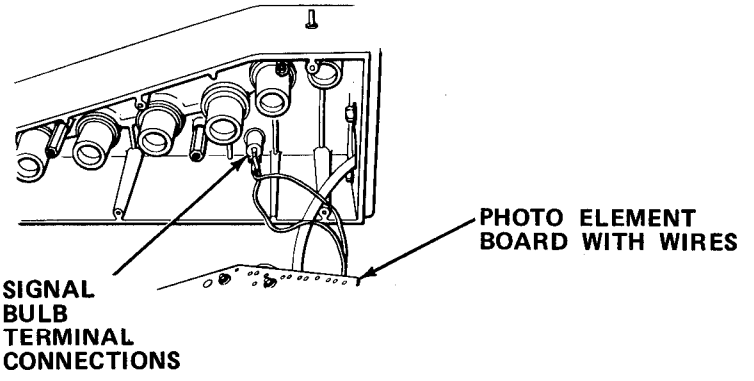
(6) Reinstall light barrier cover and retain with screws.

(7) Place operator key back into safety lock.

f. To replace photo element board, proceed as follows:



(1) Disconnect photo element board connector and disconnect wires from signal lamp.



(2) Remove screws and defective photo element board.

(3) Install new board and secure with screws.

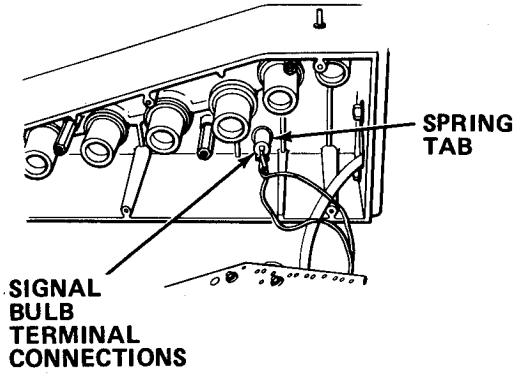
(4) Plug in new photo element board connector and reconnect wires to signal lamp.

(5) Reinstall light barrier cover and retain with screws.

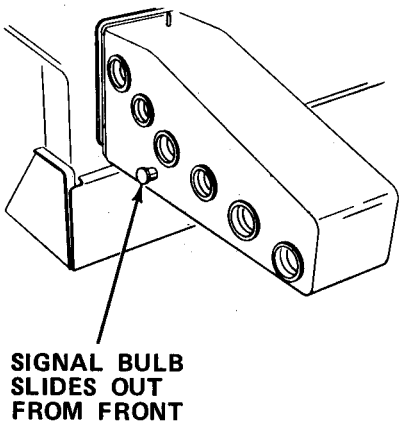
(6) Place operator key back into safety lock.

g. To replace signal lamp, proceed as follows:

(1) Disconnect wiring to signal lamp.



(2) Press spring tabs and remove defective lamp from front of housing.



(3) Install new signal lamp.

(4) Reconnect wiring.

(5) Reinstall light barrier cover and retain with screws.

(6) Place operator key back into safety lock.

5-16.21 Repair Table Lamp.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
6 mm Hex Head Key Wrench
10 mm Combination Wrench
Pliers

SUPPLIES: Toggle Switch
Capacitor
Butt Connectors
Ballast

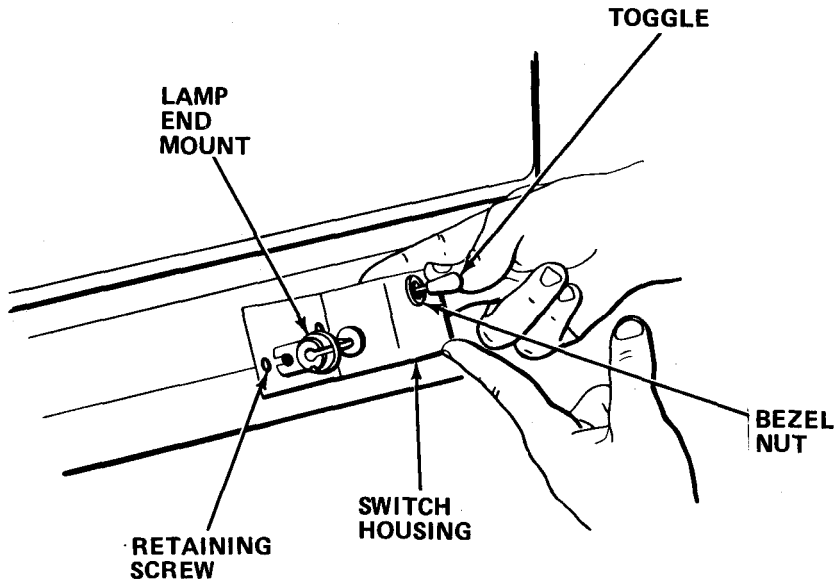
WARNING

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

a. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock safety lock and keep key in your possession.



b. To replace toggle switch, proceed as follows:

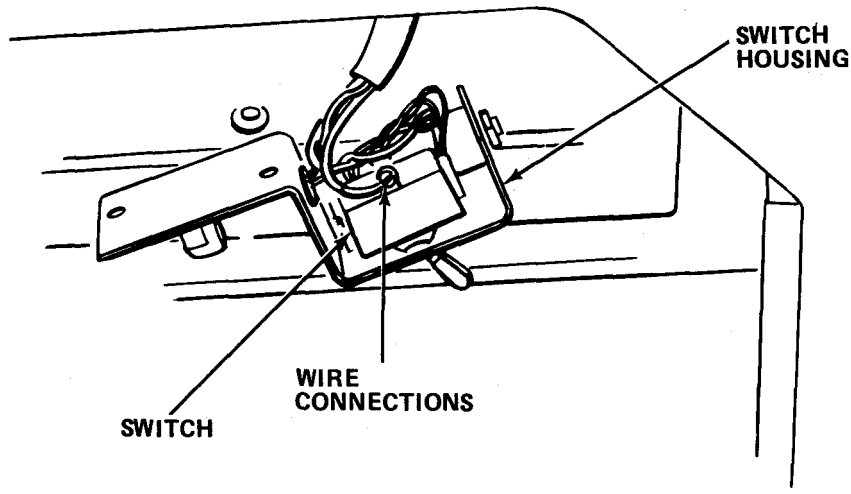
(1) Remove fluorescent lamp.

(2) Remove right side cable holddown.

(3) Remove retaining screws on switch housing and carefully lower switch and mounting bracket.

(4) Remove bezel nut on switch and lift defective switch from switch housing.

(5) Tag and disconnect wiring from defective switch.



(6) Reconnect wiring to new switch.

(7) Install new switch in switch housing and secure with bezel nut.

(8) Reinstall switch housing and secure with screws.

(9) Reinstall cable hold down and secure with screw.

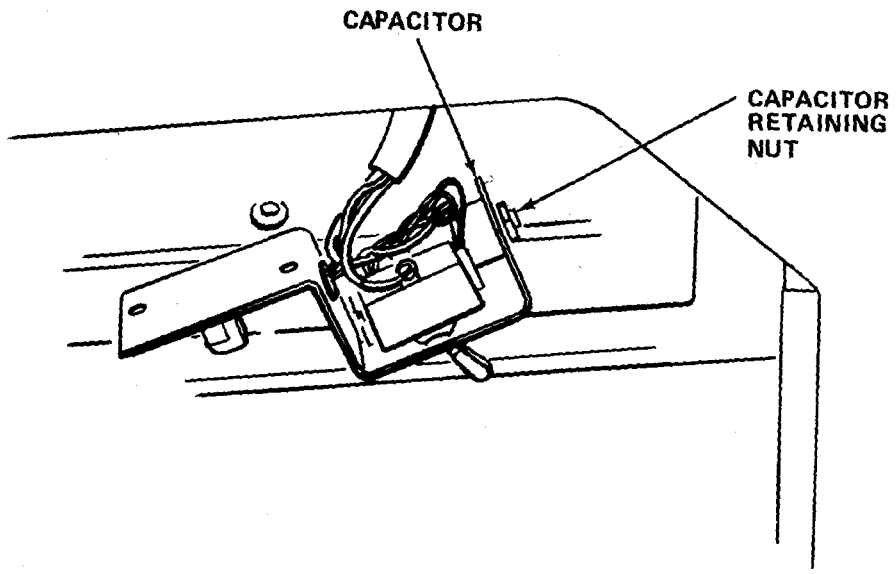
(10) Reinstall fluorescent lamp.

(11) Place operator key back into safety lock.

c. To replace capacitor, proceed as follows:

(1) Remove toggle switch. Perform steps b(1) through b(4).

(2) Tag and disconnect capacitor wires from switch.



(3) Remove capacitor retaining nut and defective capacitor.

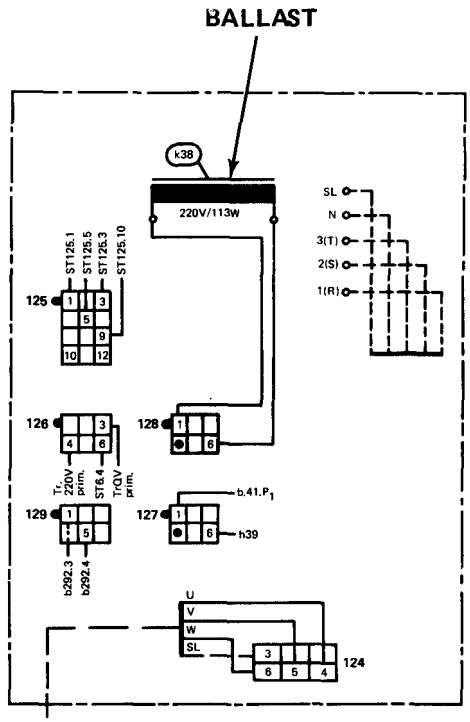
(4) Install new capacitor and secure with retaining nut.

(5) Reconnect wiring to switch.

(6) Reinstall toggle switch. See steps b(7) through b(11).

d. To replace lamp ballast, proceed as follows:

(1) Remove left pillar cover.



(2) Remove ballast mounting bolts from back of HP circuit board.

(3) Tag and disconnect wires from defective ballast.

(4) Reconnect wires to new ballast.

(5) Install new ballast onto back of HP circuit board and secure with mounting bolts.

(6) Reinstall left pillar cover.

(7) Place operator key back into safety lock.

5-16.22 Adjust Backgauge.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 2.5 mm Hex Head Key Wrench
4 mm Hex Head Key Wrench
6 mm Hex Head Key Wrench

SUPPLIES: Ream of paper approximately 5 cm (2 in.) in height, 76.2 cm (30 in.) in length, and 40 cm (10 in.) in width

a. Turn on circuit breaker.

b. Using operator key, unlock safety lock.

c. Turn on power.

(1) Turn main power switch to I position.

(2) Press control power on switch.

NOTE

Ream of paper must be even on all sides.

WARNING

- Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.
- Always keep the largest area of the material being cut behind the knife. If the larger area is in front of the knife, it could fly up and serious injury may occur.

d. Place ream of paper onto cutting table and position backgauge so that approximately 0.20 cm (1/2 in.) of paper will be cut.

e. Be sure the paper is fitted tightly against backgauge.

f. Lower clamp using clamp foot pedal.

g. Pressing both cutting buttons, cut paper.

h. Release clamp foot pedal and raise clamp.

i. Take half of cut ream (under clamp) and turn it 180 degrees.

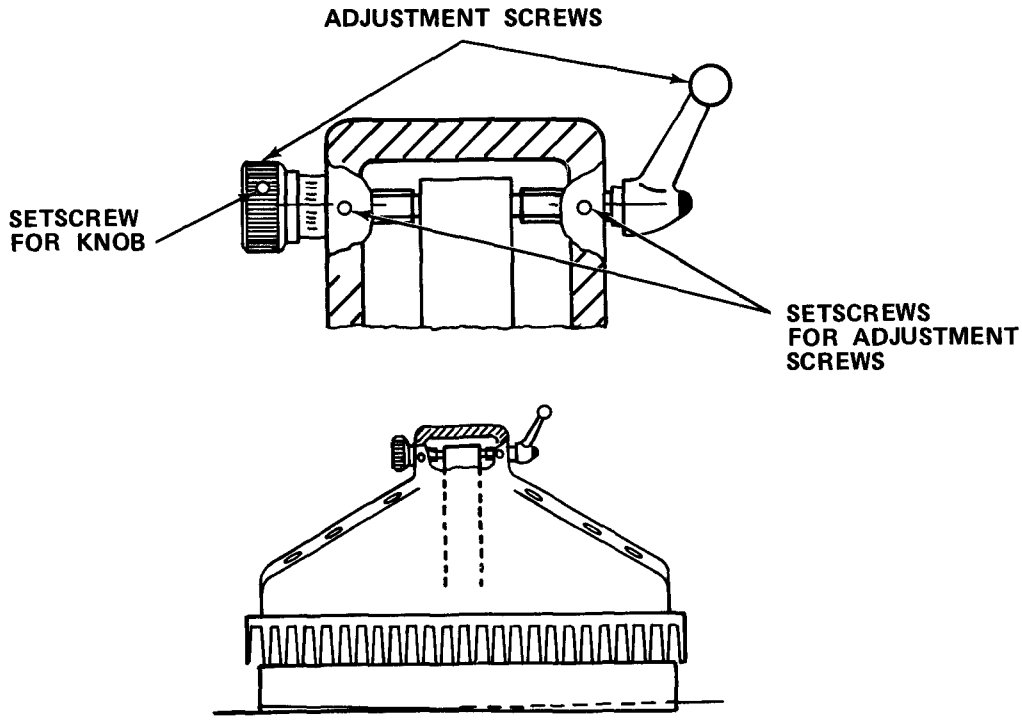
j. Place material on top of the remaining half in the machine making sure both materials are resting accurately and tightly against the back-gauge.

NOTE

The side on which the lower half of the ream is wider than the top half is the side that the adjustment screw must be turned to the right. However, the opposite screw always has to be turned back the same amount.

k. Loosen set screws on adjustment screws.

l. Adjust screws as necessary.



m. Repeat steps d. through l. until properly adjusted.

n. Secure adjusting screws by tightening setscrews.

o. Loosen setscrew on adjustment screw knob.

p. Rotate knob so that zero marking is alined with ▽ mark on the backgauge.

q. Tighten setscrew on adjustment knob.

r. Position adjustment screw handle up to prevent it from coming in contact with back ledge of table by pulling it outward and rotating to the left.

s. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock the safety lock.

t. Turn off the circuit breaker.

5-16.23 Adjust Sledge Guides.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 4 mm Hex Head Key Wrench
13 mm Combination Wrench

WARNING

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

a. Turn on power.

(1) Using operator key, unlock safety lock.

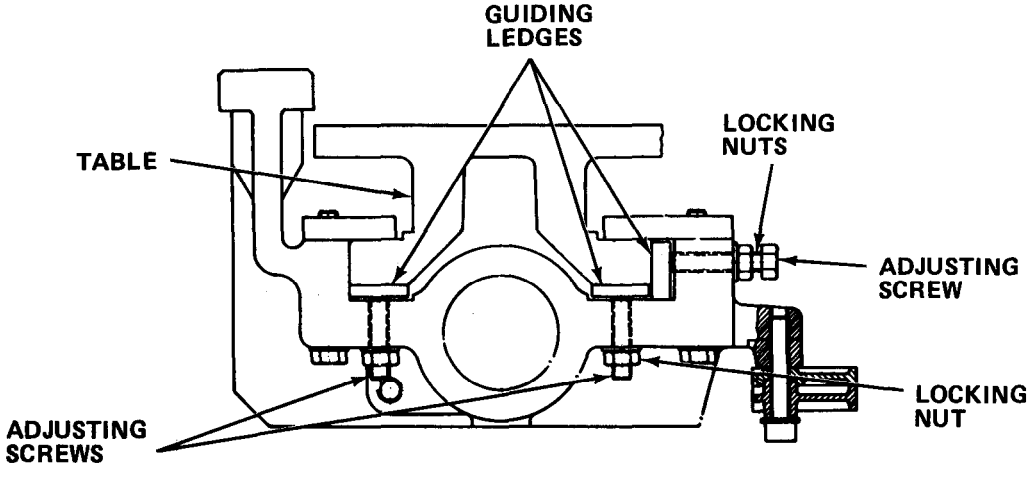
(2) Turn main power switch to I position.

(3) Press control power on switch.

WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

b. To adjust up and down looseness, loosen locking nuts on bottom adjusting screws and adjust screws until free and easy movement without play is obtained.



c. To adjust side to side looseness, loosen locking nuts on side adjusting screws and adjust screws until free and easy movement without play is obtained.

d. Turn main power switch to 0 position.

5-16.24 Adjust Table Stop Bolts and Limit Switches.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS: 17 mm Combination Wrench
Flat Tip Screwdriver
6 mm Hex Head Key Wrench

SUPPLIES: None

a. Turn on circuit breaker.

b. Using operator key, unlock safety lock.

c. Turn on power.

(1) Turn main power switch to I position.

(2) Press control power on switch.

NOTE

- Be sure the OMI is adjusted correctly (paragraph 5-6.1f).
- It will be necessary to manually move the backgauge using the backgauge control knob to position tha backgauge to the stops.

d. Position the backgauge to 36-3/4 in.

WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

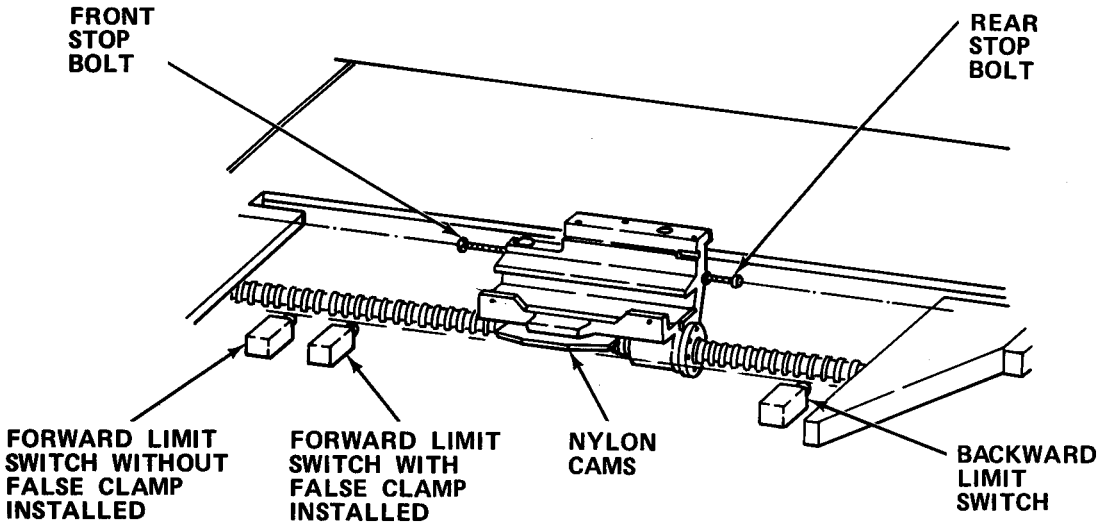
e. Remove oil drip pans under the table spindle.

NOTE

It may be necessary to move the backgauge forward in order to adjust the stop bolt.

f. Loosen locknut and adjust rear stop bolt to proper setting.

g. Repeat steps d. through f. until proper adjustment is obtained.



h. Tighten locknut.

i. Position the backgauge to 3/4 in.

NOTE

It may be necessary to move the backgauge back in order to adjust the stop bolt.

j. Loosen locknut and adjust front stop bolt to proper setting.

k. Repeat steps i. and j. until proper adjustment is obtained.

l. Tighten locknut.

NOTE

Adjust limit switches to the following specifications:

Backward limit switch (b13)	36-1/4 in.
Forward limit switch with false clamp installed (b8)	3-1/2 in.
Forward limit switch without false clamp installed (b9)	1 in.

m. Move the backgauge either forward or backward (depending on what switch you are adjusting) until it stops automatically. (Do not manually position backgauge.)

n. Note the position on the measurement display.

o. Move the backgauge away from the limit switch.

NOTE

It may be necessary to adjust the nylon cams to obtain proper adjustment. To adjust cams, loosen two hex head bolts. Use care to only move the cam you are adjusting.

p. Adjust the limit switch by loosening two screws at the front of the switch and move the switch in (to stop sooner) or out (to stop later).

q. Repeat steps m. through p. until proper adjustment is obtained.

r. Repeat steps m. through q. for remaining limit switches.

s. Reinstall oil drip pans.

t. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock the safety lock.

(3) Turn off the circuit breaker.

5-16.25 Adjust Backgauge Angle.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 19 mm Open End Wrench

SUPPLIES: Paper

a. Turn on circuit breaker.

b. Using operator key, unlock safety lock.

c. Turn on power.

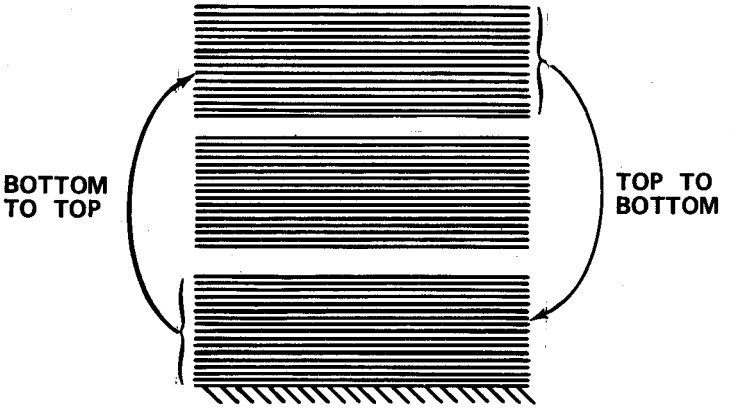
(1) Turn main power switch to I position.

(2) Press control power on switch.

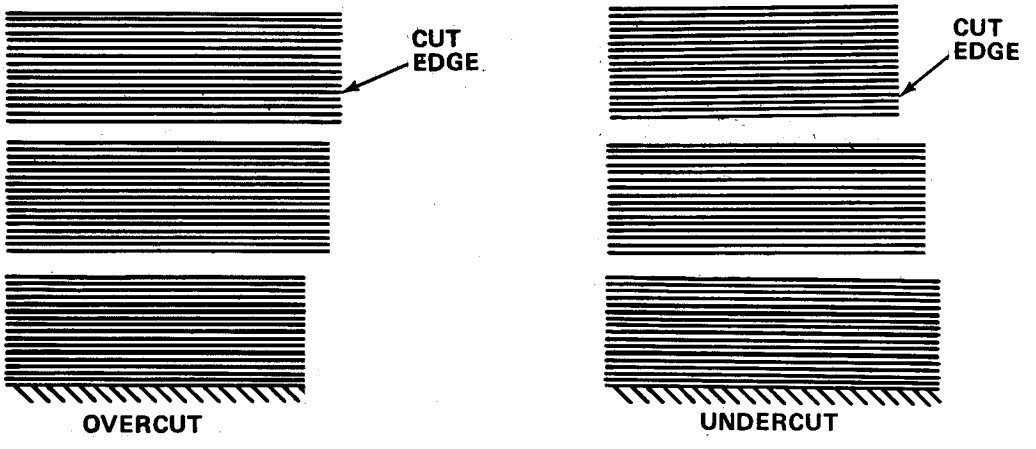
d. Place a stack of paper approximately 29-1/2 in. x 22 in. and 3 in. in height under the clamp. Position the backgauge so that 1/4 in. will be cut off the paper. Cut the paper.

e. Turn the paper 180 degrees and again trim 1/4 in. off the stack.

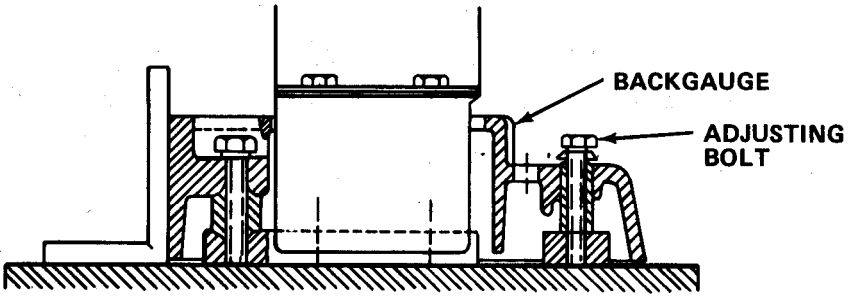
f. Jog the stack of paper tightly against the backgauge rakes. Perform another cut, this time cutting off two inches of paper.



g. Remove 3/4 in. of paper from the top and bottom of the stack. Place the top of stack on the bottom and the bottom on the top.



h. Jog the paper evenly and determine if an overcut or undercut exists.



i. If an overcut exists, loosen the adjusting bolts on the backgauge; if an undercut exists, tighten the adjusting bolt.

j. Repeat steps d. through i. until problem is corrected.

k. Turn off power.

(1) Turn main power switch to 0 position.

(2) Using operator key, lock the safety lock.

5-16.26 Adjust Clamp Connecting Rod.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS: Flat Tip Screwdriver
10 mm Combination Wrench
46 mm Open End Wrench (2 ea)
6 in. Steel Machinist Rule

WARNING

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

a. Turn off power.

(1) Turn main power switch to 0 position.

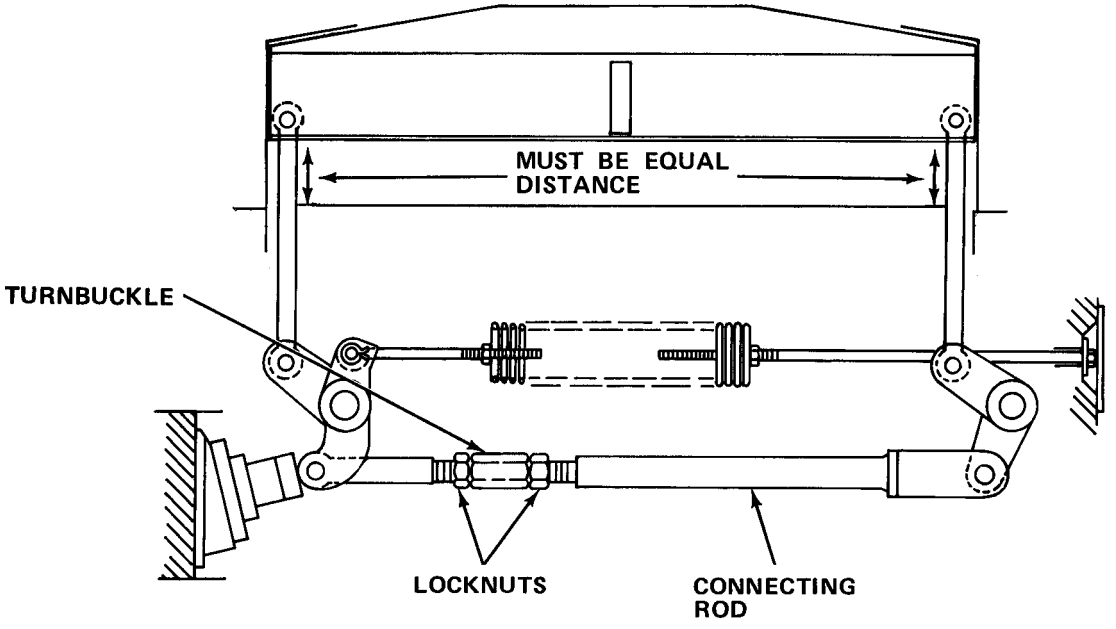
(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove rear electronics enclosure cover.

c. Remove wire box cover.

d. Remove bolts securing wire box brackets to frame.

e. Take care that wires are not disconnected from motherboard. Lower box to allow access to turnbuckle.



f. Loosen turnbuckle locknuts.

g. Adjust turnbuckle so that both edges of the clamp are the same distance from table top.

h. Tighten turnbuckle locknuts.

i. Reinstall wire box brackets and cover.

j. Reinstall lower back cover panel.

k. Place operator key back into safety lock.

5-16.27 Manually Move Knife Carrier.

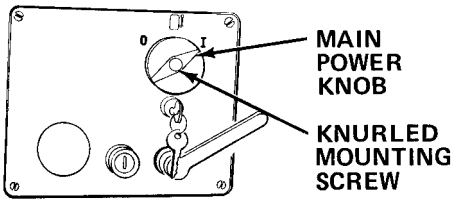
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Reset Handles
Flat Tip Screwdrivers

WARNING

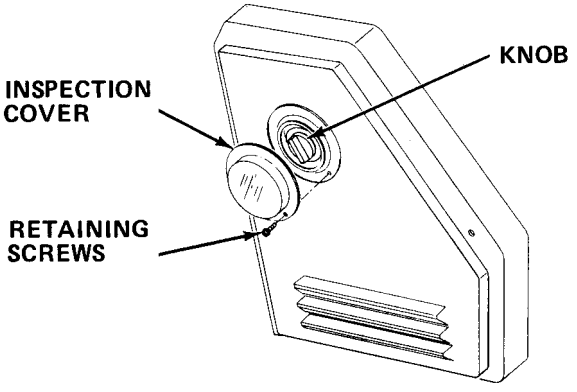
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn main power switch to 0 position.



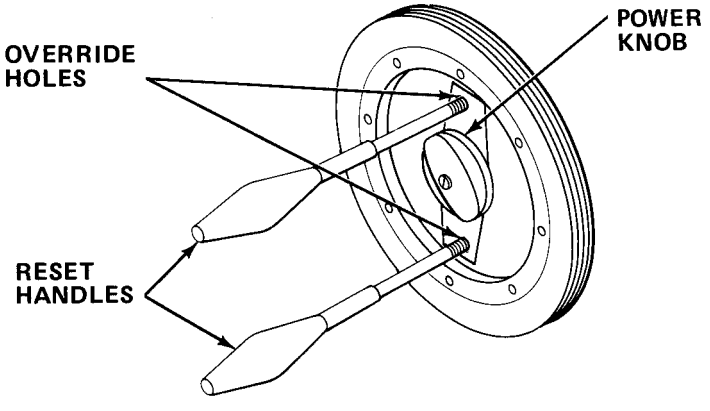
b. Remove main power switch knob.

c. Remove main drive gear clutch inspection cover.

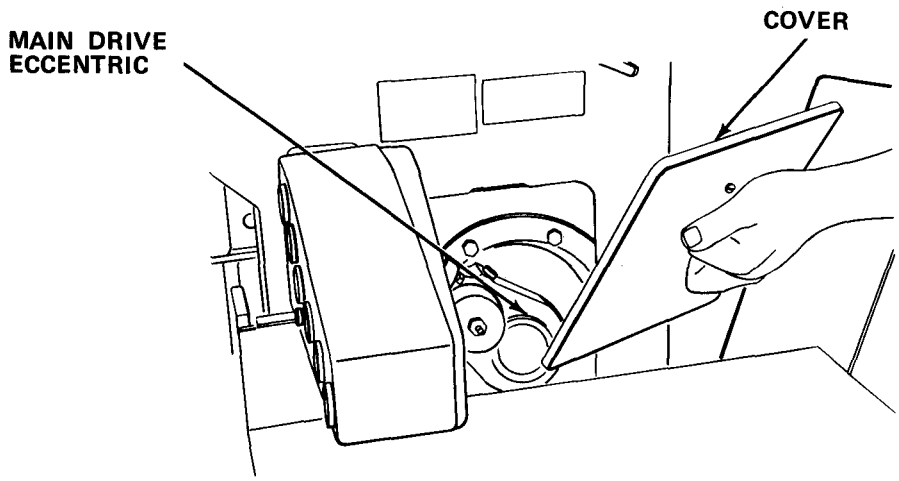


d. Install main power switch knob onto shaft of clutch plate.

e. Rotate knob to the right to uncover the clutch override holes.



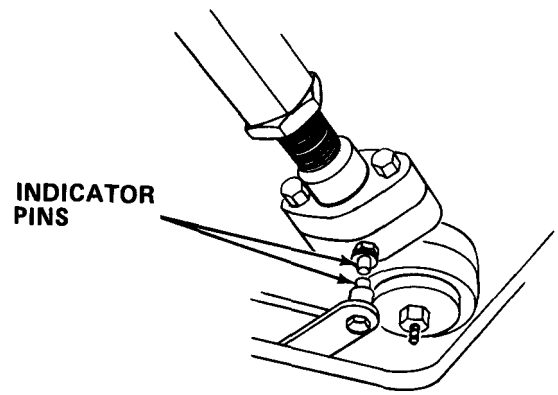
f. Insert the reset handles into the override holes and rotate to the right until the threads engage. Tighten handles.



g . Remove eccentric cover.

NOTE

- Carrier must be all the way up or cut cannot be performed.
- It may be necessary to remove the safety bolt cover and hold the safety bolt back to move the knife through all of its movement.



h. Rotate handles and main drive gear to the right until the carrier is in its uppermost position (connecting rod and eccentric are alined).

i. Remove reset handles.

j. Rotate clutch plate to the left to cover the override holes.

k. Remove main power switch knob and reinstall onto control panel.

l. Reinstall main drive gear clutch cover.

m. Reinstall eccentric cover.

5-17. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section V DIRECT/GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

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 5-3610-253-24P 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.

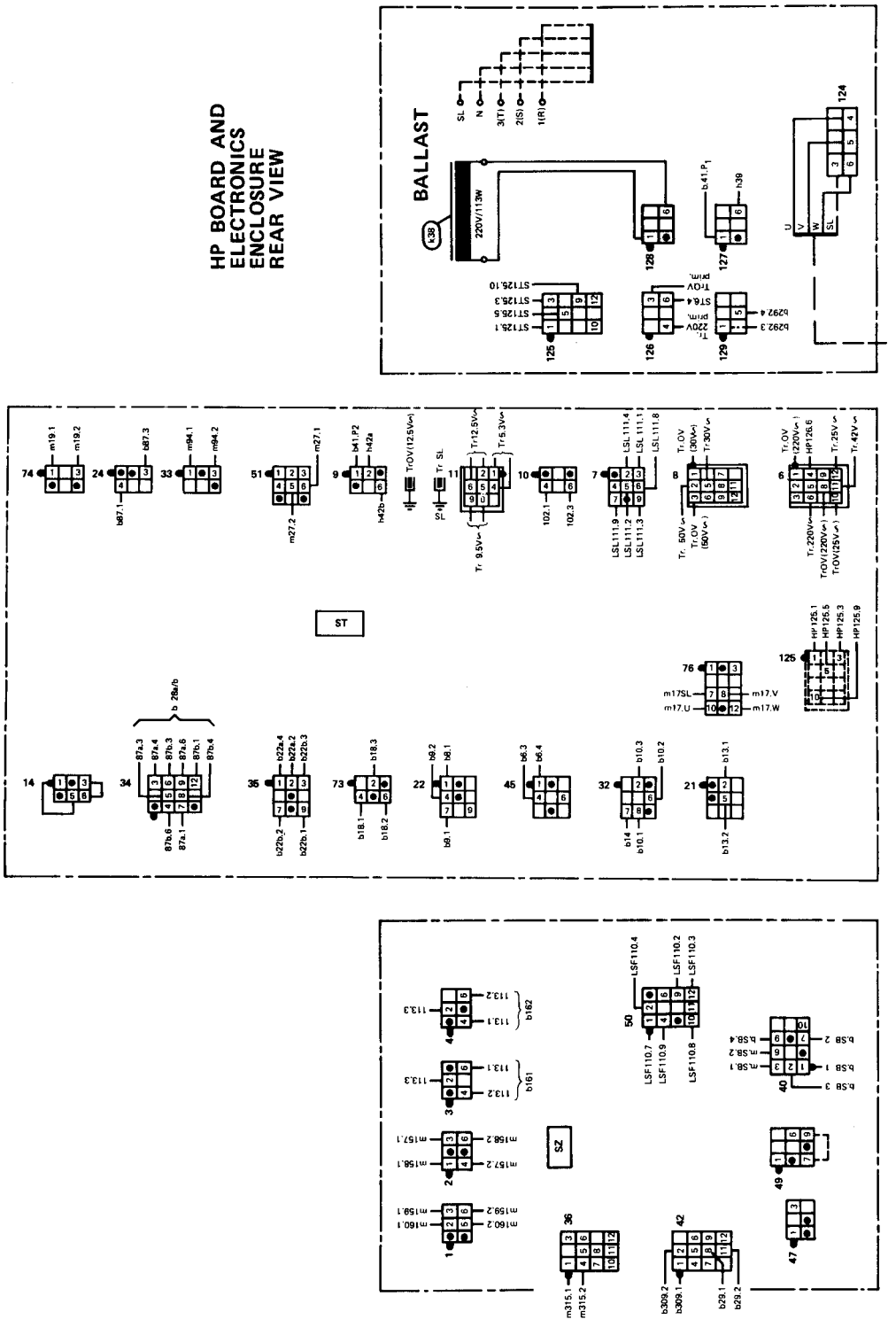
b. For unidentified malfunctions, use the following schematics and/or the foldouts located at the end of this manual for further fault analysis.

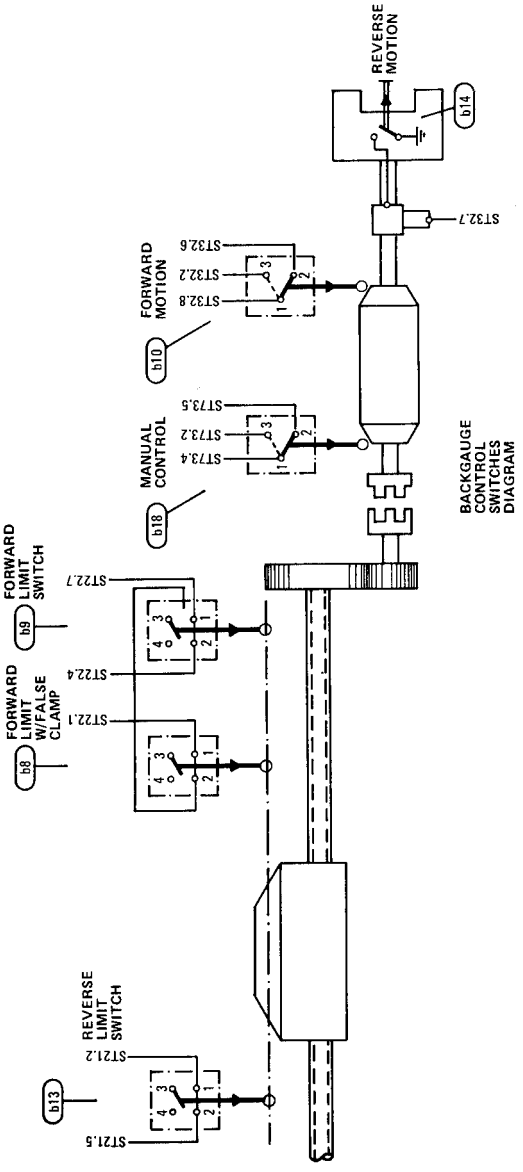
c. Prior to using the troubleshooting procedures for electrical malfunctions, always check plug connections and fuses.

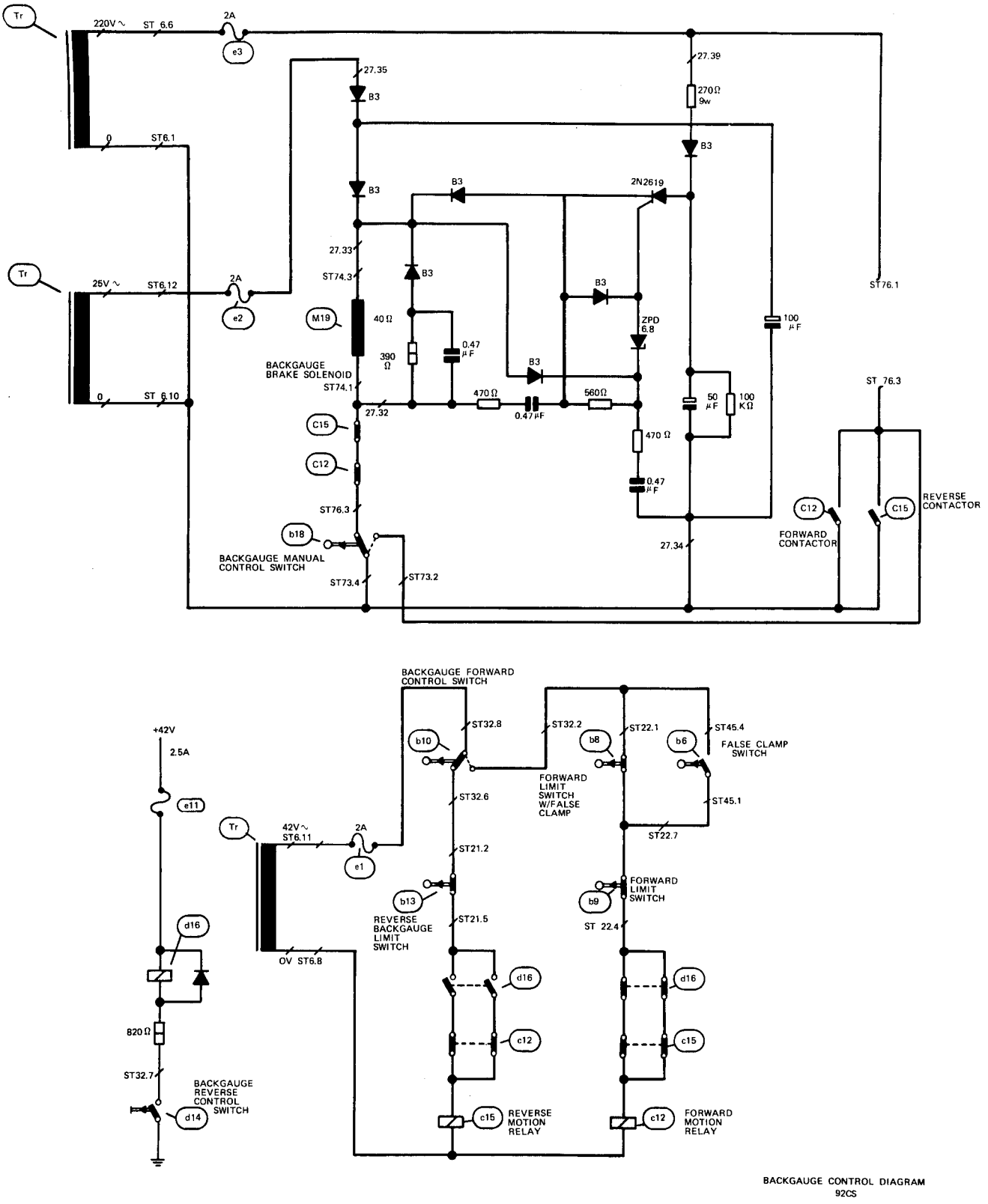
d. Prior to using the troubleshooting procedures for hydraulic malfunctions, always check for loose or leaky pipe connections or possible air in the hydraulic system.

NOTE

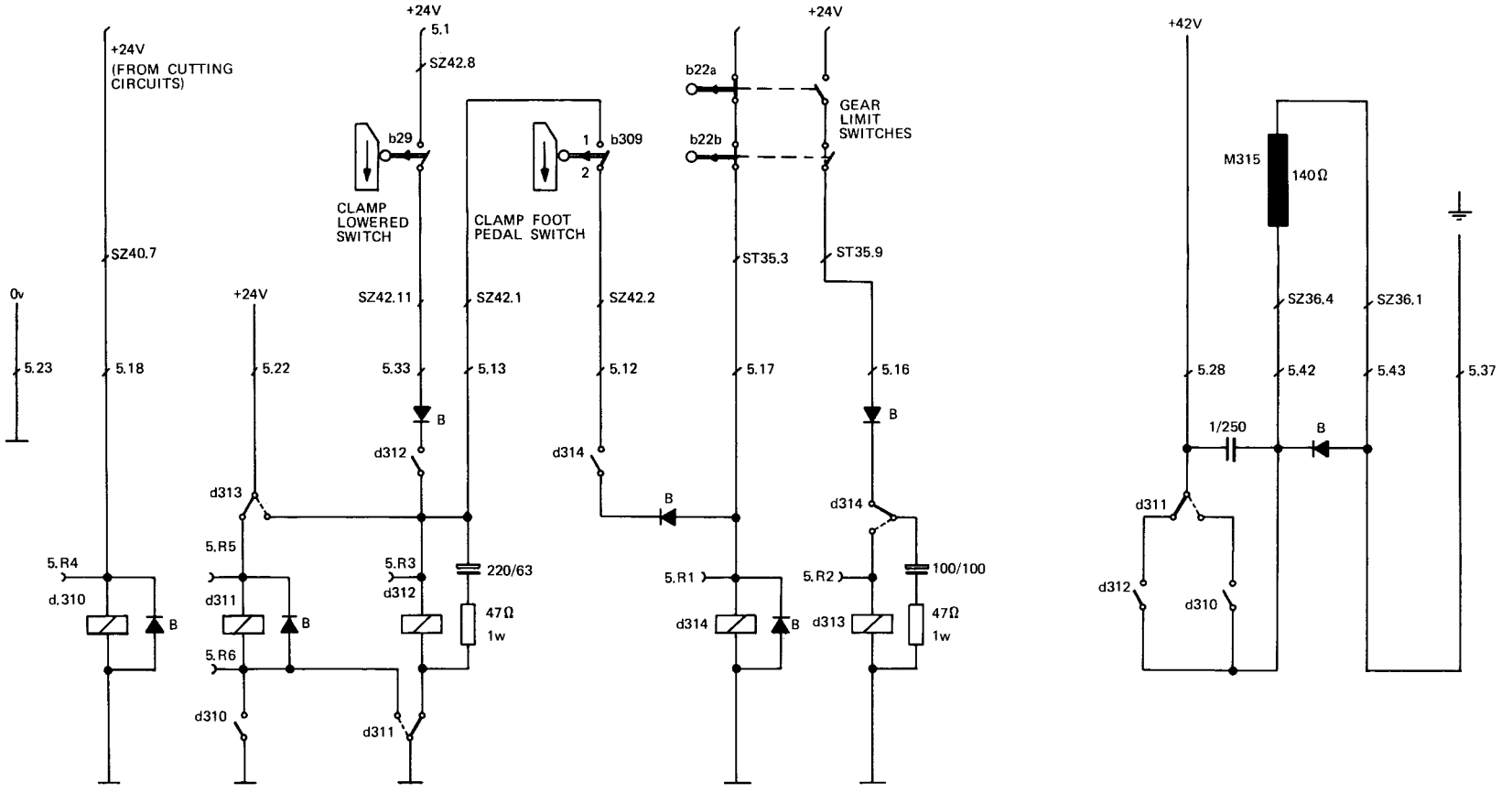
Sufficient data is not available for you to test or troubleshoot printed circuit boards. When associated wiring, ribbon cables, power cords and other related electrical components have been eliminated as possible faults, then the printed circuit boards must be substituted, one for one, until the fault is isolated.




REVERSE MOTION
b14
ST32.7
FORWARD MOTION
ST32.6
ST32.2
ST32.8
b10
MANUAL CONTROL
ST73.5
ST73.2
ST73.4
b18
BACKGAUGE CONTROL SWITCHES DIAGRAM
FORWARD LIMIT SWITCH
b9
ST22.7
FORWARD LIMIT W/FALSE CLAMP
b8
ST22.4
ST22.1
REVERSE LIMIT SWITCH
b13
ST21.2
ST21.5



BACKGAUGE CONTROL DIAGRAM
92CS



CLAMP BALL VALVE CONTROL DIAGRAM (CONICAL)
92CS

SYMPTOM INDEX

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING

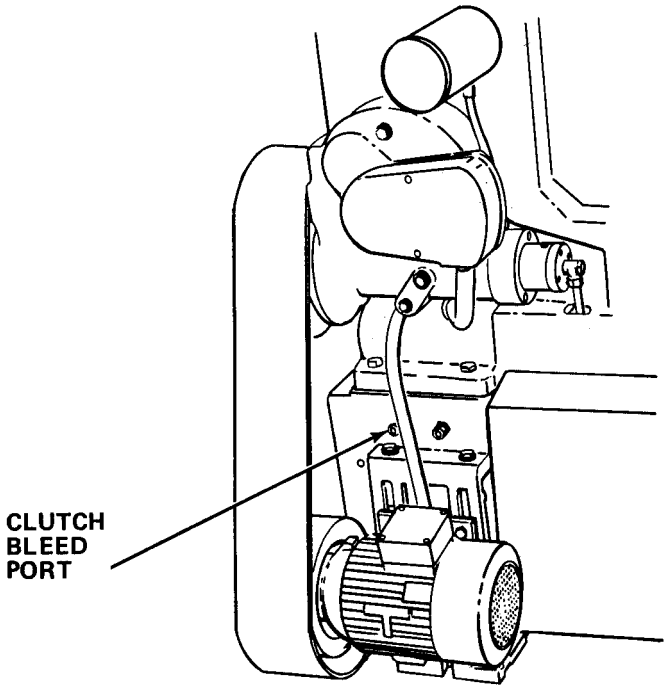
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

1. MACHINE DOES NOT CUT THROUGH MATERIAL.

Check clutch pressure as follows:

a. Using operator key, unlock safety lock, turn main power switch to I position and allow paper cutter to run for 30 minutes to stabilize hydraulic fluid temperature.

b. Turn main power switch to 0 position.



c. Remove bleed cap from clutch bleed port and connect manometer to port.

NOTE

Clutch pressure can only be measured during cut.

d. Turn main power switch to I position.

e. Press control power on switch.

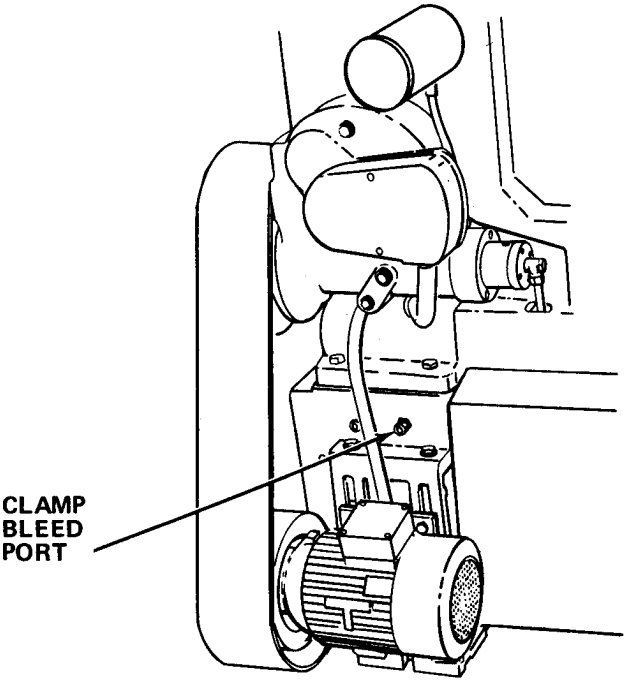
Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
1. MACHINE DOES NOT CUT THROUGH MATERIAL - Cont	
f. Perform cut and observe clutch pressure at bleed port. Pressure should be 65 bar.	(a) If clutch pressure is incorrect, adjust clutch pressure regulator on control block as necessary (paragraph 5-20.21). (b) If correct pressure cannot be obtained, replace control block (paragraph 5-20.2). (c) If clamping pressure is also being affected, replace hydraulic pump (paragraph 5-20.5).
2. KNIFE PULLS SHEETS OUT FROM UNDER CLAMP DURING CUT.	
Check clearance between knife carrier and clamp (paragraph 5-20.1).	(a) If clearance is incorrect, adjust cl amp guiding (paragraph 5-20.22). (b) If clearance is correct, troubleshoot in accordance with malfunction 4.
3. KNIFE CARRIER RUNS AGAINST GUIDING GIBS AT TOP.	
Visually check for bent connecting rod, main drive gear shaft, or bent eccentric bolt.	Replace defective parts as necessary.
4. CLAMP MOVES DOWN TOO SLOWLY DURING CUTTING.	
Check for proper clamping pressure as follows:	
Using operator key, unlock safety lock, turn main power switch to I position and allow paper cutter to run for 30 minutes to stabilize hydraulic fluid temperature.	
b. Turn main power switch to 0 position.	

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

4. CLAMP MOVES DOWN TOO SLOWLY DURING CUTTING - Cont



c. Remove bleed cap from clamp bleed port and connect manometer to port.

d. Turn main power switch to I position.

e. Press control power on switch.

f. Using the foot pedal, lower the clamp and check clamp pressure. Pressure should be 21 bar (298 psi).

g. With minimum setting on clamp pressure adjust pedal, perform a cut checking clamp pressure. Pressure should be 32 bar (455 psi).

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
4. CLAMP MOVES DOWN TOO SLOWLY DURING CUTTING - Cont	
h. With maximum setting on clamp pressure adjust pedal, perform a cut checking clamp pressure. Pressure should be 130 bar (1848 psi).	
	(a) If incorrect pressure(s) are observed, adjust clamp pressure (paragraph 5-20.20).
	(b) If correct pressures cannot be obtained, replace control block (paragraph 5-20.2).
	(c) If malfunction persists, replace pump (paragraph 5-20.5).
5. DURING KNIFE CHANGING, CLAMP MOVES UPWARD AFTER BEING LOWERED WITH PEDAL.	
Check control valve linkage for broken or disconnected parts.	

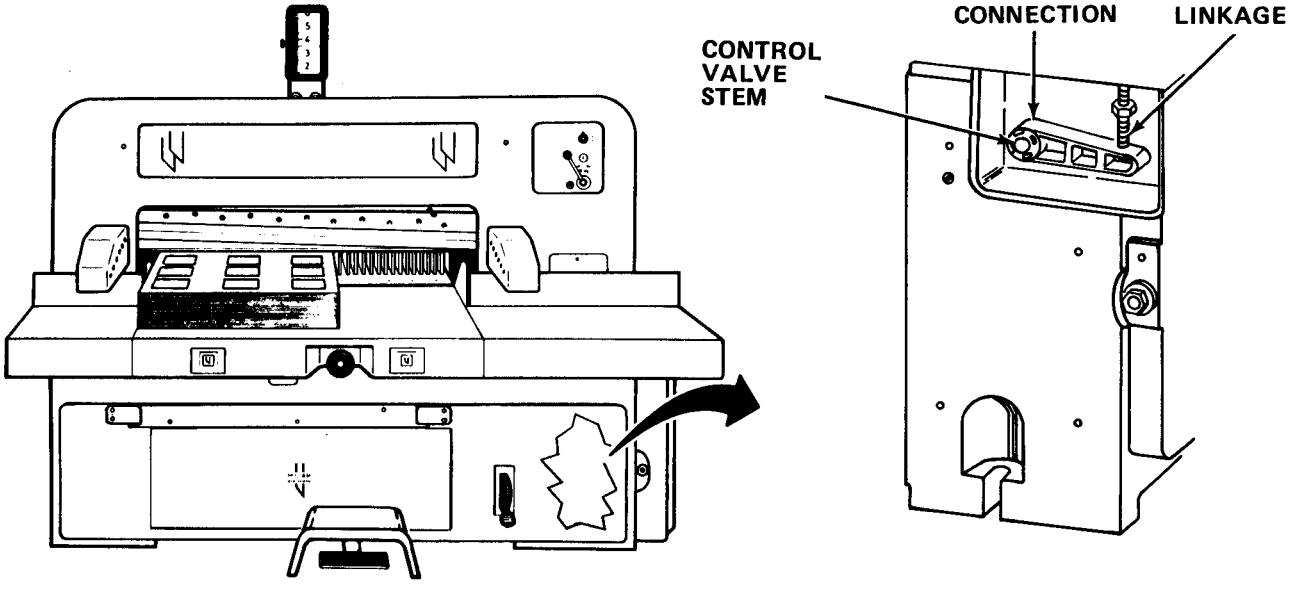
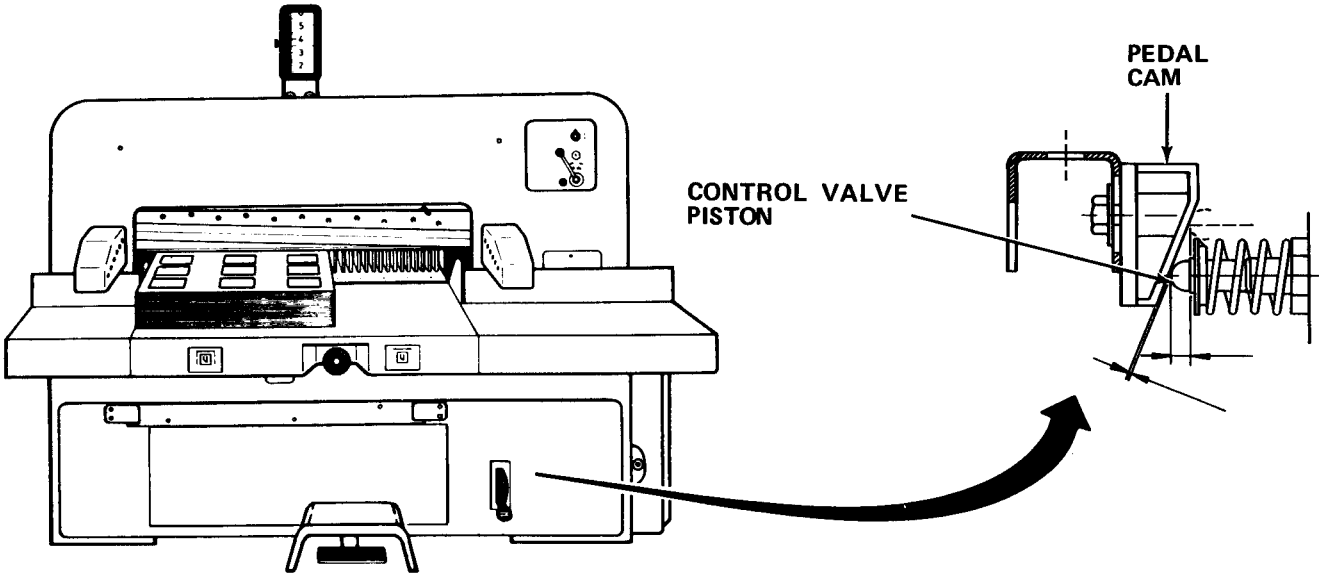


Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
5. DURING KNIFE CHANGING, CLAMP MOVES UPWARD AFTER BEING LOWERED WITH PEDAL - Cont	
	(a) Repair or replace linkage as necessary.
	(b) If linkage is not broken or disconnected, replace control valve (paragraph 5-20.3).
6. ROUGH FOOT PEDAL MOVEMENT.	
Check clamp control valve piston for free movement when pressed.	



	(a) If piston binds, replace control block (paragraph 5-20.2).
	(b) If piston does not bind, free up control bar.

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

7. HYDRAULIC SYSTEM IS NOISY DURING OPERATION.

Step 1. Check for air in system.

(a) Bleed air from system (paragraph 5-20.23).

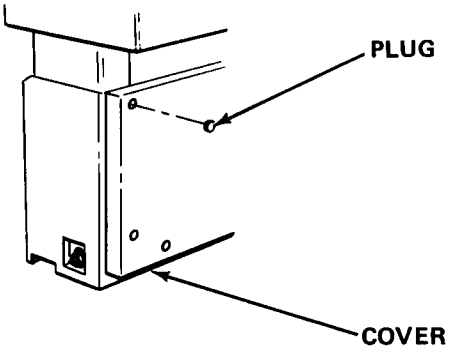
(b) If malfunction persists, replace pump (paragraph 5-20.5).

8. PAPER CUTTER POWER SWITCH ON, MAIN MOTOR STARTS, ALL OTHER FUNCTIONS INOPERATIVE.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

Step 1. Check main circuit breakers on PC card HP as follows:



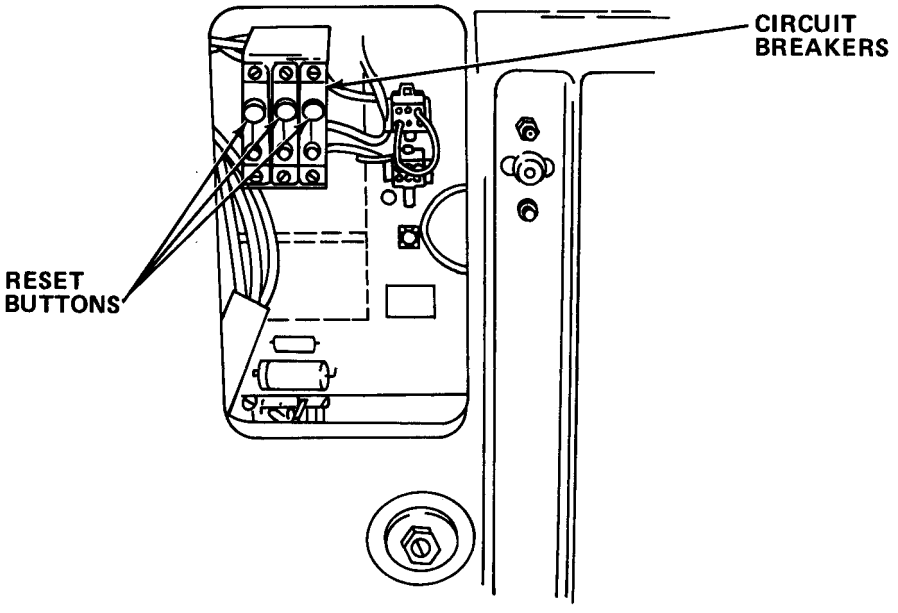
a. Remove plastic plugs covering screw holes on HP card cover panel.

b. Remove mounting screws and panel. Turn main power switch off (0).

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

8. PAPER CUTTER POWER SWITCH ON, MAIN MOTOR STARTS, ALL OTHER FUNCTIONS INOPERATIVE - Cont



c. Press reset buttons on three main circuit breakers.

(a) If circuit breakers repeatedly trip, use schematic diagram and troubleshoot system for short circuits.

(b) If circuit breakers do not trip and malfunction persists, proceed to step 2.

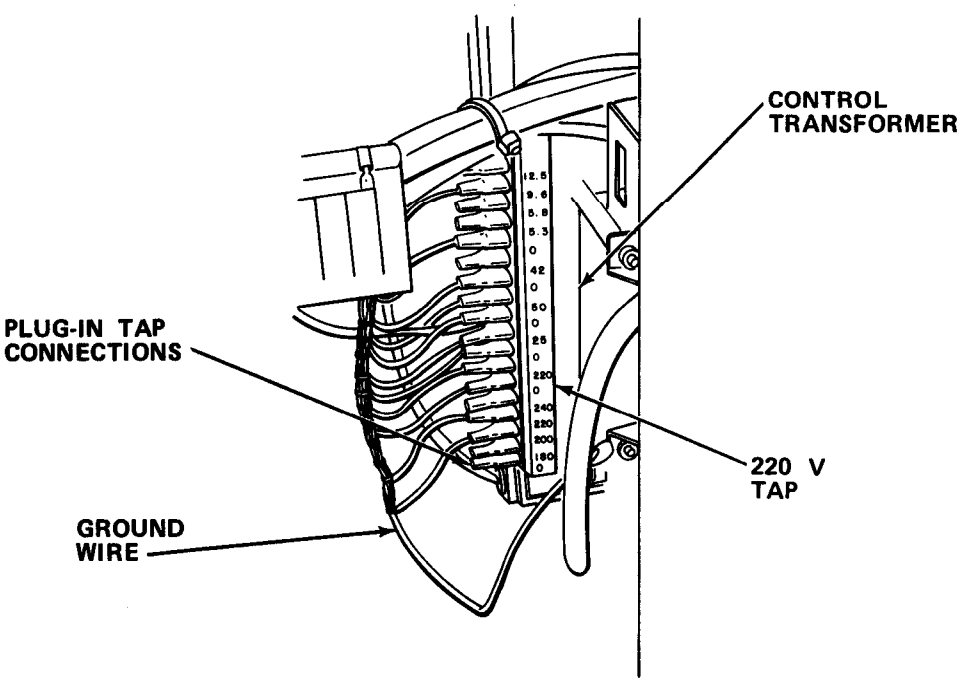
Step 2. Check for 120 V ac at input of circuit breakers.

(a) If voltage is incorrect, replace main power switch (paragraph 5-16.15).

(b) If voltage is correct, proceed to step 3.

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
8. PAPER CUTTER POWER SWITCH ON, MAIN MOTOR STARTS, ALL OTHER FUNCTIONS INOPERATIVE - Cont	
Step 3. Check for 120 V ac at output of circuit breakers.	(a) If voltage is incorrect, replace circuit breaker (paragraph 5-20.24). (b) If voltage is correct, proceed to step 4.
Step 4. Check for 220 V ac at input taps.	



	(a) If voltage is correct, replace control transformer (paragraph 5-20.9). (b) If voltage is correct, proceed to step 5.

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

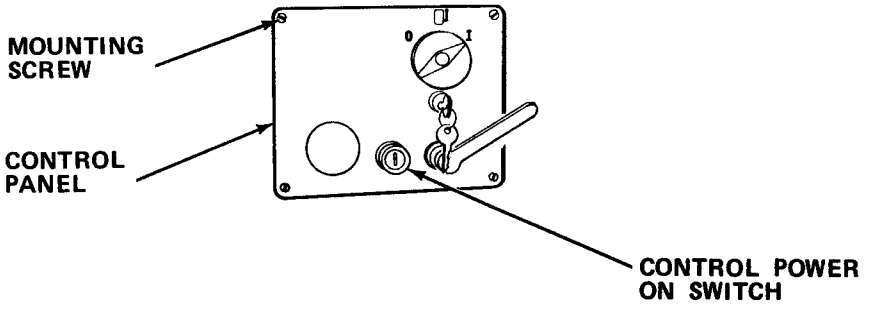
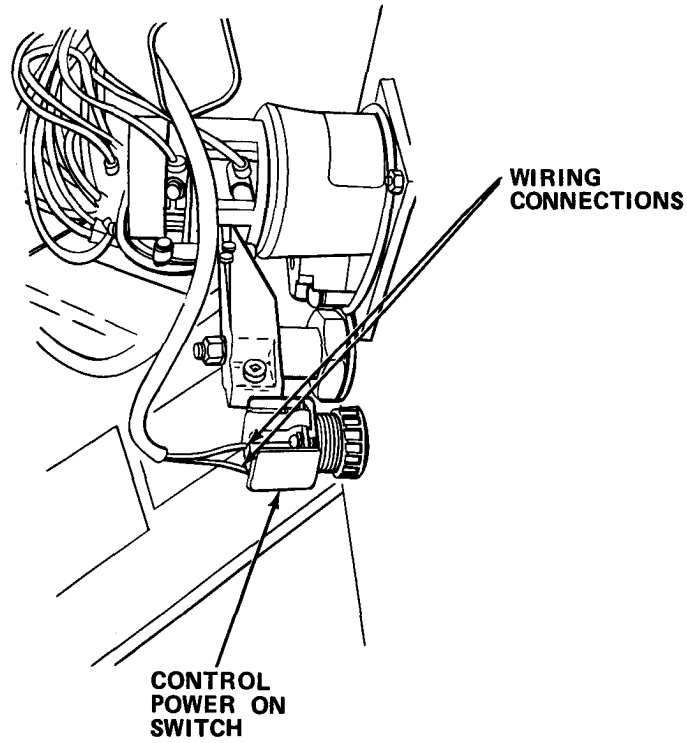
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
8. PAPER CUTTER POWER SWITCH ON, MAIN MOTOR STARTS, ALL OTHER FUNCTIONS INOPERATIVE - Cont	Step 5. Check operation of control power on switch as follows: **WARNING** Death or serious injury may occur from electrical shock unless power is turned off before servicing. a. Turn main power switch off. b. Turn off circuit breaker.  c. Remove control panel. **CAUTION** Panel is connected to inside of paper cutter via rod attached to knife change lever. Panel cannot be pulled away more than a few inches, without damaging the panel. d. Carefully pull panel a few inches out from paper cutter; then turn it until control power on switch is accessible.	

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
8. PAPER CUTTER POWER SWITCH ON, MAIN MOTOR STARTS, ALL OTHER FUNCTIONS INOPERATIVE - Cont		



e. Remove shrink tubing from switch.

f. With switch held down, check for continuity across terminals 3 and 4.

(a) If continuity does not exist, replace switch (paragraph 5-16.15).

(b) If continuity exists, replace PC card HP (paragraph 5-20.10).

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
9. WHEN USING THE FOOT PEDAL, THE CLAMP DOES NOT OPERATE AT ALL.
Step 1. Check for 140 ohms between pins 4 and 1 of plug connector SZ 36.
(a) If 140 ohms is not present, replace control block (paragraph 5-20.2).
(b) If correct, proceed to step 2.
Step 2. Check for a short between test point G1 on PC ST and pin 3 of plug connector ST 35.
(a) If correct, proceed to step 6.
(b) If incorrect, proceed to step 3.
Step 3. Check for a short between test point G1 on PC ST and pin 5 of plug connector SZ 15.
(a) If correct, check continuity of gear limit switches and replace defective gear limit switch (paragraph 5-15.18).
(b) If incorrect, proceed to step 4.
Step 4. Check for a short between pin 10 of plug connector ST 15 and test point G1 on ST PC card.
(a) If correct, replace PC card 9 (paragraph 5-20. 11).
(b) If incorrect, proceed to step 5.
Step 5. Check for a short between test point G1 on ST PC and pin 12 of plug connector ST 34.
(a) If correct, check continuity of cutting buttons and replace defective cutting button (paragraph 5-16.16).
(b) If incorrect, replace ST PC motherboard (paragraph 5-20.12).

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
9. WHEN USING THE FOOT PEDAL, THE CLAMP DOES NOT OPERATE AT ALL - Cont	
Step 6. Check for a short between pins 1 and 2 of plug connector SZ 42 when the foot pedal is depressed and an open circuit when the foot pedal is released.	(a) If incorrect, replace clamp foot pedal switch (paragraph 5-16.12). (b) If correct, replace PC card 5 (paragraph 5-20.11). (c) If problem persists, refer to electronic schematics and troubleshoot.
10. CLAMP DOES NOT OPERATE WHEN CUTTING BUTTONS ARE DEPRESSED.	
With cutting buttons depressed, check for +24 V at pin 7 on plug connector SZ 40. Use plug connector ST 70 pin 5 as ground.	(a) If present, replace PC card 5 (paragraph 5-20.11). (b) If missing, refer to malfunction 11 and troubleshoot.
11. WITH CUTTING BUTTONS DEPRESSED, CUTTING AND CLAMPING ARE INOPERATIVE, LIGHT BARRIER SIGNAL LAMP IS LIT.	
Step 1. Check that the light barrier goes off momentarily and then comes back on.	(a) If correct, proceed to step 6. (b) If incorrect, proceed to step 2.
Step 2. Check for +24 V at pin 8 of plug connector SZ 15 with both cutting buttons depressed. Use plug connector ST 70 pin 5 as ground.	(a) If correct, replace PC card 9 (paragraph 5-20.11). (b) If +24 V is missing, proceed to step 3.

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

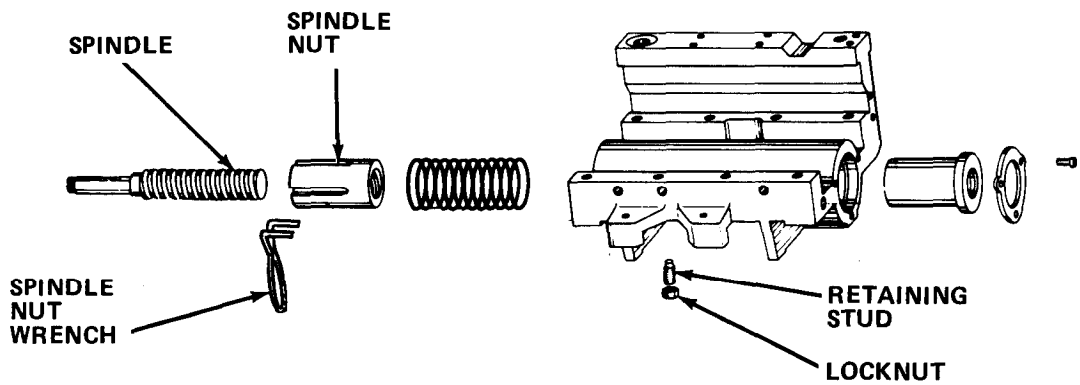
MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
11. WITH CUTTING BUTTONS DEPRESSED, CUTTING AND CLAMPING ARE INOPERATIVE, LIGHT BARRIER SIGNAL LAMP IS LIT - Cont	
Step 3. Check for +24 V at pin 9 of plug connector ST 18 with both cutting buttons depressed, using pin 5 of plug connector ST 70 as ground.	(a) If correct, replace PC card FZ. (b) If +24 V is missing, proceed to step 4.
Step 4. Check for +24 V at test point G1 on ST motherboard, using pin 5 of plug connector ST 70 as ground.	(a) If +24 V is present, check continuity of contractors C15 and C12 and replace defective contactor. (b) If +24 V is missing, proceed to step 5.
Step 5. Check for 30 V ac input to fuse e4.	(a) If voltage is present, replace ST motherboard (paragraph 5-20.12). (b) If 30 V ac is missing, replace control transformer (paragraph 5-20.9).
Step 6. Check for zero volts dc at test receptacle 9R1 on PC card 9 after cutting buttons are depressed.	(a) If voltage is present, replace PC card 9 (paragraph 5-20. 11). (b) If zero volts dc are present, proceed to step 7.
Step 7. Check for +24 V at pin 7 of plug connector SZ 40 when cutting buttons are depressed. Use pin 5 of plug connector ST 70 as ground.	(a) If voltage is missing, replace PC card 9 (paragraph 5-20.11). (b) If voltage is present, proceed to step 8.

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
11. WITH CUTTING BUTTONS DEPRESSED, CUTTING AND CLAMPING ARE INOPERATIVE, LIGHT BARRIER SIGNAL LAMP IS LIT - Cont	
Step 8. Check for +42 V at pin 5 of plug connector ST 51 with cutting buttons depressed.	(a) If voltage is present, replace control block (paragraph 5-20.2). (b) If voltage is not present, proceed to step 9.
Step 9. Check for +42 V at pin 5 of plug connector ST 14 with cutting buttons depressed.	(a) If voltage is present, replace PC card 27 (paragraph 5-20.11). (b) If voltage is not present, proceed to step 10.
Step 10. Check for +42 V at pin 4 of plug connector ST 56.	(a) If voltage is present, proceed to step 12. (b) If voltage is not present, proceed to step 11.
Step 11. Check for 50 V ac input to fuse e5.	(a) If present, replace PC motherboard ST (paragraph 5-20.12). (b) If voltage is not present, replace control transformer (paragraph 5-20.9).
Step 12. Check for +24 V at pin 2 of plug connector SZ 40 when cutting buttons are depressed. Use pin 5 of plug connector ST 70 as ground.	(a) If voltage is missing, replace PC card 7SB (paragraph 5-20.9). (b) If voltage is present, proceed to step 13.

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
11. WITH CUTTING BUTTONS DEPRESSED, CUTTING AND CLAMPING ARE INOPERATIVE, LIGHT BARRIER SIGNAL LAMP IS LIT - Cont	
Step 13. Check for +24 V at pin 9 of plug connector SZ 40 when cutting buttons are depressed. Use pin 5 of plug connector ST 70 as ground.	(a) If voltage is present, replace motherboard SZ (paragraph 5-20.12). (b) If voltage is not present, replace safety bolt assembly after checking continuity of safety bolt proximity switch (paragraph 5-16.17). (c) If problem still remains, refer to electronic schematics and troubleshoot.
12. BASIC OMI MEASUREMENT VARIES FROM CUT TO CUT.	
Step 1. Check for loose spindle nut by observing to see if sledge is loose on spindle.	(a) If loose, tighten spindle nut as follows:



(1) Loosen locknut and remove retaining stud from carrier.

(2) Tighten spindle nut with spindle nut wrench until snug against spindle flats. Reinstall retaining stud. Tighten firmly and lock with nut.

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
12. BASIC OMI MEASUREMENT VARIES FROM CUT TO CUT - Cont
(b) If malfunction persists, proceed to step 2.
Step 2. Check for worn or damaged backgauge brake:
a. Turn main power switch off (0).
b. Press backgauge control knob in and observe if backgauge can be moved manually.
(a) If brake is worn or damaged, replace backgauge brake pads (paragraph 5-20.13).
(b) If malfunction persists, proceed to step 3.
Step 3. Check for worn table guiding ledges.
Replace paper cutter (paragraph 5-20.18).
13. BACKGAUGE DOES NOT OPERATE ELECTRICALLY IN THE FORWARD DIRECTION.
Step 1. Check operation of contactor and relay c12 as follows:
(a) Remove the front electronics cover.
(b) Remove cover to relay c12 on PC card ST. Check that the resistance of the coil is between 804 and 836 ohms.
(1) If resistance is incorrect, replace defective relay.
(2) If resistance is correct, proceed to step 2.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
13. BACKGAUGE DOES NOT OPERATE ELECTRICALLY IN THE FORWARD DIRECTION - Cont
Step 2. Check operation of backgauge control switch b10 as follows:
a. Turn main power switch to I position.
b. Press control power on switch.
c. While pulling the backgauge control knob out, check for 42 V ac at pin 4 of ST 32 connector, pin 2. Use plug connector ST 6 pin 8 as ground.
(a) If voltage is missing, replace backgauge control switch b10 (paragraph 5-20.14).
(b) If voltage is present, proceed to step 3.
Step 3. Check for 42 V ac at plug connector ST 22, pin 7, using plug connector ST 6, pin 8 as ground, while pulling out the backgauge control knob.
(a) If false cl amp is stored, replace false cl amp switch (paragraph 5-20.15).
(b) If false clamp is installed on clamp, replace forward motion limit switch b8 (paragraph 5-16.9).
(c) If voltage is present, proceed to step 4.
Step 4. Check for 42 V ac at plug connector ST 22, pin 4, using plug connector ST 6 pin 8 as ground, while pulling out the backgauge control knob.
(a) If 42 V ac is missing, replace forward motion limit switch b9 (paragraph 5-16.9).
(b) If voltage is present, replace ST motherboard (paragraph 5-20.12).

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
14. BACKGAUGE DOES NOT OPERATE ELECTRICALLY IN THE BACKWARD DIRECTION. Step 1. Check operation of contactor and relay c15 as follows: a. Remove the front electronics enclosure cover. b. Remove cover to relay c15 on PC card ST. Check that the resistance of the coil is between 804 and 836 ohms.	(a) If resistance is incorrect, replace defective relay. (b) If resistance is correct, proceed to step 2.
WARNING Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur. Step 2. Check operation of backgauge control switch b10 as follows: a. Turn main power switch to I position. b. Press control power on switch. c. Check for 42 V ac at plug connector ST 21 pin 2, using plug connector ST 6 pin 8 as ground.	(a) If voltage is missing, replace backgauge control switch b10 (paragraph 5-20.14). (b) If voltage is present, proceed to step 3.
Step 3. Check for 42 V ac at plug connector ST 21, pin 5, using plug connector ST 6 pin 8 as ground.	(a) If voltage is missing, replace backgauge backward motion limit switch b13 (paragraph 5-16.9). (b) If voltage is present, proceed to step 4.

Table 5-9. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
14. BACKGAUGE DOES NOT OPERATE ELECTRICALLY IN THE BACKWARD DIRECTION - Cont	
Step 4. Check for continuity through switch b14 as follows:	
a. Turn main power switch to O position.	
b. While pressing in on the button on the backgauge control knob, check for continuity between plug connectors ST 32 pin 7, and ST 6 pin 4.	
	(a) If continuity is not present, replace backgauge control switch b14 (paragraph 5-20.14).
	(b) If continuity is present, replace ST motherboard (paragraph 5-20.12).
15. BACKGAUGE DOES NOT OPERATE MANUALLY.	
Step 1. Check for absence of continuity through switch b18 as follows:	
a. Remove front electronics enclosure cover.	
b. While pushing in the backgauge control knob, check for absence of continuity between plug connectors ST 73, pin 6 and ST 73 pin 4.	
	(a) If continuity is present, replace backgauge control switch b18 (paragraph 5-20.14).
	(b) If continuity is not present, adjust backgauge brake (paragraph 5-20.13, step j).

5-20. MAINTENANCE PROCEDURES.

This section contains instructions covering direct/general support maintenance functions for the paper cutter. 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

5-20.1 Check Clearance Between Knife and Clamp.

MOS: 83FJ6, Reproduction Equipment Repairer

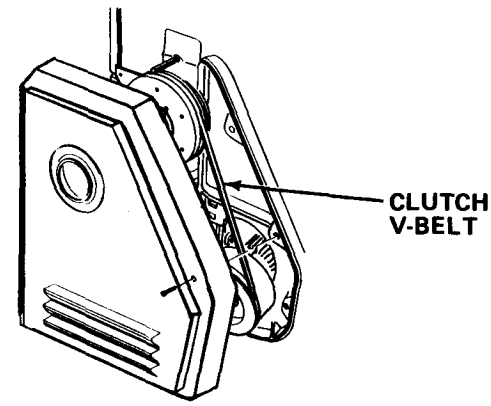
PERSONNEL: Two persons are required to perform this procedure.

TOOLS: Flat Tip Screwdriver
Knife Reset Handles
Knife Carrying Handles
Metric Feeler Gage (0.3 mm)

a. Turn main power switch to O position.

b. Remove main motor V-belt cover.

c. Remove clutch V-belt (paragraph 5-16.4).



WARNING

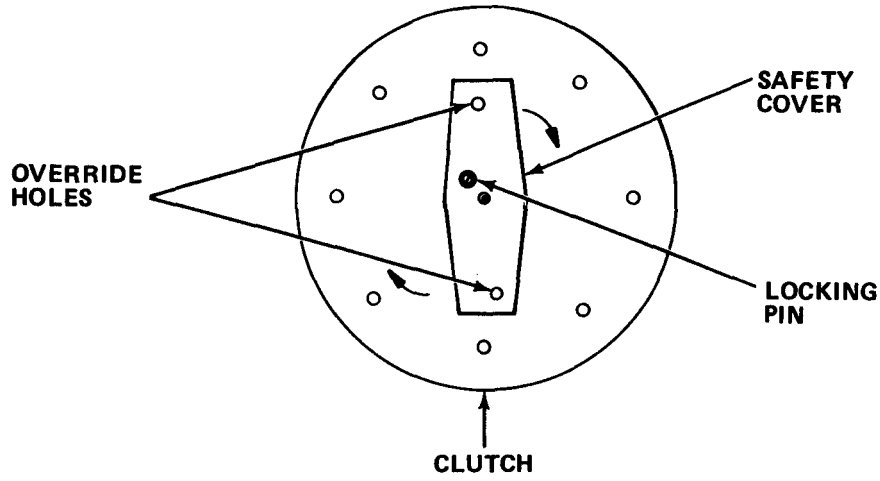
Keep hands and feet clear of main motor and hydraulic pump V-belt. Death or serious injury may occur from failure to do so.

d. Turn on power.

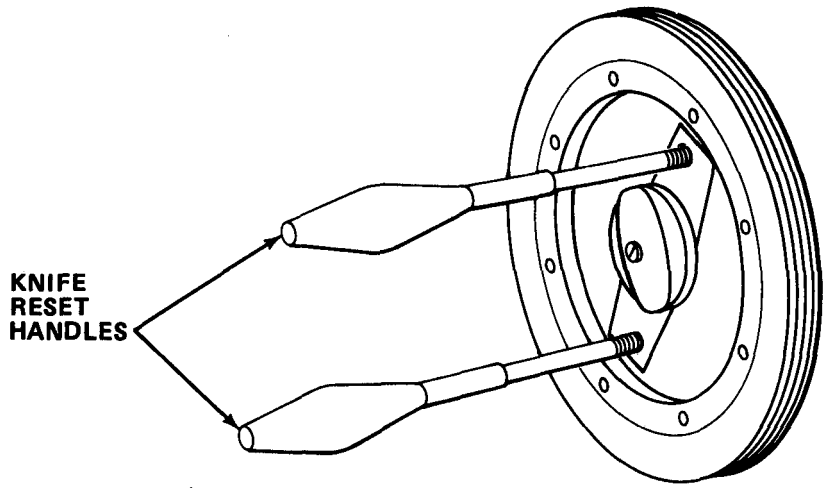
(1) Turn main power switch to I position.

(2) Press control power on switch.

e. Place a pile of paper under the clamp.



f. Using the tip of the knife carrying handle, press in the locking pin and rotate the safety cover to the right to gain access to the override holes on clutch.



g. Insert the knife reset handles into the holes.

h. Pressing in on the handles, rotate the pulley until the threads engage; then tighten the handles.

WARNING

Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.

i. Have an assistant press and hold the cutting buttons.

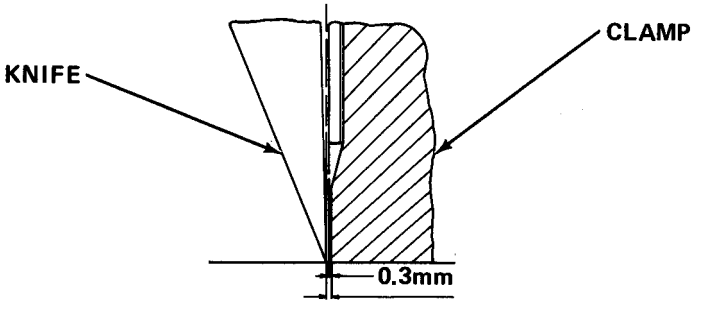
WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

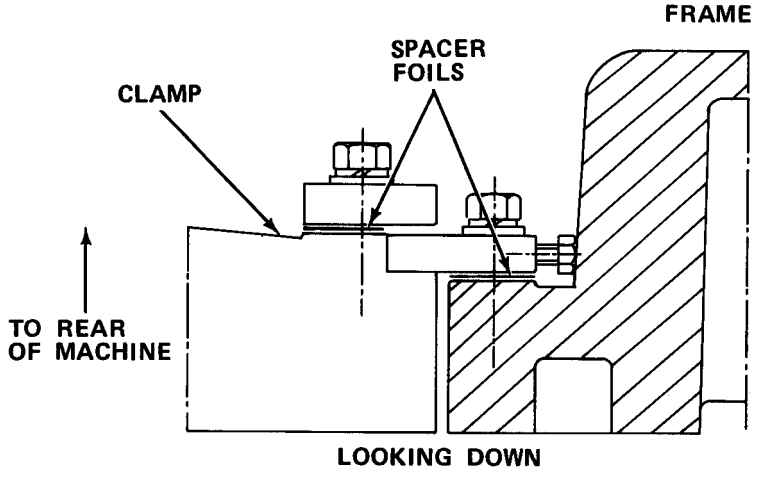
j. Manually lower the knife to the height of the clamp.

k. Check the clearance between the knife and the clamp.

l. Release the cutting buttons.



m. If the space is greater than 0.3 mm (.012 in.), remove foils behind side ledge of clamp as required (paragraph 5-20.22).



n. Manually position knife to its uppermost position.

o. Remove knife reset handles and rotate safety plate to cover override holes.

p. Turn main power switch to O position.

q. Reinstall main motor V-belt (paragraph 5-16.4).

r. Reinstall main motor V-belt cover.

5-20.2 Replace Control Block.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
3/8 in. Drive Ratchet
5 mm Hex Head Socket Bit
8 mm Hex Head Socket Bit
3 in. Extension
Fluid Evacuation Pump

SUPPLIES: Control Block
Control Block O-Rings
Grease (Item 11, Appendix E)
Hydraulic Fluid (Item 12, Appendix E)

WARNING

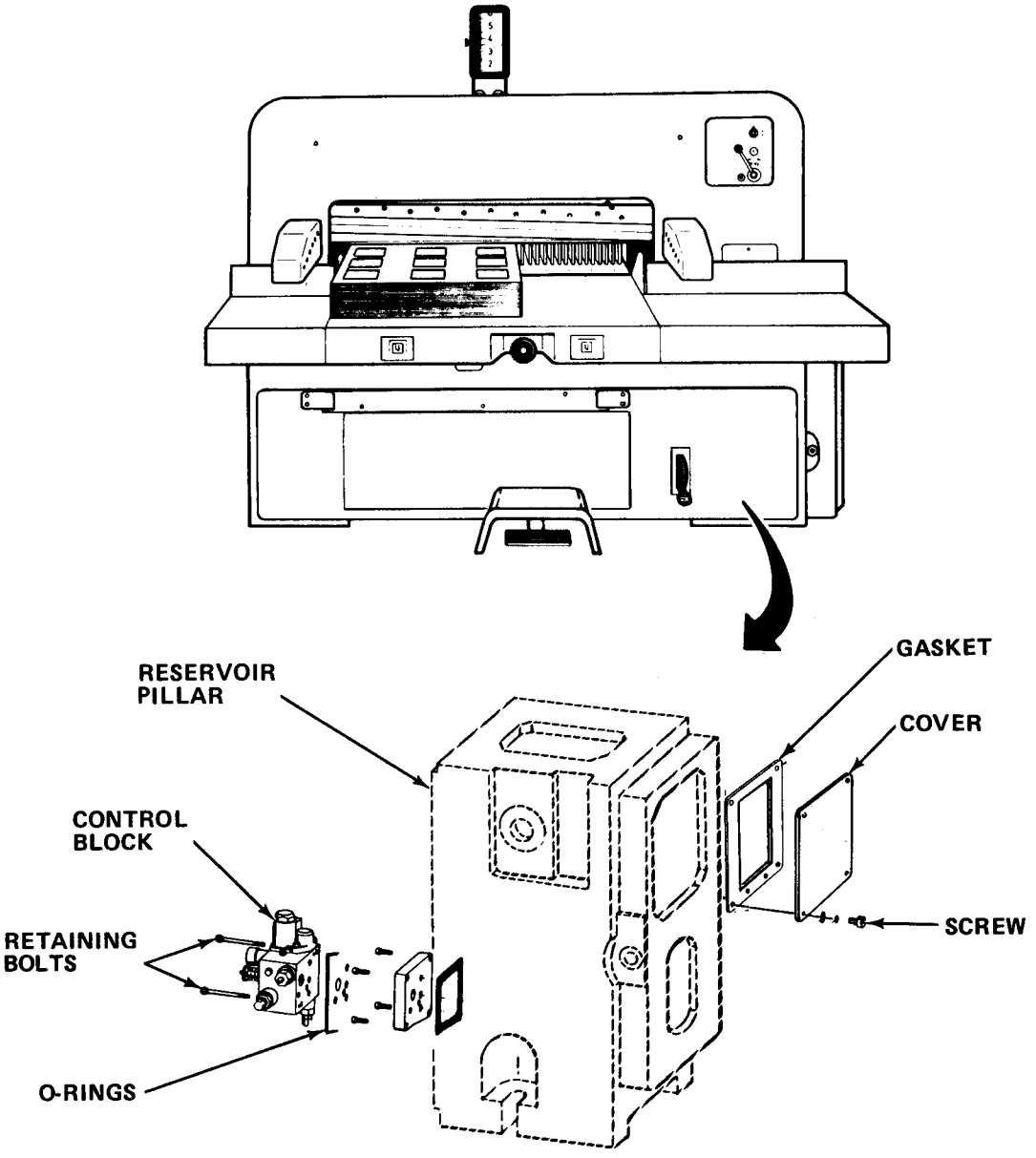
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn main power switch to O position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove main motor V-belt cover.



c. Remove side reservoir cover and gasket.

d. Using evacuation pump, remove all hydraulic fluid.

e. Remove front and rear electronics enclosure covers.

f. Remove right pillar cover.

g. Tag and disconnect electrical connections from solenoids.

h. Remove two hex head bolts retaining control block to connecting plate.

i. Remove control block and discard O-rings.

j. Install nine new O-rings to new control block, smearing O-rings with grease to prevent movement.

k. Reinstall control block to connecting plate and retain with bolts.

l. Reconnect electrical connections to solenoids.

m. Add clean hydraulic fluid to reservoir and bleed hydraulic system (paragraph 5-20.23).

5-20.3 Replace Control Valve.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
4 mm Hex Head Key Wrench
5 mm Hex Head Key Wrench
6 in. Adjustable Wrench

SUPPLIES: Slide Valve
Fitting Seals
Hydraulic Fitting
Hydraulic Fluid (Item 12, Appendix E)

WARNING

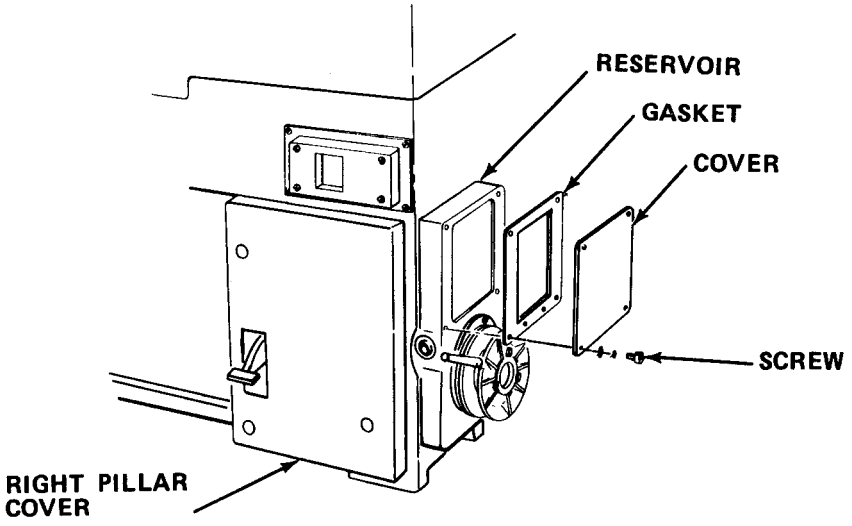
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn main power switch to O position.

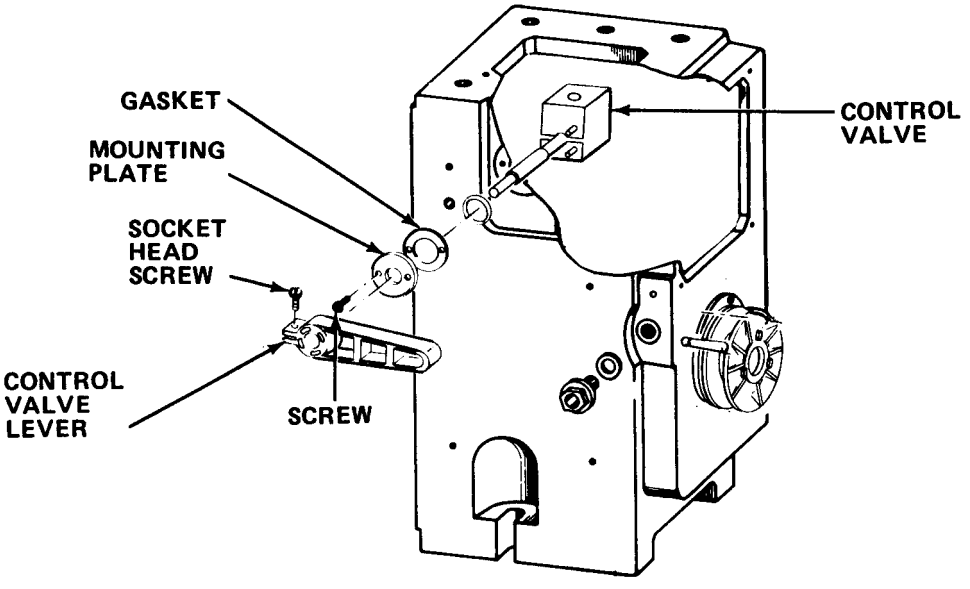
(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove main drive V-belt cover.



c. Remove side reservoir cover and gasket.

d. Remove right pillar cover.



e. Loosen socket head screw and remove control valve lever.

f. Loosen connections and remove four hydraulic lines from control valve.

g. Remove two socket head screws, mounting plate, and gasket.

h. Remove defective valve from reservoir.

i. Remove mounting hardware.

j. Reinstall fittings and new seals to new valve.

k. Install new valve into reservoir.

l. Reinstall mounting plate, gasket, and retaining screws.

m. Reinstall hydraulic lines and tighten fittings.

n. Reinstall lever to valve and tighten retaining screws.

o. Reinstall right pillar cover.

p. Bleed hydraulic system and add fluid if necessary (paragraph 5-20.23).

5-20.4 Replace Hydraulic Cylinder Suction Hose.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
4 mm Hex Head Key Wrench

SUPPLIES: Suction Hose
Hydraulic Fluid (Item 12, Appendix E)

WARNING

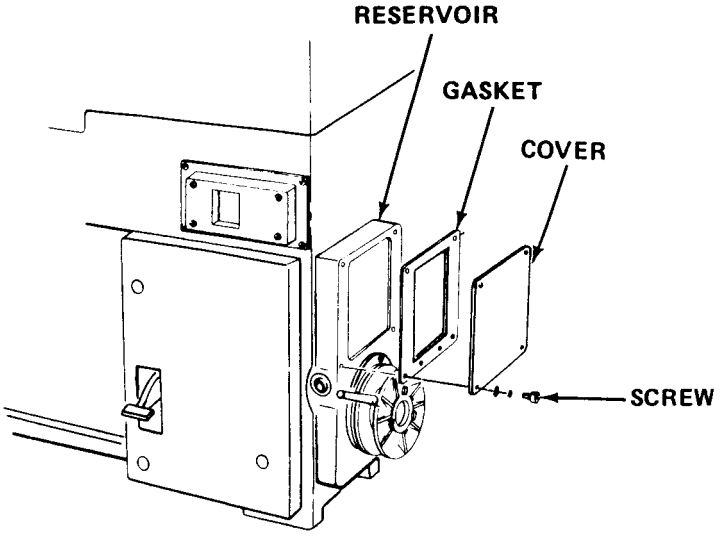
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn main power switch to O position.

(2) Using operator key, lock safety lock and keep key in your possession.

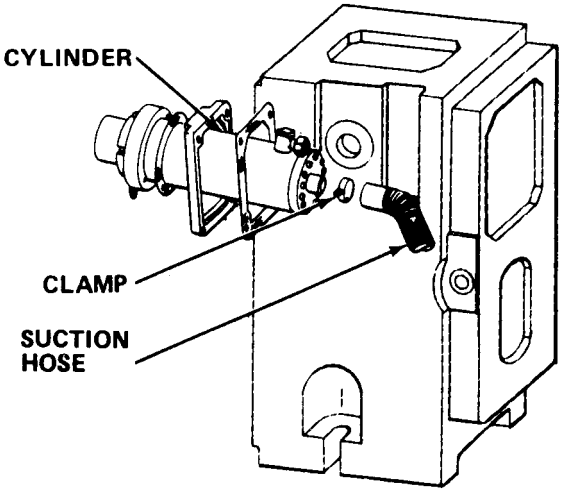
b. Remove main drive V-belt cover.



c. Remove side reservoir cover and gasket.

NOTE

Use care when removing clamp and avoid dropping it into hydraulic reservoir.



d. Loosen clamp screw and carefully remove suction hose and clamp from cylinder.

CAUTION

Be sure suction hose inlet extends below fluid level or hydraulic cylinder will move erratically.

e. Install new suction hose to cylinder and tighten clamp securely.

f. Bleed the hydraulic system (paragraph 5-20.23).

5-20.5 Replace Hydraulic Pump.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
13 mm Socket 1/4 in. Drive
1/4 in. Drive Ratchet
6 mm Socket 1/4 in. Drive
22 mm Combination Wrench
Fluid Evacuation Pump

SUPPLIES: Hydraulic Pump
Gaskets
Copper Washers
Pail
Cleaning Solvent (Item 26, Appendix E)
Hydraulic Fluid (Item 12, Appendix E)

WARNING

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

a. Turn off power.

(1) Turn main power switch to O position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove the main motor V-belt cover.

c. Remove side reservoir cover and gasket.

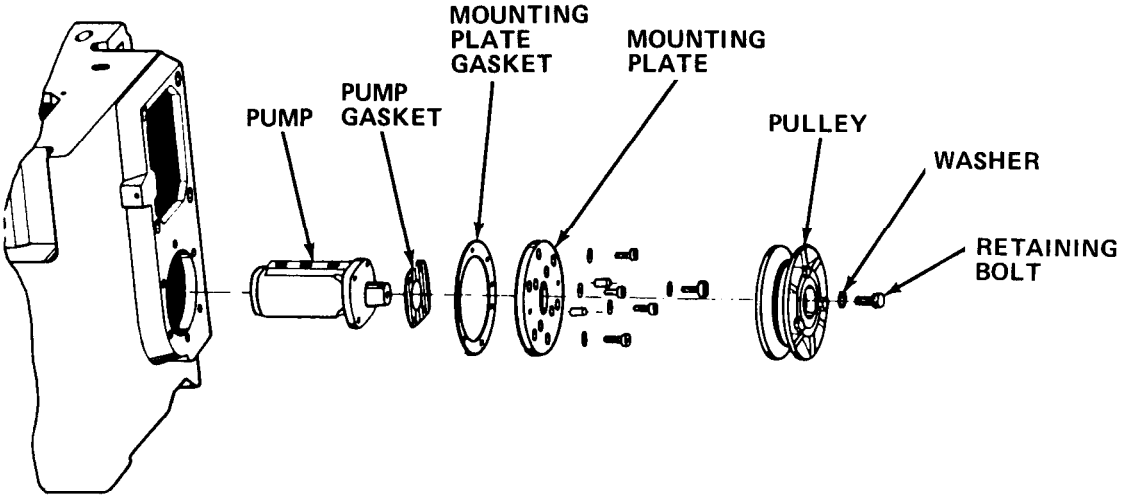
NOTE

If the hydraulic fluid is to be reused, be sure that the pail is clean before pumping fluid into it.

d. Using evacuation pump, pump all hydraulic fluid from the reservoir.

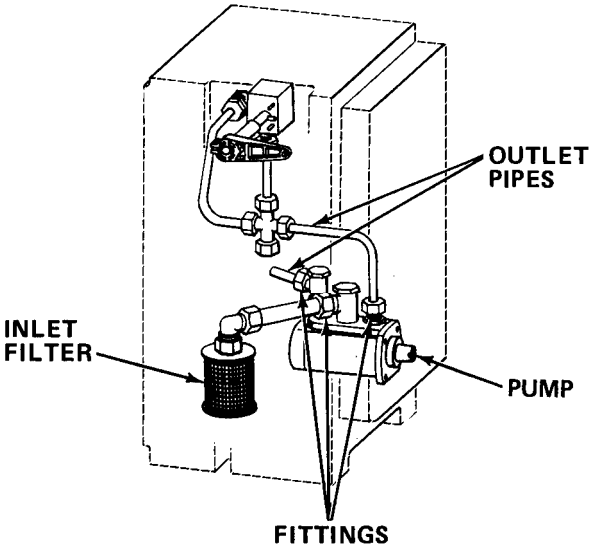
e. Remove the hydraulic pump V-belt (paragraph 5-16.4).

f. Remove the hydraulic pump pulley.



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).



g. Remove pump filter and pipes connected to pump. Clean filter with solvent and dry thoroughly.

h. Remove mounting bolts, plate and defective pump.

i. Using new gasket and copper washers, install new pump into reservoir.

j. Reinstall pump filter and reconnect pipes to pump.

k. Reinstall the hydraulic pump pulley.

l. Reinstall the main motor V-belt (paragraph 5-16.4).

m. Fill the reservoir with 17 liters (4.5 gallons) of hydraulic fluid.

n. Manually rotate the main motor to the right several times to lubricate the hydraulic fluid pump.

o. Bleed the hydraulic system (paragraph 5-20.23).

5-20.6 Service Hydraulic Fluid Filter.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
13 mm Socket 3/8 in. Drive
3/8 in. Drive Ratchet
6 mm Hex Head Key Wrench
22 mm Combination Wrench

SUPPLIES: Hydraulic Fluid Filter

WARNING

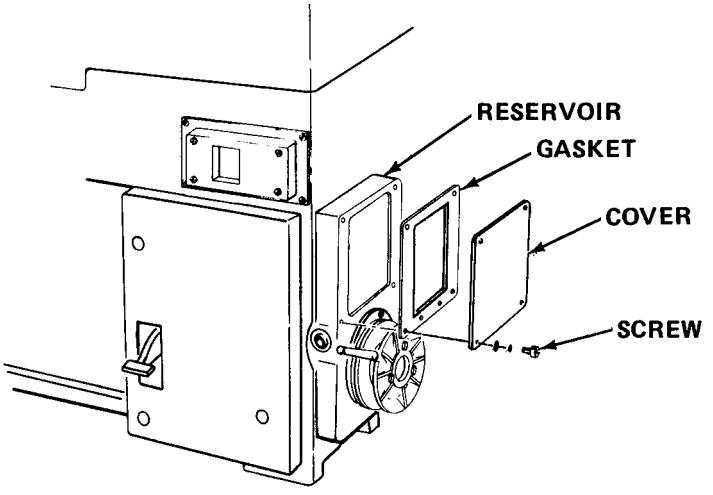
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

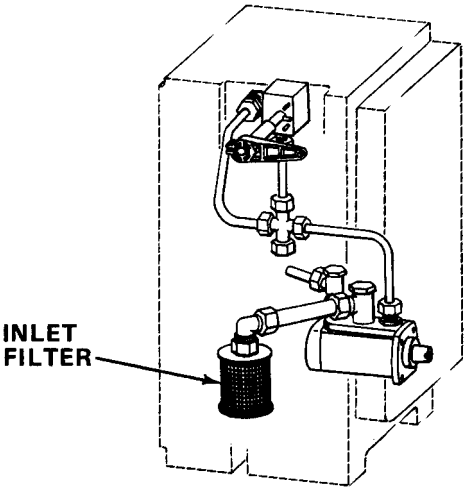
(1) Turn main power switch to O position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove main motor V-belt cover.



c. Remove side reservoir cover and gasket.



d. Remove contaminated fluid filter on side of hydraulic pump.

e. Clean and reinstall pump fluid filter.

f. Reinstall side reservoir cover and gasket.

g. Reinstall main motor V-belt cover.

h. Place operator key back into safety lock.

5-20.7 Replace Retarding Valve(s).

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
22 mm Combination Wrench

SUPPLIES: Retarding Valve

WARNING

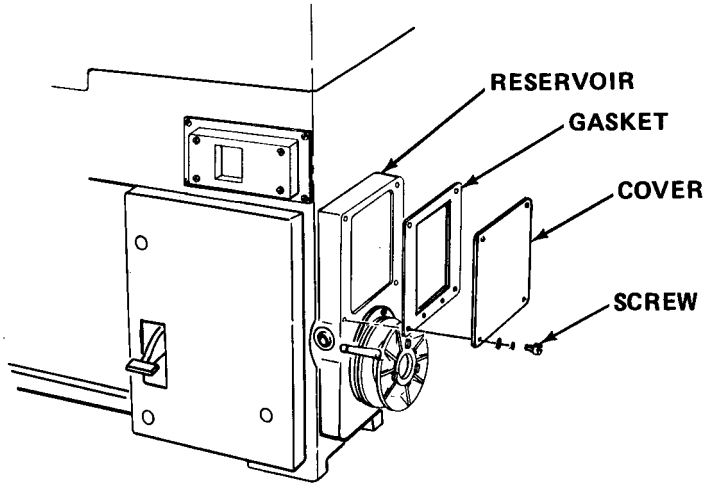
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

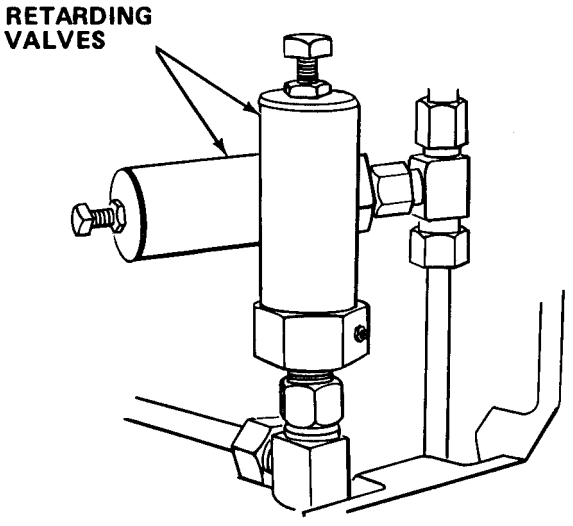
(1) Turn main power switch to O position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove main drive V-belt cover.



c. Remove side reservoir cover and gasket.



d. Loosen fitting and remove defective retarding valve.

e. Install new retarding valve and tighten fitting securely.

f. Bleed the hydraulic system (paragraph 5-20.23).

5-20.8 Replace Clamp Cylinder.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Three persons are required to perform this procedure.

TOOLS: Flat Tip Screwdriver
6 in. Adjustable Wrench
24 mm Combination Wrench
22 mm Combination Wrench
10 mm Combination Wrench
6 mm Hex Head Socket Bit
10 mm Hex Head Socket Bit
3/8 in. Drive Ratchet
4 mm Hex Head Key Wrench
Knife Carrying Handles
Ball Peen Hammer
Pry Bar
Fluid Evacuation Pump

SUPPLIES: Hydraulic Clamp Cylinder
Clamp Cylinder Gasket (2)
Pail
Rags (Item 21, Appendix E)

WARNING

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

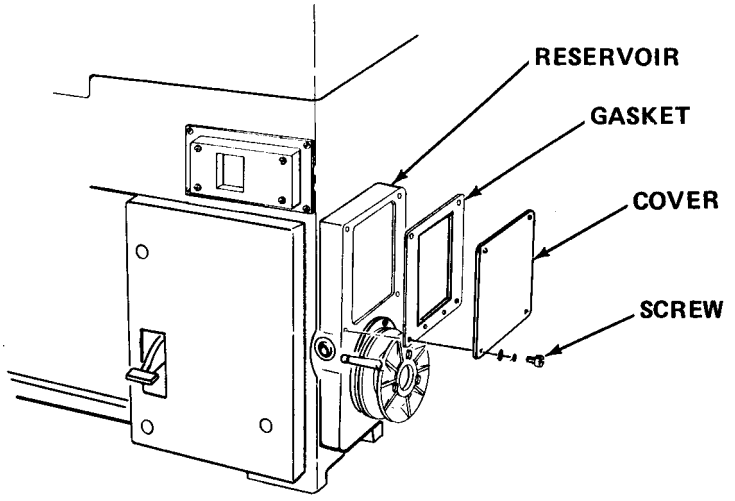
a. Turn off power.

(1) Turn main power switch to O position.

(2) Using operator key, lock safety lock and keep key in your possession.

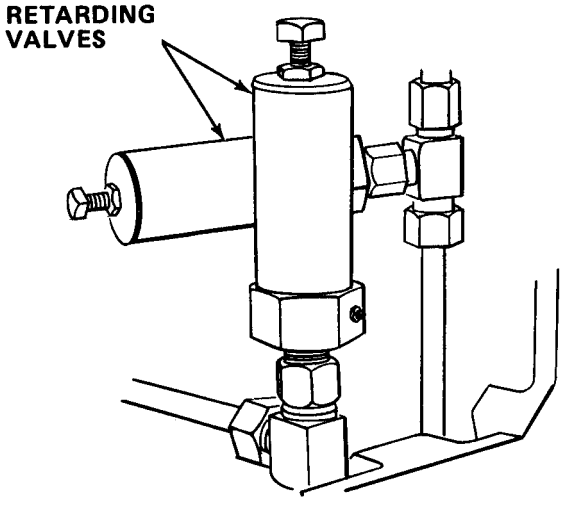
b. Remove main motor V-belt cover.

c. Remove the pump V-belt (paragraph 5-16.4).



d. Remove side reservoir cover and gasket.

e. Using fluid evacuation pump, remove approximately 3 gallons of hydraulic fluid.



f. Remove both retarding valves (paragraph 5-20.7).

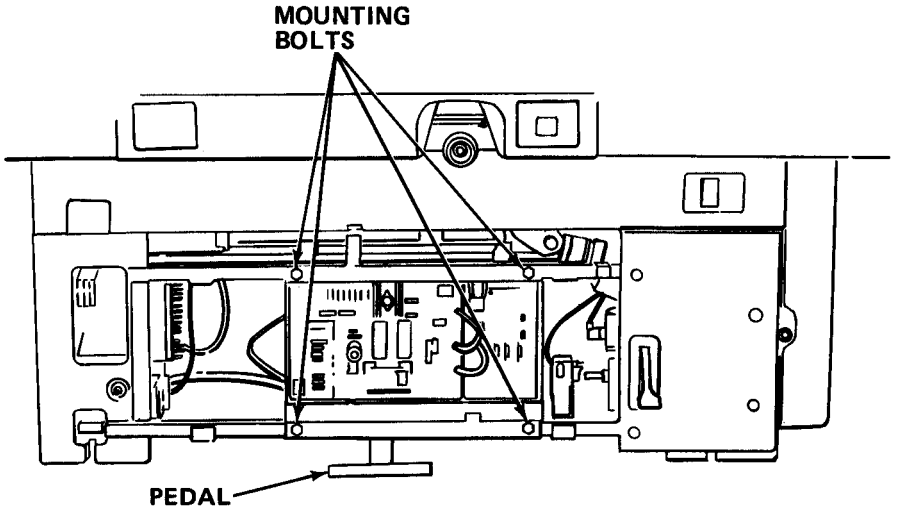
g. Remove right pillar cover.

h. Remove front and rear electronics enclosure covers.

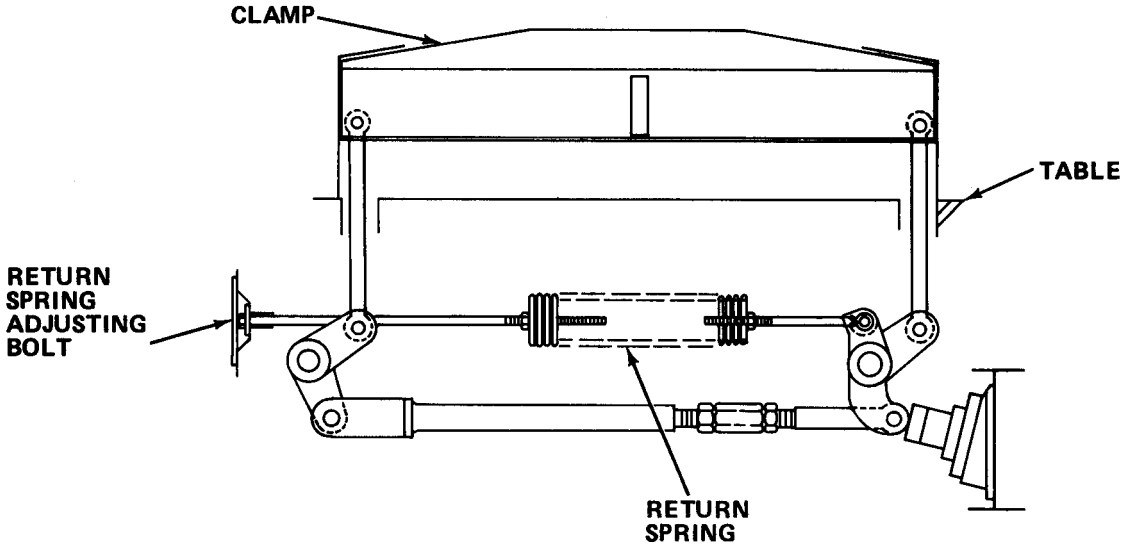
i. Loosen hydraulic line connection going to clamp cylinder from the control valve.

j. Remove clamp suction hose (paragraph 5-20.4).

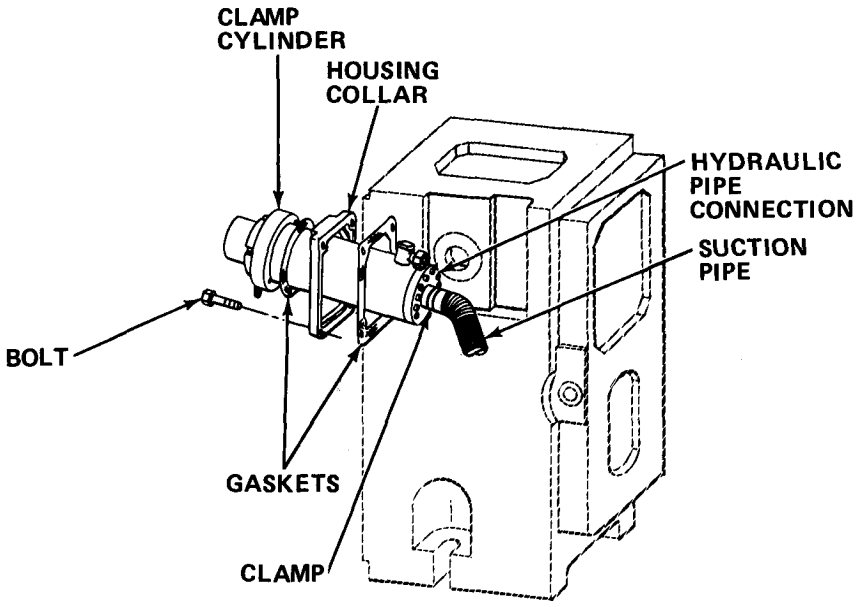
k. Remove lid from wire box so that the wiring may be moved around.



m. Remove four mounting bolts for electronic enclosure frame and move enclosure aside to allow free access to clamp cylinder.



n. Loosen the clamp return spring, noting the number of turns it takes to lower the clamp to the table.



o. Remove four mounting bolts securing clamp cylinder housing and remove defective clamp cylinder and housing.

p. Remove pipe from clamp cylinder.

NOTE

Note position of clamp cylinder as mounted in the housing before removal.

q. Remove four socket head screws and defective clamp cylinder from housing.

r. Mount new clamp cylinder to cylinder housing, using new gasket.

s. Reconnect pipe to clamp cylinder.

NOTE

- This step will require the use of three persons. Have one person under the backgauge table, one at the front of the cutter, and one at the side to help pull and guide the cylinder in place.
- It may be necessary to loosen the pipe on top of the clamp cylinder to ease installing the cylinder.
- It may be necessary to use the knife carrying handles to aid in alining the mounting bolt holes.

t. Reconnect clamp cylinder and housing to right pillar using new gasket.

u. Reconnect clamp cylinder pipe to control valve. Be sure that both ends of the pipe are connected -tightly.

v. Reconnect clamp cylinder suction hose (paragraph 5-20.4).

w. Reinstall both retarding valves (paragraph 5-20.7).

x. Place hydraulic fluid back into reservoir.

y. Reinstall hydraulic pump V-belt (paragraph 5-16.4).

z. Reinstall electronics enclosure frame and secure with four mounting bolts.

aa. Reinstall any loose wires back into wire box and reinstall wire box lid.

ab. Tighten the return spring the same number of turns it took to loosen it, as noted in step n.

ac. Bleed the hydraulic system (paragraph 5-20.23).

5-20.9 Replace Control Transformer.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: 10 mm Nut Driver
Flat Tip Screwdriver

SUPPLIES: Control Transformer

WARNING

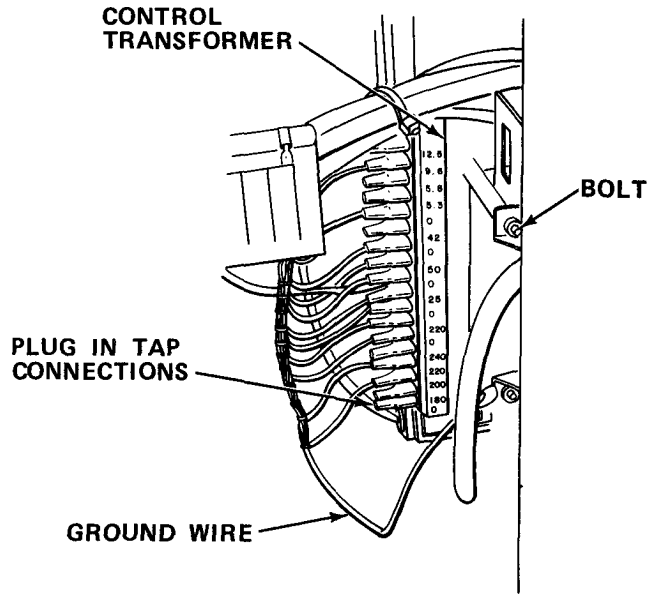
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn main power switch to O position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove front electronics enclosure cover by turning mounting screws one-half turn left.



c. Tag and disconnect wires from control transformer taps and remove dummy connectors.

d. Remove control transformer mounting bolts, ground wire, and defective transformer.

e. Install new control transformer, ground wire, and secure with mounting bolts.

CAUTION

Leave no taps open to air or damage to paper cutter may occur. Cover unused taps with dummy connectors.

f. Reconnect transformer wires and reinstall dummy connectors.

g. Reinstall front electronics enclosure cover.

h. Turn on circuit breaker.

5-20.10 Replace Main Distributor HP Card.

MOS: 35E, Special Electronic Devices Repairer

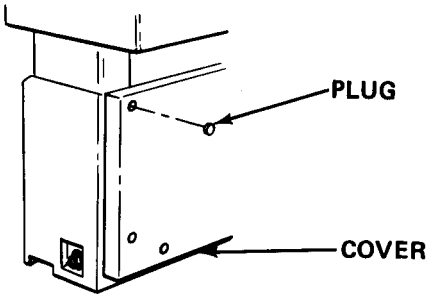
TOOLS: Flat Tip Screwdriver
13 mm Combination Wrench

WARNING

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

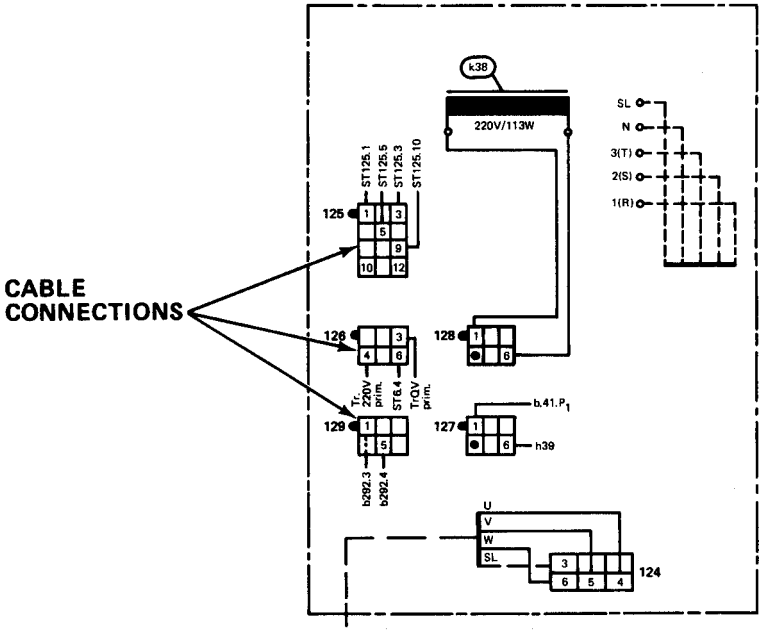
a. Turn main power switch to O position.

b. Turn off circuit breaker.

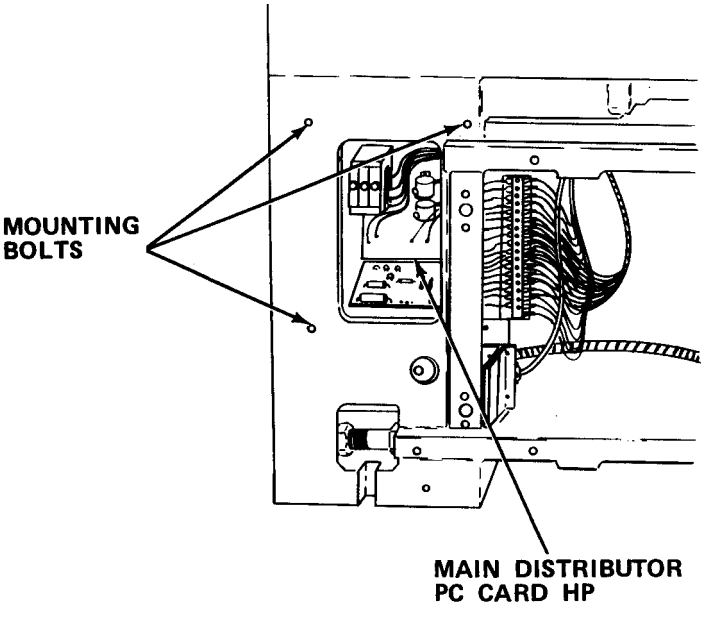


c. Remove HP card front cover panel.

d. Remove front electronics enclosure cover.



e. Tag and disconnect cable connections from rear of HP card.



g. Remove nuts holding HP mounting panel, slide panel off and pull out.

h. Remove screws attaching HP card to mounting panel and remove defective card.

i. Insert new card on panel and attach with mounting screws.

j. Remount HP panel on mounting bolts and secure with nuts.

k. Reconnect power cables and cable connections. Be sure that number on connector matches number on card. Set HP circuit breakers by pressing reset buttons.

l. Reinstall HP card cover panel.

m. Reinstall front electronics enclosure cover.

n. Turn on circuit breaker.

5-20.11 Replace A Plus-In PC Card.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Plug-in PC Card

WARNING

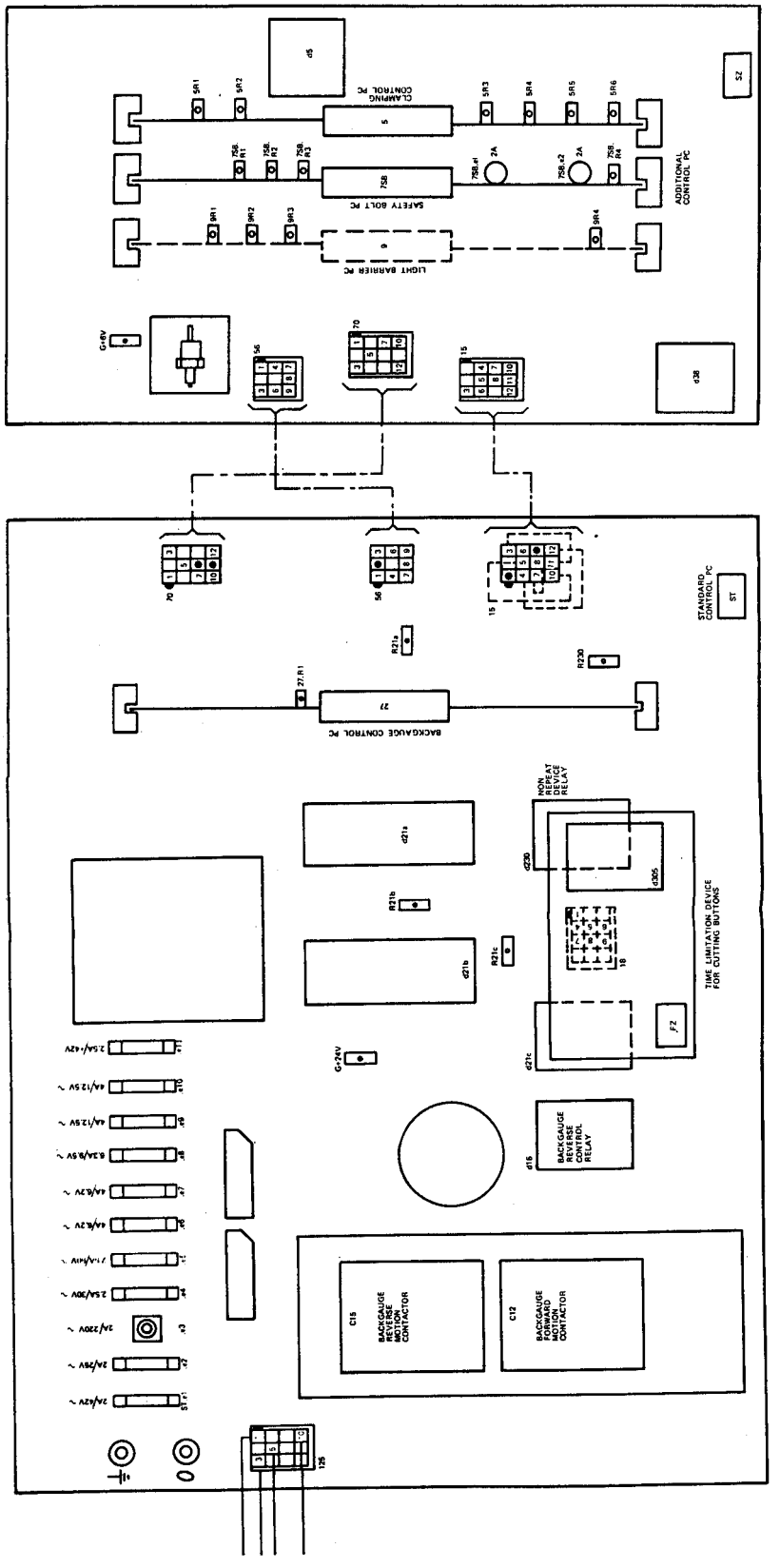
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

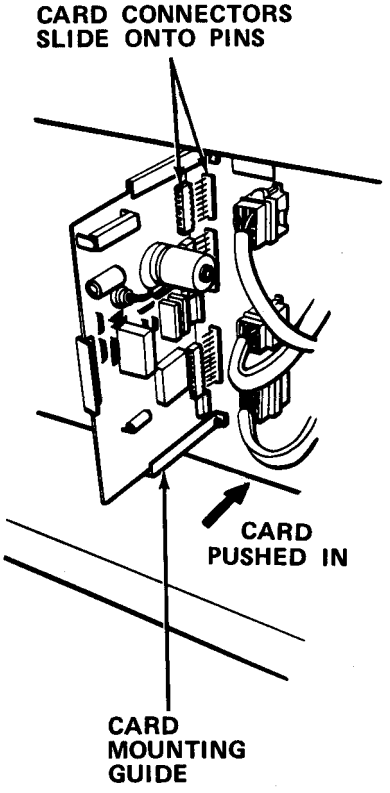
(1) Turn main power switch to O position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove front electronics enclosure cover.


CLAMPING CONTROL PC
SAFETY BOLT PC
LIGHT BARRIER PC
ADDITIONAL CONTROL PC
STANDARD CONTROL PC
BACKGAUGE CONTROL PC
NON REPEAT DEVICE RELAY
TIME LIMITATION DEVICE FOR CUTTING BUTTONS
BACKGAUGE REVERSE MOTOR CONTACTOR
BACKGAUGE FORWARD MOTOR CONTACTOR
BACKGAUGE REVERSE CONTROL RELAY

c. Locate PC card to be removed.



d. Remove card by gently pulling forward on mounting guides.

e. Insert new card by sliding card along mounting guides until PC card connectors contact pins of motherboard.

CAUTION

Be sure PC card is alined vertically with motherboard and not crimped at an angle, or damage to pins may occur.

f. Gently push connectors onto pins until spacers touch surface of motherboard.

g. Reinstall front electronics enclosure cover.

h. Place operator key back into safety lock.

5-20.12 Replace A Motherboard PC Card.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
7 mm Nut Driver

SUPPLIES: Motherboard PC Card ST or SZ

WARNING

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

a. Turn off power.

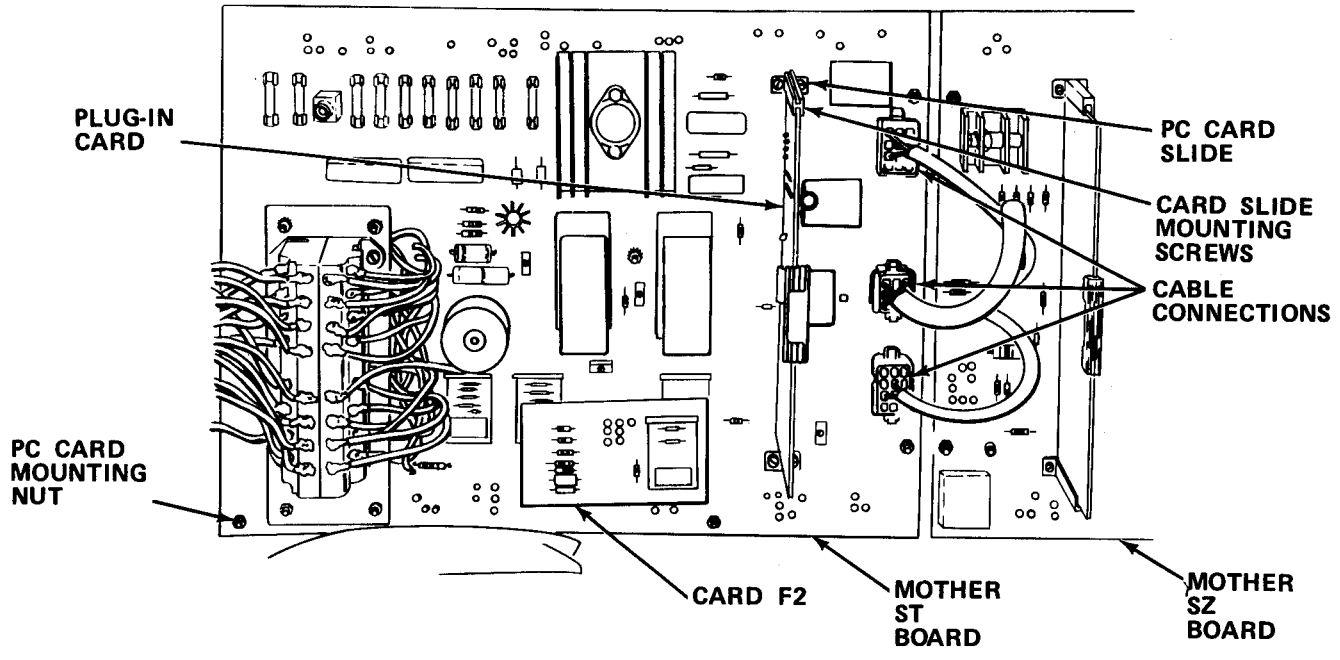
(1) Turn main power switch to O position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove front electronics enclosure cover.

c. Remove rear electronics enclosure cover.

d. Tag and disconnect connectors from rear of motherboard.



e. Tag and disconnect cable connections 70, 56, and 15 between cards SZ and ST.

f. Pull out plug-in PC cards.

g. Remove plug-in PC card mounting guides by removing two mounting screws holding each guide.

h. Remove PC card mounting nuts and spacers. Pull defective motherboard off bolts.

i. Place new motherboard onto mounting bolts. Check that spacers are in place behind PC card.

j. Reinstall mounting nuts.

k. Reinstall plug-in PC card mounting guides with mounting screws. Check that groove is in correct orientation.

l. Reconnect cable connections 15, 56, and 70 between cards ST and SZ.

m. Reconnect cable connectors on rear of motherboard. Check that numbers on each connector are same as jack number.

n. Slide plug-in PC card or cards back in place. Check that cards are oriented correctly. Push card connectors onto pins until they are flush with base.

o. Check that all fuses are in place.

p. Reinstall front and rear electronics enclosure covers.

q. Place operator key back into safety lock.

5-20.13 Replace Backgauge Brake Pads.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 13 mm Combination Wrench
19 mm Combination Wrench
Metric Feeler Gage (0.1 - 0.2 mm)

SUPPLIES: Brake Pad

WARNING

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

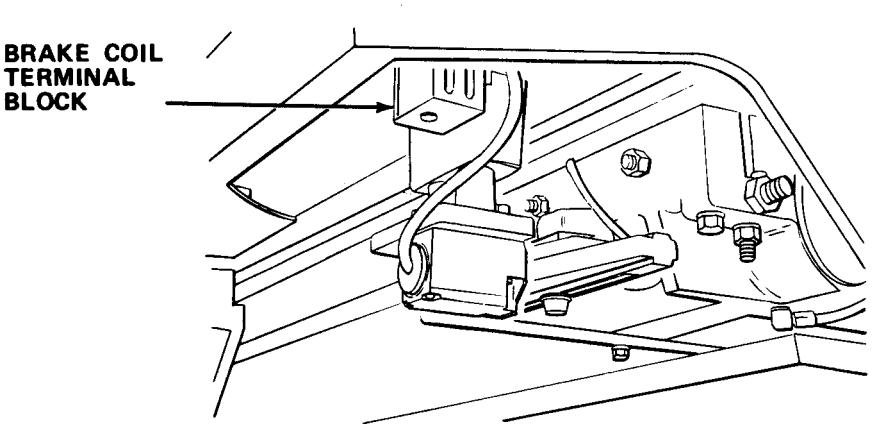
a. Turn off power.

(1) Turn main power switch to O position.

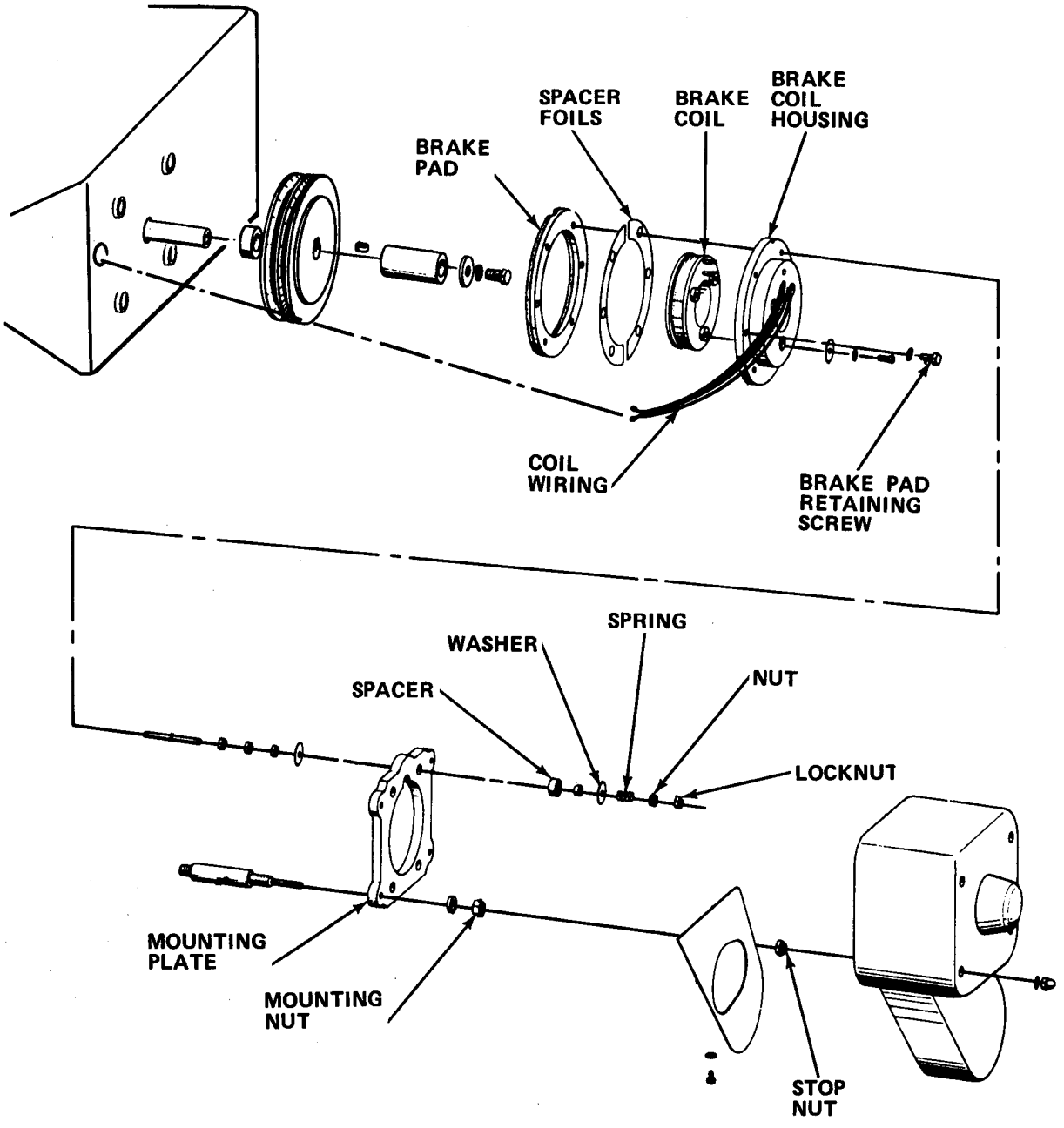
(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove brake V-belt cover.

c. Remove four stop nuts; remove four nuts which secure brake to mounting stud and remove brake.



d. Tag and disconnect brake coil wires from terminal block under table.



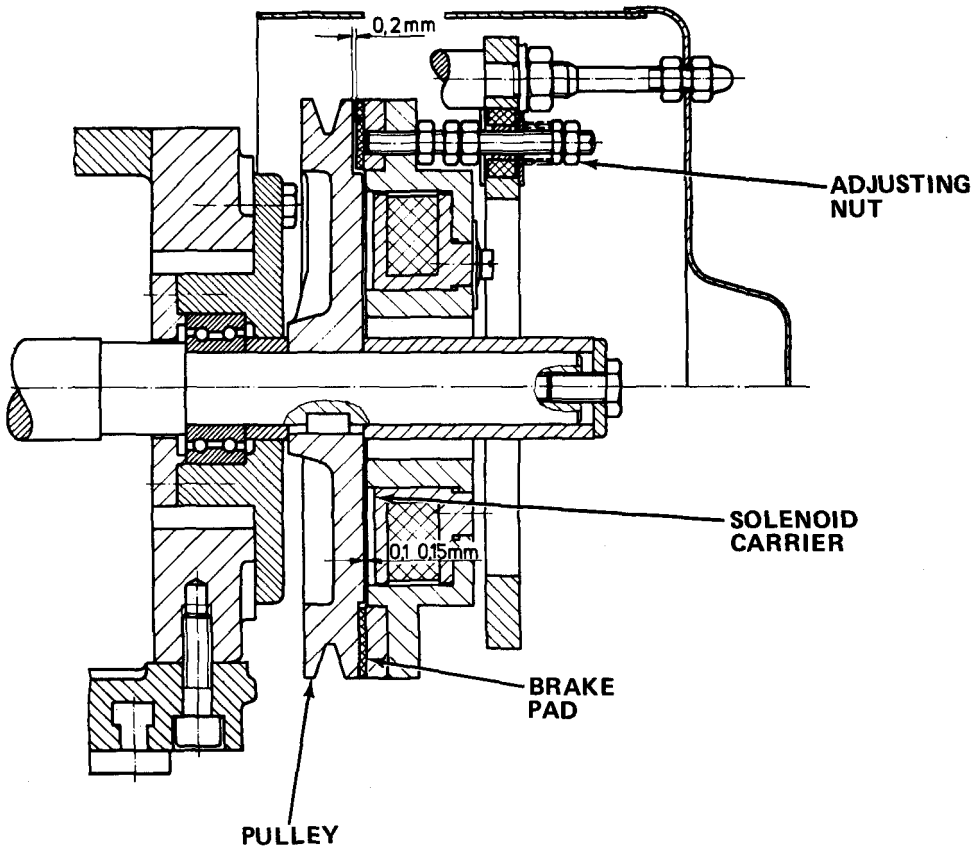
e. Remove four nuts, locknuts, springs, and washers which secure brake coil housing to mounting plate and remove mounting plate.

f. Remove six retaining screws and remove brake pads and spacers,

g. Install spacer foils and new brake pad. Secure with retaining screws.

h. Reinstall mounting plate on brake housing and secure with four nuts, locknuts, springs, and washers.

i. Reinstall brake on mounting studs and secure with four nuts and washers.



j. Check gap measurements. Gap between pulley and brake pad must be 0.20 mm (0.008 in.). Gap between pulley and solenoid carrier must be 0.1 mm (0.004 in.) up to maximum of 0.15 mm (0.006 in.) with brake engaged. These gaps should be same at all points along circumference of brake. Gaps may be adjusted by using spacer foils between brake pad and brake housing and by turning four adjusting nuts.

k. Reconnect brake coil wires to terminal block under table.

l. Reinstall brake V-belt cover.

m. Place operator key back into safety lock.

5-20.14 Replace Backgauge Control Switches.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Switch

WARNING

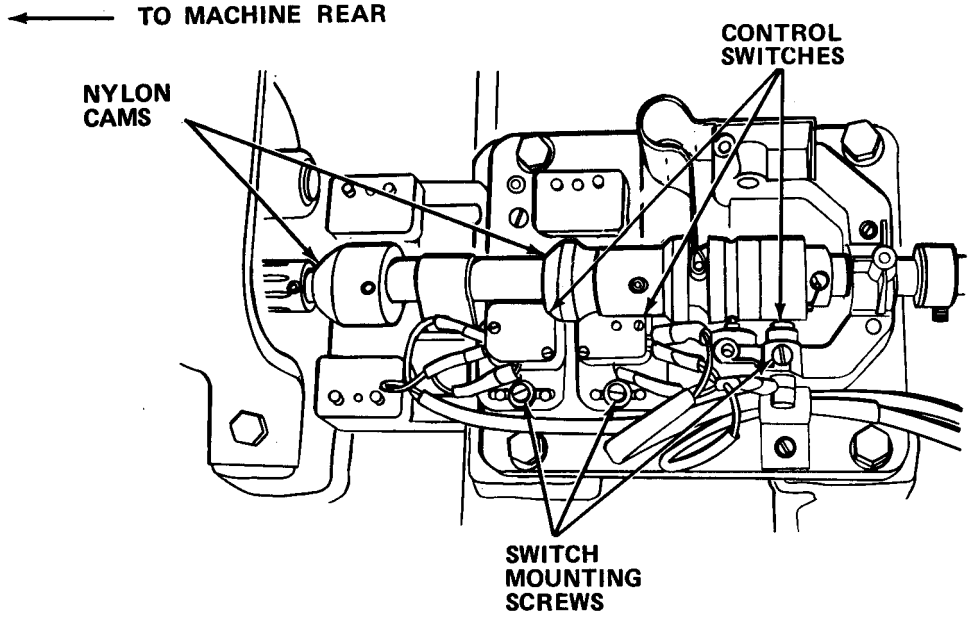
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn main power switch to O position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove backgauge control switch cover.



c. Tag and disconnect wires from defective switch.

d. Remove screws holding switch in place and remove defective switch and spacer board.

e. Install new switch and spacer board but do not tighten screws.

f. Adjust switch by moving appropriate knob control in or out the maximum distance. Then move switch until knob control activates switch. Tighten switch mounting screws.

g. Reconnect wires.

h. Reinstall backgauge control switch cover.

i. Place operator key back into safety lock.

5-20.15 Replace False Clamp Switch.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Cross Tip Screwdriver

SUPPLIES: Switch

WARNING

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

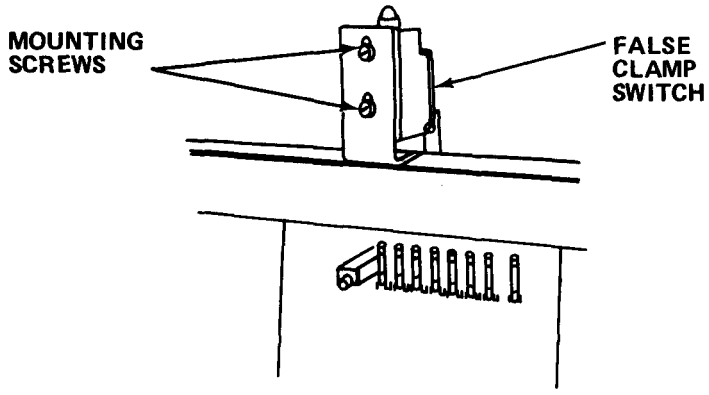
a. Turn off power.

(1) Turn main power switch to O position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove front electronics enclosure cover.

c. Loosen captive screw on switch cover and lower cover.



d. Tag and disconnect wiring from defective switch.

e. Remove mounting screws and defective switch.

f. Install new switch and secure with screws.

g. Reconnect wiring and close switch cover, securing with screw.

h. Adjust switch in a manner so that when the false clamp is stored, the switch is activated.

i. Reinstall front electronics enclosure cover.

j. Place operator key back into safety lock.

5-20.16 Replace Connecting Rod Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
Ball Peen Hammer
Pin Punch
36 mm Combination Wrenches (2)
19 mm Socket with 3/8 in. Drive
3/8 in. Drive Ratchet
19 mm Combination Wrench
Pry Bar

SUPPLIES: Connecting Rod Assembly

WARNING

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

a. Turn off power.

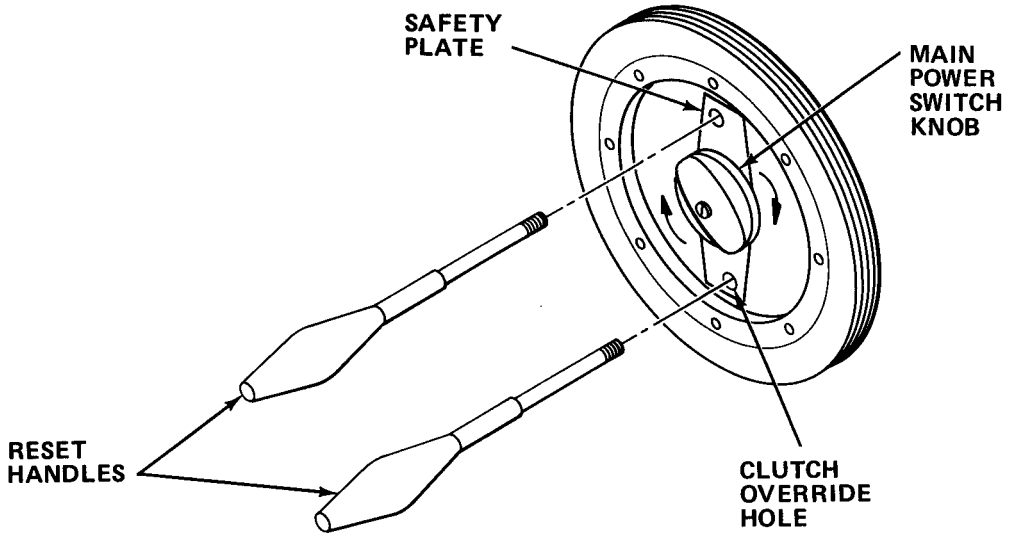
(1) Turn main power switch to O position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove the main motor V-belt cover.

c. Remove main power switch knob.

d. Install main power switch knob onto shaft on safety plate.



e. Rotate knob to the right to uncover the clutch override holes.

f. Insert the reset handles into the override holes and rotate to the right until the threads engage. Tighten handles.

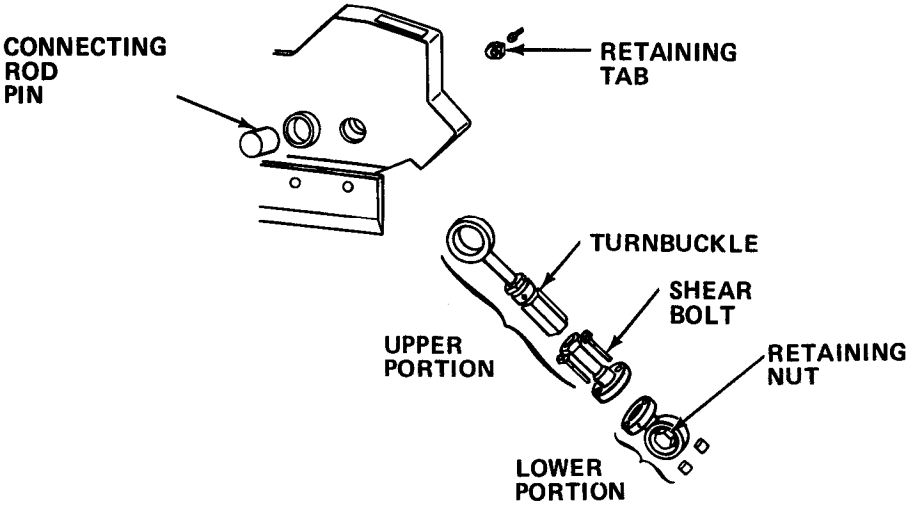
NOTE

It may be necessary to remove the safety bolt cover and hold the safety bolt back to move the knife through its movement.

g. Rotate handles and main drive gear to the right until the carrier is in such a position that the connecting rod pin is just clear of the frame (looking from the rear of the machine).

h. Remove eccentric cover.

i. Remove shear bolts.



j. Turn the turnbuckle so the connecting rod becomes shorter.

k. Remove the retaining tab on the connecting rod pin and knock out the retaining pin.

l. Remove the upper portion of the defective connecting rod.

m. Remove the retaining nut and pry off the lower portion of the defective connecting rod from the eccentric.

n. Install the lower portion of the new connecting rod onto the eccentric and secure with nut.

o. Install the upper portion of the new connecting rod into the carrier and insert the pin.

p. Reinstall the retaining tab.

q. Turn the turnbuckle so that the two connecting rod halves are alined.

r. Reinstall the shear bolts.

s. Manually position the knife to its uppermost position.

t. Reinstall the eccentric cover.

u. Remove reset handles.

v. Rotate clutch plate to the left to cover the override holes.

w. Remove main power switch knob and reinstall it onto the control panel.

x. Reinstall the main motor V-belt cover.

y. Perform knife replacement procedure to readjust all carrier adjustments (paragraph 5-16.13).

5-20.17 Replace Main Drive Gear and Clutch Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Four persons are required to perform this procedure.

TOOLS: Flat Tip Screwdriver
24 mm Combination Wrench
22 mm Combination Wrench
19 mm Combination Wrench
5 mm Hex Head Socket Bit with 3/8 in. Drive
17 mm Socket with 3/8 in. Drive
3/8 in. Drive Ratchet
19 mm Socket with 3/8 in. Drive
Pry Bar
Ball Peen Hammer
1/4 in. Punch, 8 in. long

SUPPLIES: Main Drive Gear and Clutch Assembly
Pail
Liquid Gasket (Item 14, Appendix E)
Gear Oil (Item 10, Appendix E)

WARNING

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

a. Turn off power.

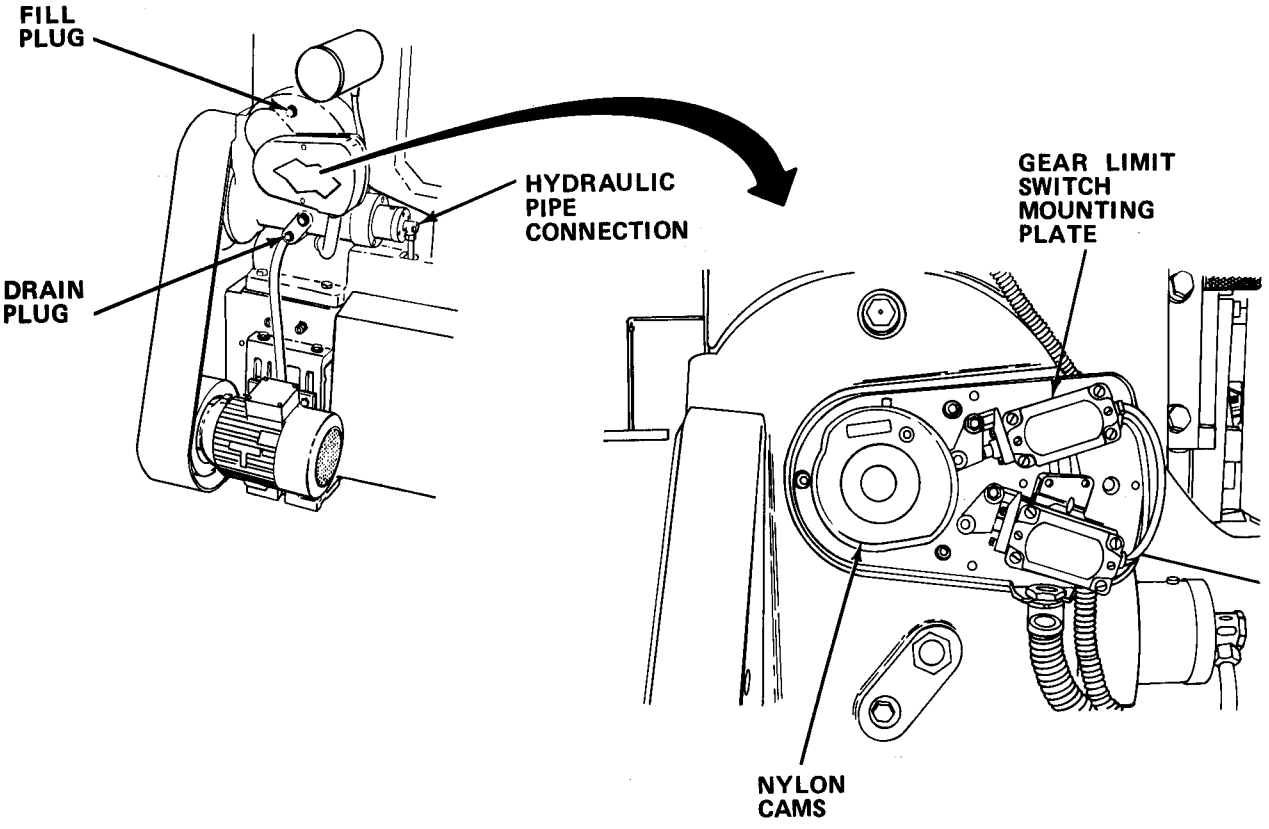
(1) Turn main power switch to O position.

(2) Using operator key, lock safety lock and keep key in your possession.

b. Remove the cover over the gear limit switches.

c. Remove the nylon cams and washers/spacers.

d. Remove gear limit switch mounting plate.



e. Remove drain plug and drain gear oil into pail.

f. Place a pail under hydraulic pipe fitting and remove pipe.

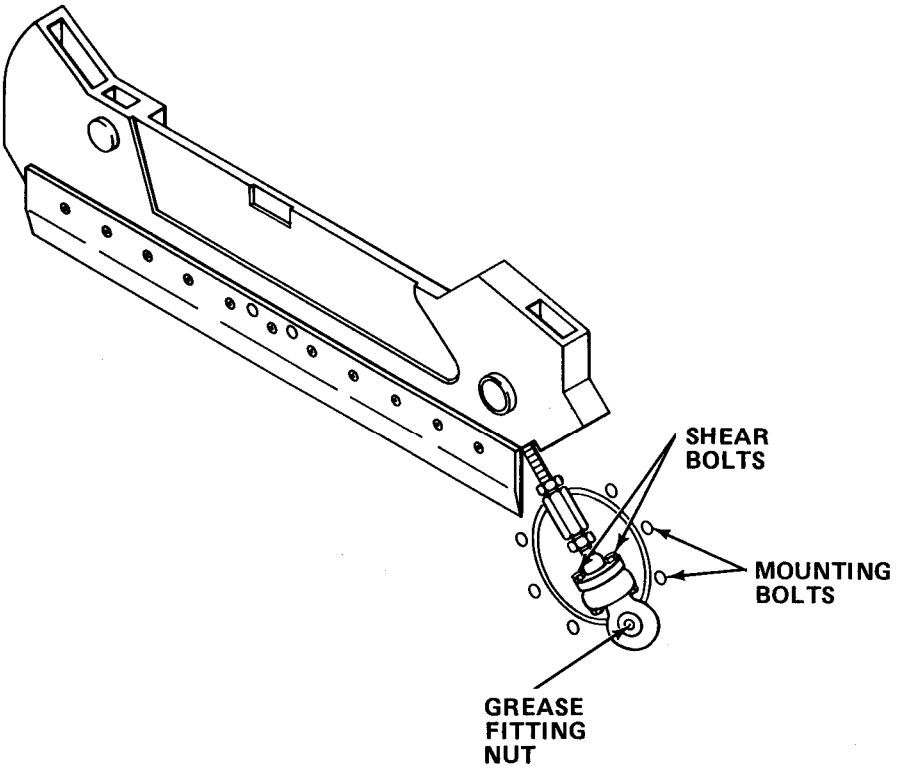
g. Remove both sides of the main motor V-belt cover.

h. Remove clutch V-belt (paragraph 5-16.4).

i. Remove eccentric cover plate.

j. Remove top plastic cover on right side.

k. Remove connecting rod shear bolts.



WARNING

Serious injury may occur if knife carrier assembly is not blocked with 2 x 4's.

l. Remove grease fitting nut and connecting rod from eccentric.

WARNING

Serious injury may occur if inadequate number of personnel are used to move main drive gear and clutch assembly. This equipment weighs approximately 280 lbs (127 kg).

m. Have three persons holding the main drive gear and clutch assembly from behind the cutter. A fourth person must remove the mounting bolts and carefully remove defective main drive gear and clutch assembly.

n. Drive out pin and pry eccentric from drive shaft.

o. Reinstall eccentric by alining tab and carefully tap eccentric onto shaft with hammer.

p. Have three persons install the new main drive gear and clutch assembly from behind the cutter while a fourth person installs mounting bolts.

q. Manually rotate clutch and install connecting rod shear bolts.

r. Reinstall top cover.

s. Reinstall eccentric cover plate.

t. Reinstall clutch V-belt (paragraph 5-16.4).

u. Reinstall both sides of the main motor V-belt cover.

v. Reconnect the hydraulic pipe.

w. Reinstall gear limit switches and mounting plate.

x. Reinstall the nylon cams and washers/spacers.

y. Reinstall the cover over the gear limit switches.

z. Add gear oil to gear box as necessary to fill.

aa. Perform knife replacement procedures to readjust all carrier adjustments (paragraph 5-16.13).

ab. Bleed the hydraulic system (paragraph 5-20.23).

5-20.18 Replace Paper Cutter.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Six persons are required to perform this procedure.

TOOLS: Flat Tip Screwdriver
15/16 in. Socket with 1/2 in. Drive
1/2 in. Drive Ratchet
13 mm Combination Wrench
23 mm Combination Wrench
15 mm Combination Wrench
14 mm Hex Head Key Wrench
17 mm Hex Head Key Wrench
5 mm Hex Head Key Wrench
7/16 in. Combination Wrench
Crow Bar
Long Tine Fork Lift
Hydraulic Pallet

SUPPLIES: Paper Cutter

a. Remove paper shredder (paragraph 4-20. 10).

b. Remove bindery table (paragraph 8-16.1).

c. Remove paper drilling machine (paragraph 2-16.7).

d. Remove book and pamphlet stitcher (paragraph 3-16.10).

e. Remove photolithographic cabinet (paragraph 8-16.4).

f. Remove roadside wall storage cabinet (paragraph 8-16.2).

g. Remove photolithographic cabinet (paragraph 8-16.3).

h. Remove shock mounts for paper shredder.

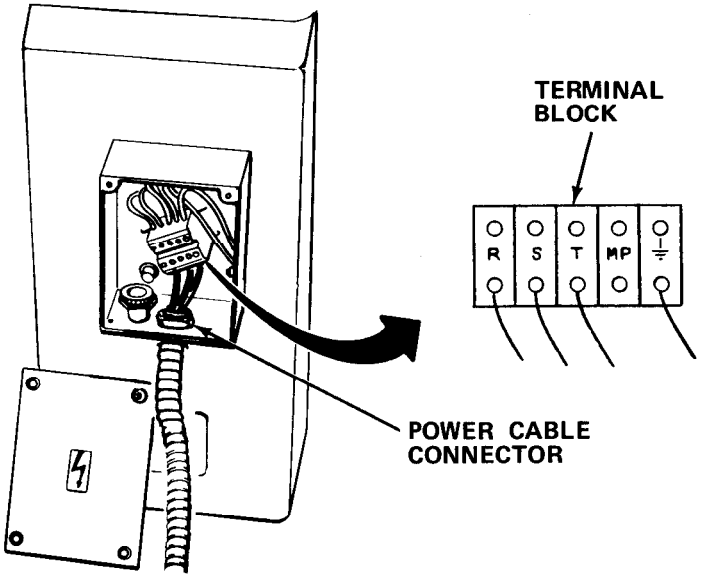
i. Remove all strapped down and loose objects.

j. Remove all tiedown straps.

WARNING

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

k. Turn off circuit breaker.



l. Remove cover from power connection box.

m. Tag and disconnect input power wires.

n. Remove power cable connector and cable.

o. Remove rear electronics enclosure cover.

p. Remove clamp foot pedal (paragraph 5-16.10).

q. Reinstall rear electronics enclosure cover.

r. Remove clamp foot pedal cover.

s. Remove center mounting bolts from floor mounts.

t. Lay sheets of metal along the floor lengthwise in a path for use by the hydraulic pallet.

u. Place the forks under the center of the paper cutter.

WARNING

Serious injury may occur if inadequate number of personnel are used to move the paper cutter. This equipment weighs 4083 lbs.

v. Raise paper cutter up.

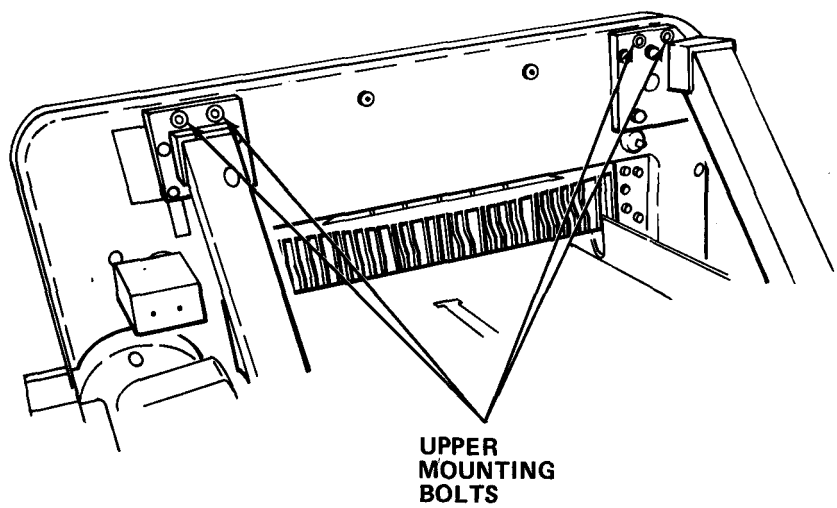
w. Push paper cutter to the rear of the van as far as possible.

x. Using a crowbar, lower the clamp and insert a board on top of the clamp; then release the clamp.

y. Using a forklift, place a piece of board across the forks and move the forks under the clamp.

z. Place rags along the table where the forks are to prevent damage to the table.

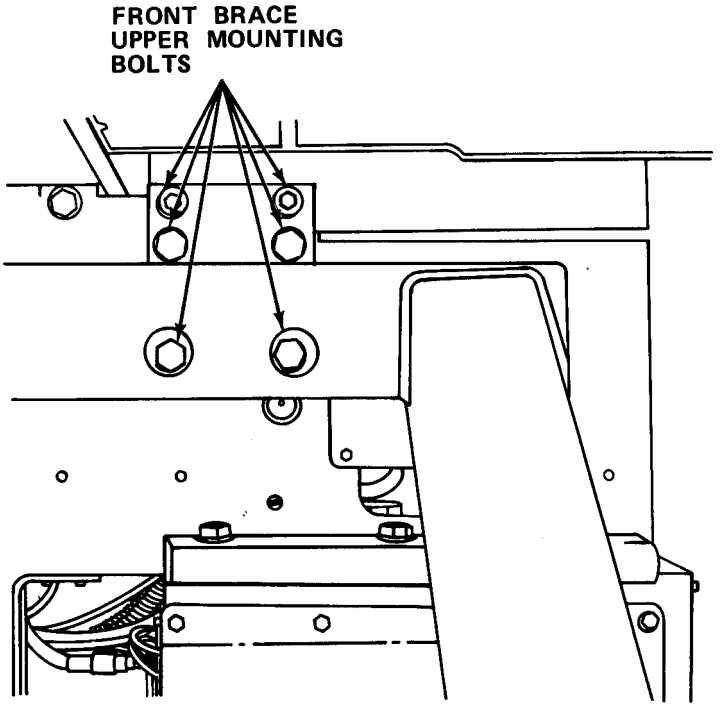
aa. Lift the paper cutter up with the forklift and remove the paper cutter



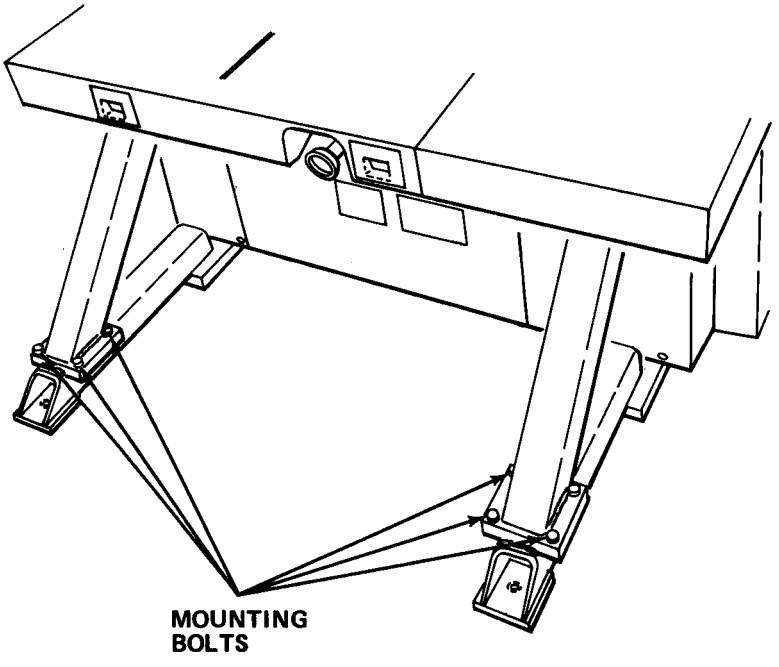
ab. Remove upper mounting bolts from rear brace.

ac. Remove mounting bolts from sides of table.

ad. Remove rear brace mounting bolts and remove rear brace.

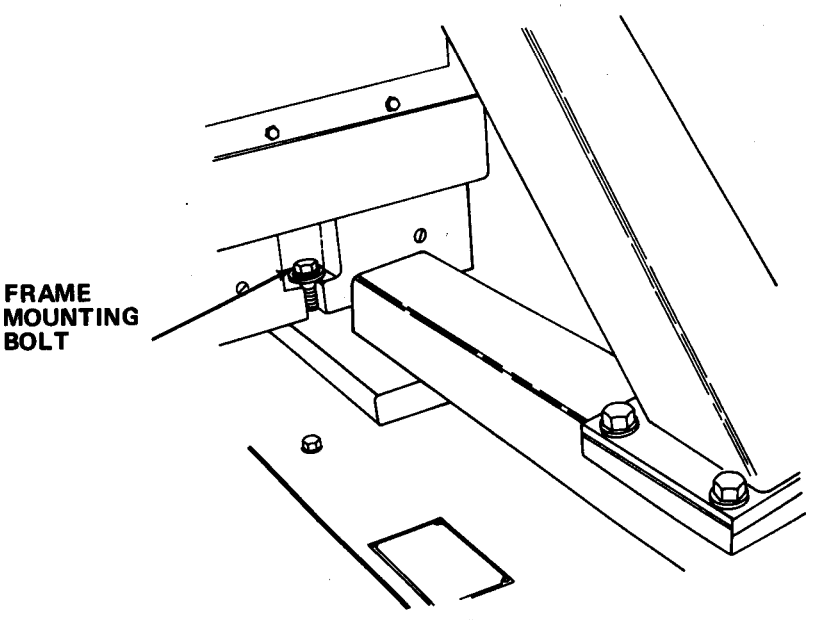


ae. Remove front brace upper mounting bolts.



af. Remove lower front brace mounting bolts and brace.

ag. Remove front electronics enclosure cover.



ah. Remove right pillar cover.

ai. Remove frame mounting bolts.

aj. Reinstall right pillar cover.

ak. Remove HP card cover.

al. Remove frame mounting bolts.

am. Reinstall HP card cover.

an. Reinstall front electronics enclosure cover.

ao. Repeat steps y. through aa. to lift defective paper cutter off of support frame. Be sure to insert backgauge table support leg before setting defective paper cutter down.

ap. Using a crow bar, lower clamp and remove wood board.

aq. Refer to Service Upon Receipt for assembly of new paper cutter (paragraph 5-13).

ar. Using a crow bar, lower clamp of new paper cutter and insert a wood board; then release clamp.

as. Remove rear electronics enclosure cover.

at. Remove clamp foot pedal (paragraph 5-16.10).

au. Remove clamp foot pedal cover.

av. Reinstall rear electronics enclosure cover.

WARNING

Serious injury may occur if inadequate number of personnel are used to move the paper cutter. This equipment weighs 4083 lbs.

aw. Repeat steps y. through aa. to lift new paper cutter onto support frame. Be sure to insert backgauge table support leg before setting new paper cutter down.

ax. Remove front electronics enclosure cover.

ay. Remove right pillar cover.

az. Install frame mounting bolts.

ba. Reinstall right pillar cover.

bb. Remove HP card cover.

bc. Install frame mounting bolts.

bd. Reinstall HP card cover.

be. Reinstall front electronics enclosure cover.

bf. Install lower front brace and secure with lower mounting bolts.

bg. Install upper front brace mounting bolts.

bh. Install rear brace and secure with lower mounting bolts.

bi. Install mounting bolts on sides of table.

bj. Install upper mounting bolts on rear brace.

bk. Repeat steps y.-aa. and place new paper cutter into van.

bl. Using crow bar, lower clamp and remove wood board.

bm. Repeat steps t.-v.and push paper cutter to front of van, alining mounting bolt holes.

bn. Install mounting bolts.

bo. Remove rear electronics enclosure cover.

bp. Install clamp foot pedal (paragraph 5-16.10).

bq. Reinstall rear electronics enclosure cover.

br. Reinstall foot pedal cover.

bs. Install power cable and connector.

bt. Reconnect input power wires.

bu. Remove sheets of metal.

bv. Install all tiedowns.

bw. Reinstall all loose objects and strapped down material.

bx. Reinstall shock mounts for paper shredder.

by. Reinstall photolithographic cabinet (paragraph 8-16.3).

bz. Reinstall roadside wall storage cabinets (paragraph 8-16.2).

ca. Reinstall photolithographic cabinet (paragraph 8-16.4).

cb. Reinstall book and pamphlet stitcher (paragraph 3-16.10).

cc. Reinstall paper drilling machine (paragraph 2-16.7).

cd. Reinstall bindery table (paragraph 8-16.1).

ce. Reinstall paper shredder (paragraph 4-20.10).

5-20.19 Adjust Clamp Foot Pedal Pressure.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required to perform this procedure.

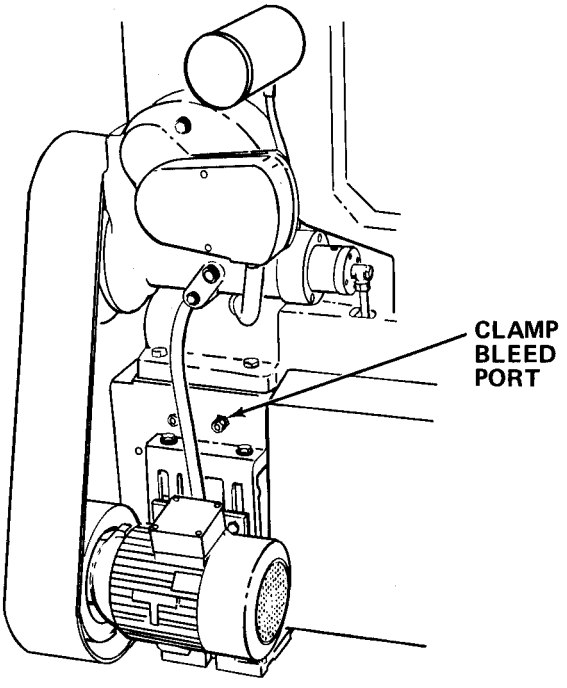
TOOLS: Flat Tip Screwdriver
22 mm Combination Wrench
19 mm Combination Wrench
6 mm Hex Head Key Wrench
Manometer

a. Turn on power.

(1) Using operator key, unlock safety lock.

(2) Turn main power switch to I position and allow the paper cutter to run for 30 minutes to stabilize hydraulic fluid temperature.

b. Turn main power switch to O position.

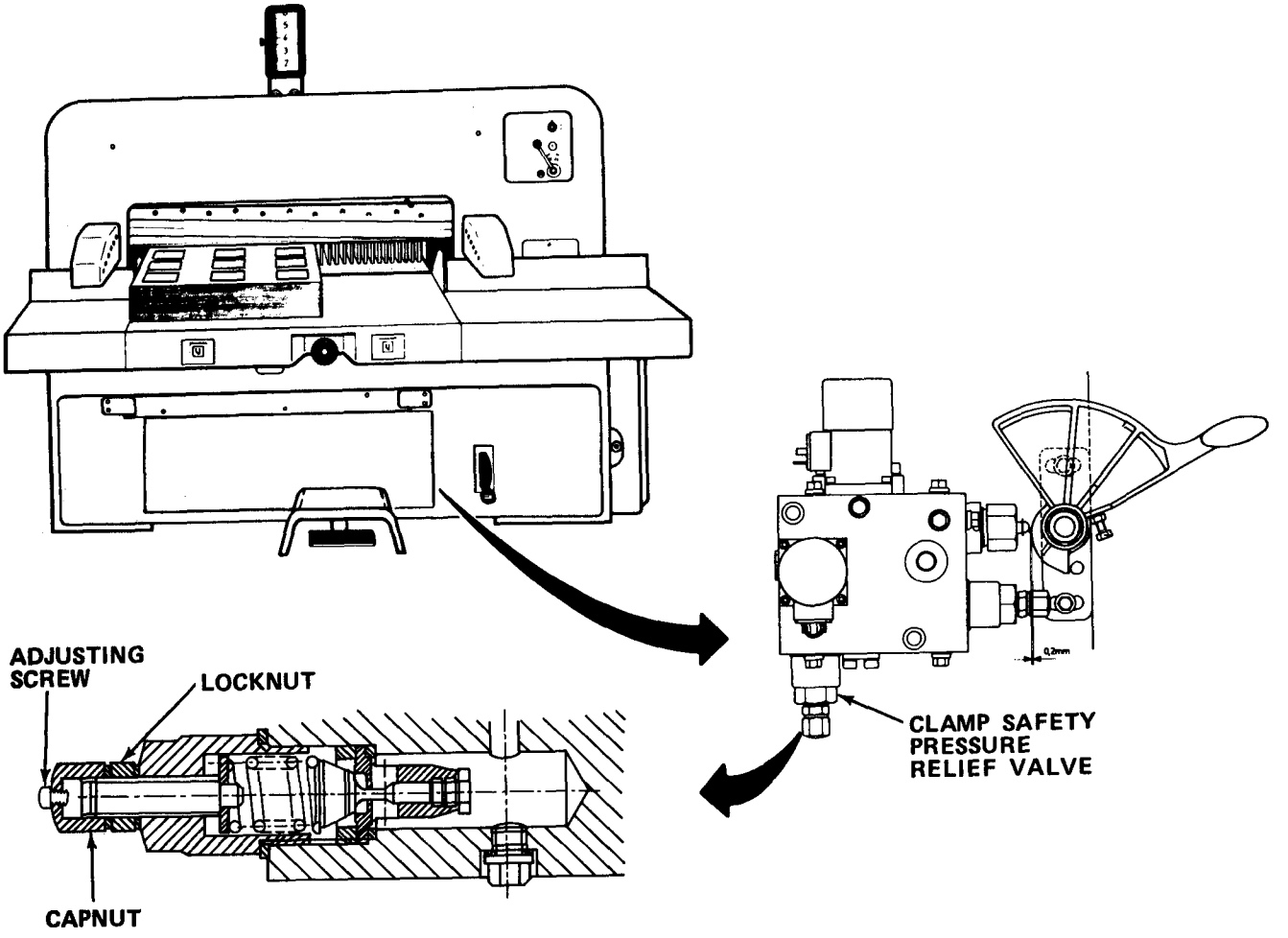


c. Remove bleed cap from clamp bleed port and connect manometer to bleed port.

d. Turn main power switch to I position.

e. Press control power on switch.

f. Press and hold down the clamp foot pedal and observe the reading on the manometer. If pressure is not 21 bar (298 psi) adjust clamp safety pressure relief valve as follows:



(1) Remove front electronics enclosure cover and right pillar cover.

(2) Remove capnut from clamp safety pressure relief valve.

(3) Loosen locknut and rotate hex socket adjusting screw right to increase pressure or left to decrease pressure.

(4) Repeat step f. as necessary until pressure is 21 bar (298 psi).

(5) Tighten locknut on clamp safety pressure relief valve.

(6) Reinstall capnut.

(7) Reinstall front electronics enclosure cover and right pillar cover.

g. Turn main power switch to O position.

h. Remove manometer from bleed port.

i. Reinstall bleed port cap onto bleed port.

5-20.20 Adjust Clamp Pressure.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required to perform this procedure.

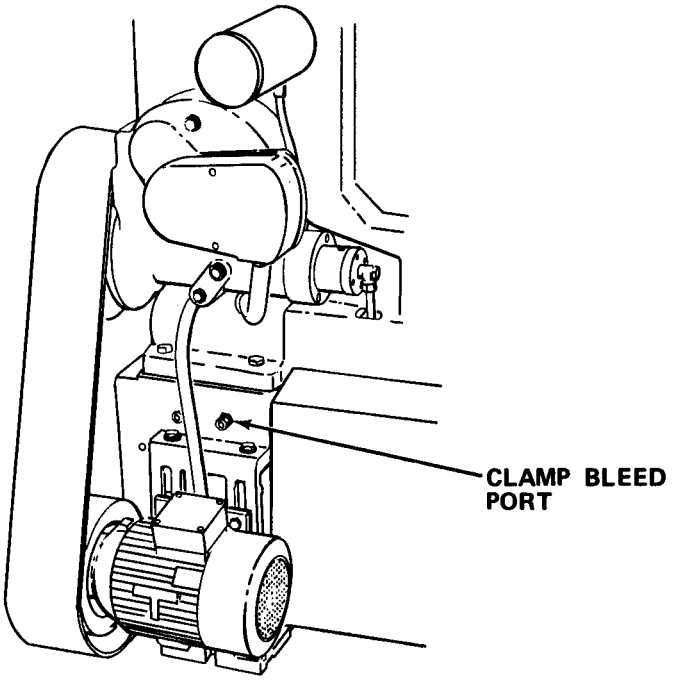
TOOLS: Flat Tip Screwdriver
22 mm Combination Wrench
10 mm Combination Wrench
6 mm Hex Head Key Wrench
Manometer

a. Turn on power.

(1) Using operator key, unlock safety lock.

(2) Turn main power switch to I position and allow the paper cutter to run for 30 minutes to stabilize hydraulic fluid temperature.

b. Turn main power switch to O position.



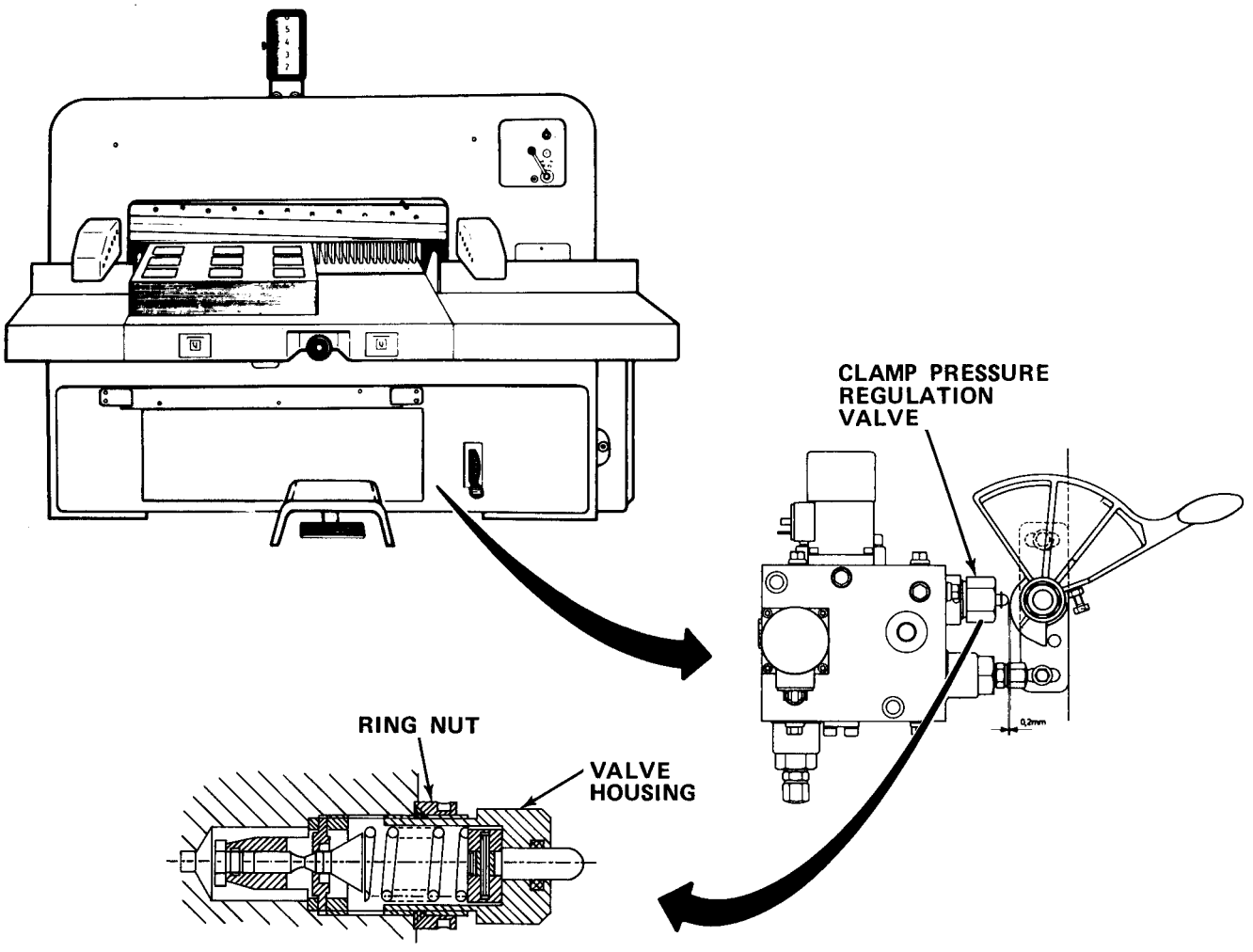
c. Remove bleed cap from clamp bleed port and connect manometer to bleed port.

d. Turn main power switch to I position.

e. Press control power on switch.

f. Set clamp pressure control to minimum pressure.

g. Perform a cut and observe the reading on the manometer. If pressure is not 32 bar (455 psi), adjust clamp pressure as follows:



(1) Remove front electronics enclosure cover and right pillar cover.

(2) Loosen the ring nut around the valve (behind the plunger).

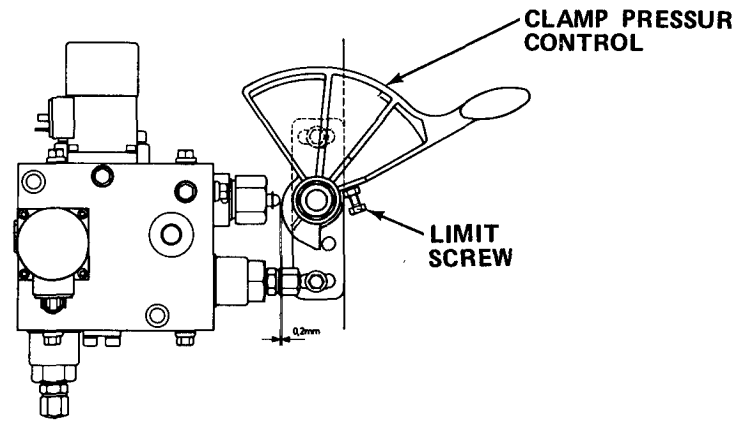
(3) Adjust the valve housing in for more pressure or out for less pressure.

(4) Tighten the ring nut around the valve.

(5) Repeat step g. until pressure is 32 bar (455 psi).

h. Set clamp pressure control to maximum pressure.

i. Perform a cut and observe the reading on the manometer. If pressure is not 130 bar (1848 psi), adjust clamp pressure as follows:



(1) Remove front electronics enclosure cover and right pillar cover.

(2) To increase pressure, tighten the limit screw on the bottom of the clamp pressure control. To decrease pressure, loosen the limit screw.

(3) Repeat step i. until pressure is 130 bar (1848 psi).

j. Reinstall front electronics enclosure cover and right pillar cover.

k. Turn main power switch to O position.

l. Remove manometer from bleed port.

m. Reinstall bleed port cap onto bleed port.

5-20.21 Adjust Clutch Pressure.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required to perform this procedure.

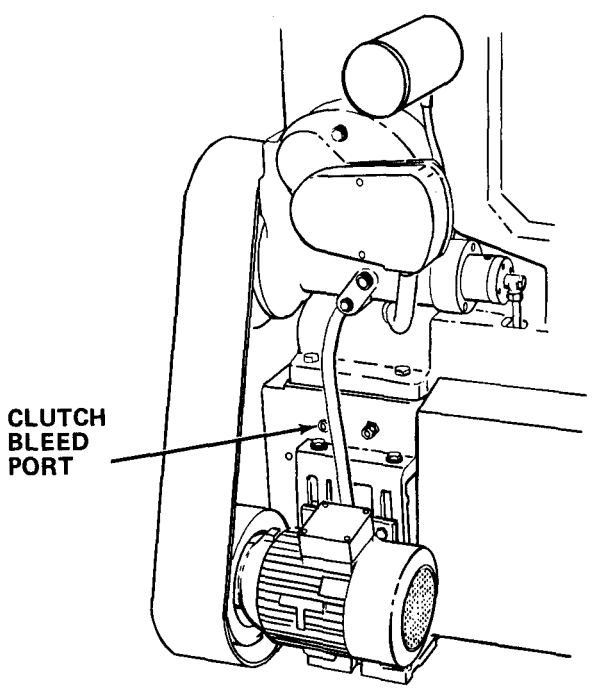
TOOLS: Flat Tip Screwdriver
22 mm Combination Wrench
19 mm Combination Wrench
6 mm Hex Head Key Wrench
Manometer

a. Turn on power.

(1) Using operator key, unlock safety lock.

(2) Turn main power switch to I position and allow the paper cutter to run for 30 minutes to stabilize hydraulic fluid temperature.

b. Turn main power switch to O position

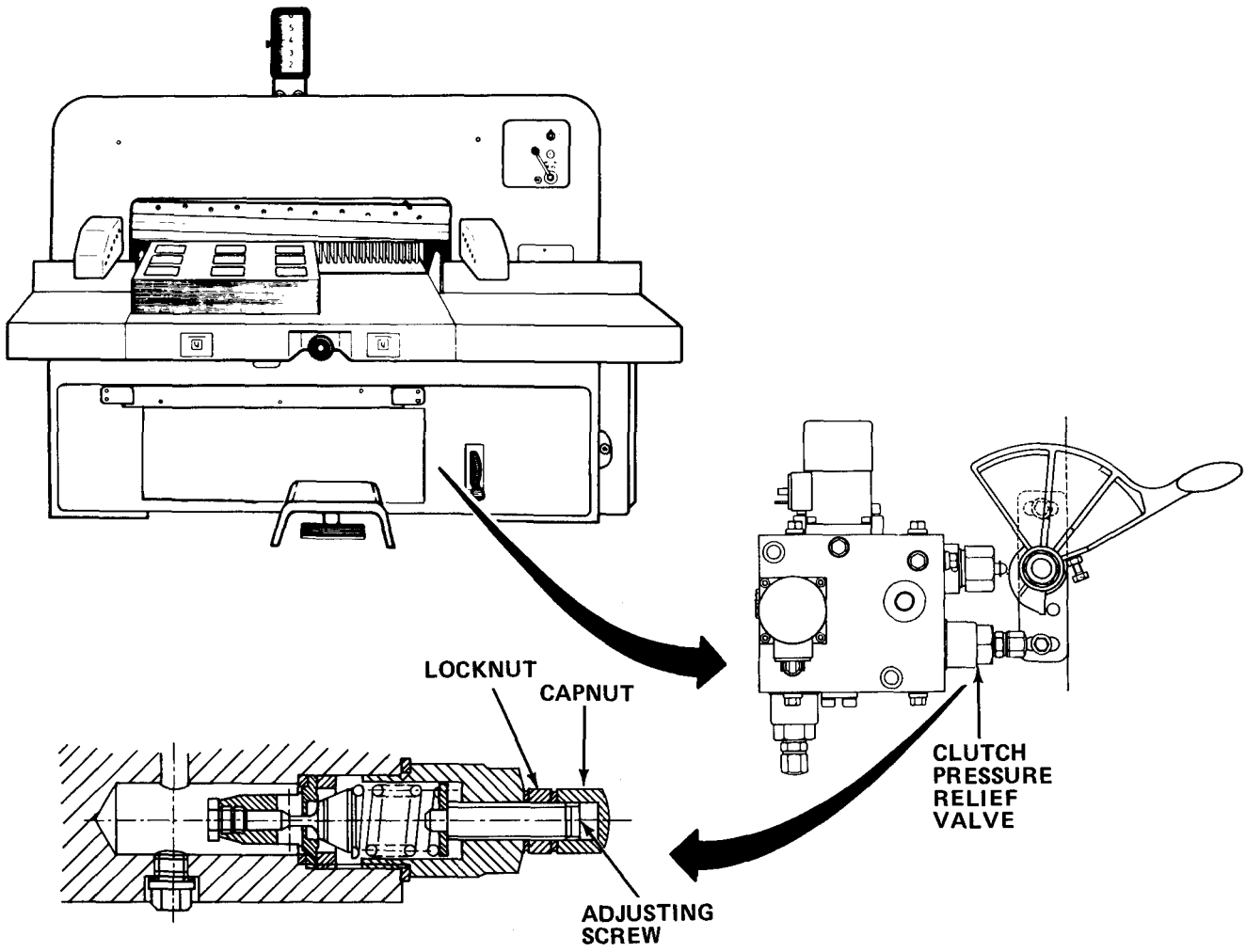


c. Remove bleed cap from clutch bleed port and connect manometer to bleed port.

d. Turn main power switch to I position.

e. Press control power on switch.

f. Perform a cut and observe the reading on the manometer. If pressure is not 65 bar (925 psi) adjust clutch pressure relief valve as follows:



(1) Remove front electronics enclosure cover and right pi llar cover.

(2) Remove capnut from clutch pressure valve.

(3) Loosen locknut and rotate hex socket adjusting screw right to increase pressure or left to decrease pressure.

(4) Repeat step f. as necessary until pressure is 65 bar (925 psi).

(5) Tighten locknut on clutch pressure valve.

(6) Reinstall capnut.

(7) Reinstall front electronics enclosure cover and rightpillar cover.

g. Turn main power switch to O position.

h. Remove manometer from bleed port.

i. Reinstall bleed port cap onto bleed port.

5-20.22 Adjust Clamp Guiding.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 9 mm Combination Wrench
19 mm Socket with 3/8 in. Drive
3/8 in. Drive Ratchet

SUPPLIES: Spacer Foils

a. Turn on power.

(1) Using operator key, unlock the safety lock.

(2) Turn main power switch to I position.

(3) Press the control power on switch.

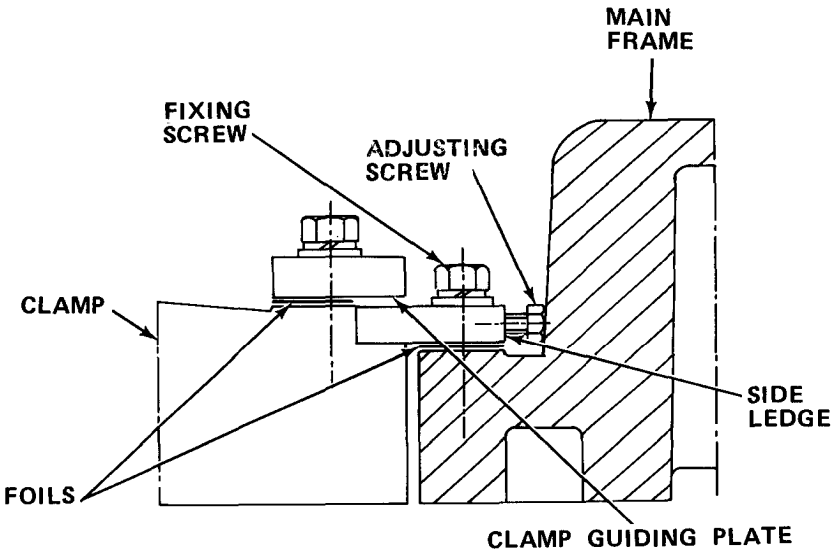
b. Using the clamp foot pedal, lower the clamp onto the table.

WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

c. Be sure that the clamp is parallel to the table. If not, adjust clamp connecting rod to make the clamp parallel (paragraph 5-16.26).

d. Perform several clamping operations using the foot pedal. If the guiding of the clamp is still too stiff, continue or go to step i.



e. Add foils behind the guiding plate until the clamp moves freely without play.

f. Adjust the side ledge by loosening the fixing screw and rotating the adjusting screw; then tighten the fixing screw.

g. Perform several clamping operations using the foot pedal. Check for drag marks on the clamp surface along the side ledge. If present, add foils behind the side ledge.

h. If foils were added, check the clearance between the knife and the clamp by performing procedure 5-20.1.

i. Turn main power switch to O position.

5-20.23 Bleed the Hydraulic System.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
22 mm Combination Wrench
10 mm Combination Wrench
Flashlight

SUPPLIES: Rags (Item 21, Appendix E)
Hydraulic Fluid (Item 12, Appendix E)

NOTE

Steps a. through d. are completed with power off.

a. Remove front electronics enclosure cover and right pillar cover.

b. Remove main motor V-belt cover.

c. Remove side reservoir cover plate and gasket.

d. Place rags around electronics to protect them from possible hydraulic fluid splash.

e. Turn on power.

(1) Using operator key, unlock the safety lock.

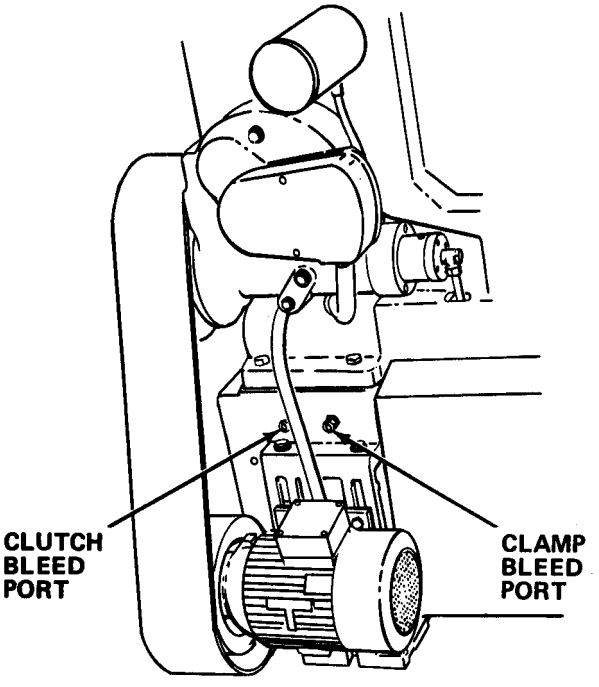
(2) Turn main power switch to I position.

(3) Press control power on switch.

WARNING

Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.

f. Perform three cutting cycles.



g. Loosen the capnut on the bleed port for clamp.

h. While performing cutting cycles, press the ball away from the seating. Hydraulic fluid should flow out until it is not foamy. Immediately retighten the capnut.

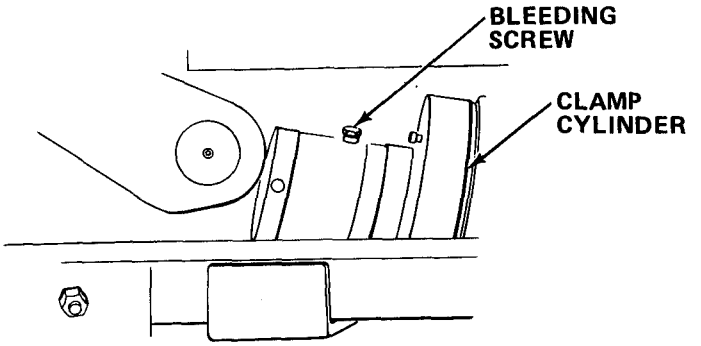
i. Loosen the capnut on the bleed port for the clutch.

j. While performing cutting cycles, during the downstroke of the knife, press the ball away from the seating. Hydraulic fluid should flow until it is not foamy. Immediately retighten the capnut.

k. While performing a cutting cycle, loosen the bleeding bolt on the backside of the clutch assembly during the knife downstroke to bleed the hydraulics.

l. Tighten the bolt during the upstroke of the knife.

m. Repeat steps k. and l. until no more air bubbles are present in the hydraulics.



n. On the clamp piston, locate the bleeding screw and rotate the piston so that easy access to the bleeding screw is obtained.

o. Barely loosen the screw so that slow bleeding occurs. Do not allow fluid to enter the electronics enclosure.

WARNING

Keep hands clear of piston when operating the foot pedal. The piston will raise and injury may occur.

p. Press down on the clamp foot pedal and hold.

q. Using a drip pan, let the fluid flow out of the bleeding screw with the piston in the out position until it is free of air bubbles.

r. Retighten the bleeding screw.

WARNING

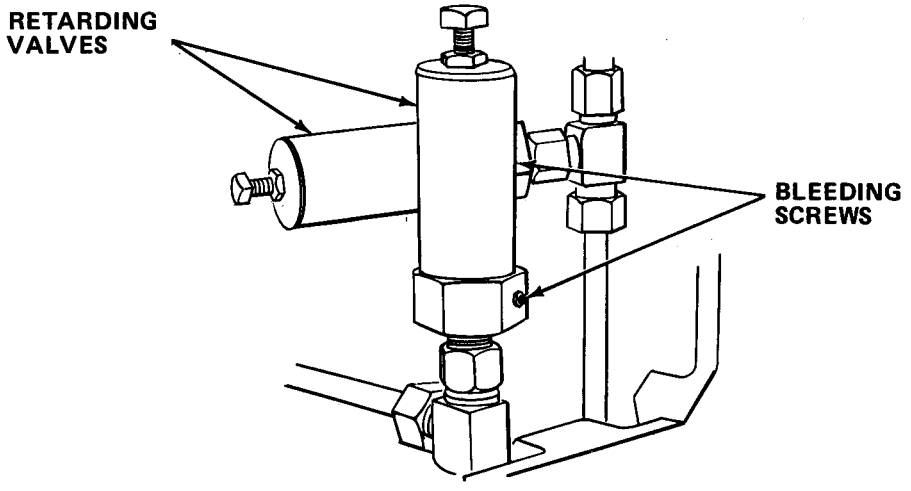
Before releasing the clamp foot pedal, be sure all objects are clear of piston and angle linkage. Serious injury may occur.

s. Release the clamp foot pedal.

t. Rotate piston so that the bleeding screw is back in its original position.

WARNING

Use care when working around moving V-belts. Death or serious injury may occur.



u. Loosen the bleeding screw on the retarding valves and while performing a cut, bleed each retarding valve. Tighten the bleeding screw after the knife reaches the bottom of its stroke.

v. Using a flashlight, check the fluid reservoir for air bubbles.

w. If air bubbles or foam are present, this is an indication of a leaking pipe or fitting. Retighten fittings.

x. Turn off power.

(1) Turn main power switch to O position.

(2) Using operator key, lock the safety lock.

y. Remove all rags around undersides of cutter.

z. Reinstall side reservoir cover plate and gasket.

aa. Reinstall main motor V-belt cover.

ab. Reinstall front electronics enclosure cover and right pillar cover.

5-20.24 Replace Main Circuit Breakers.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdrivers
5 mm Hex Head Socket Bit with 3/8 in. Drive Ratchet
4 in. Extension

SUPPLIES: Circuit Breaker (10 amp)

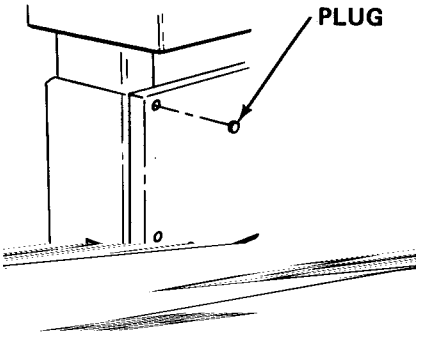
WARNING

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

a. Turn off power.

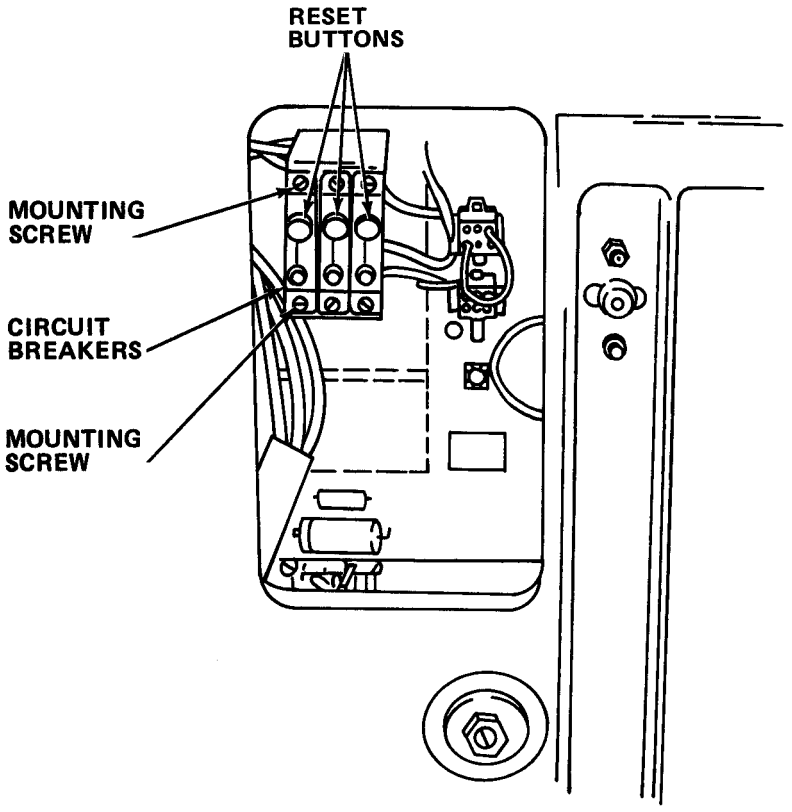
(1) Turn main power switch to O position.

(2) Turn off circuit breaker.



b. Remove plastic plugs covering screw holes on HP card cover panel.

c. Remove mounting screws and cover panel.



d. Remove mounting screws and pull defective circuit breaker out.

e. Tag and disconnect wires.

f. Connect wires to new circuit breaker.

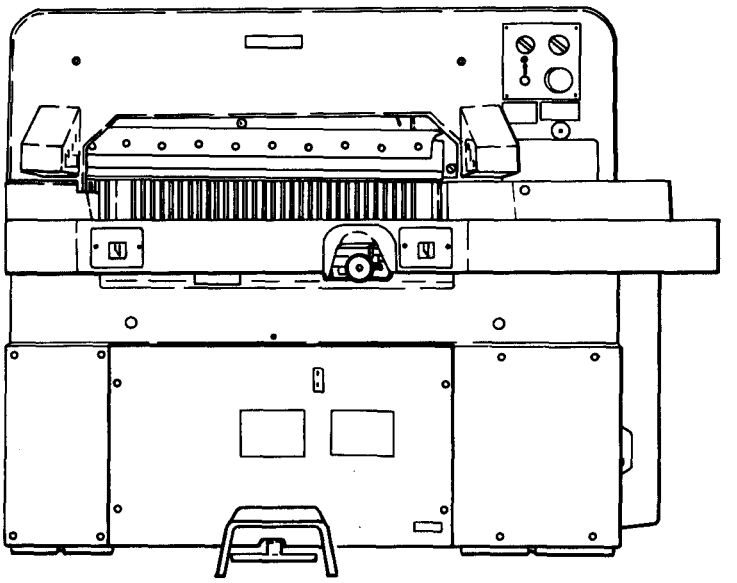
g. Install new circuit breaker and retain with screws.

h. Press reset button in.

i. Reinstall cover panel and retain with screws.

j. Reinstall plastic plugs.

k. Turn on circuit breaker.



92 SD PAPER CUTTER

Section VI INTRODUCTION

5-21. GENERAL INFORMATION.

5-21.1 Reference Information

Nomenclature Cross-Reference List

Official Nomenclature	Common Name
OCL	Optical Cutting Line
LED	Light Emitting Diode
PM	Power Module Unit
PMD	Power Module Distribution Board
PMF	Power Module Fuse Board
PMR	Power Module Rectifier Board
I, O	I implies on, O implies off
LSV	Light Barrier Emitter Side
LS	Light Barrier Receiver Side
MC	Motor Control Unit
IAR	Positioning Computer Interface Board
ML	Motor Logic Board
SCU	Control Unit
PS5	+ 5.1 V Power Supply
PS24	+24 V Power Supply
TAM	Pulse Former for Measurement System

AR	Positioning Computer Board
KK	Monitor Channel Board
HK	Hardware Channel Board
SDA	Measurement Display
NC	Normally Closed
NO	Normally Open

5-22. EQUIPMENT DESCRIPTION.

5-22.1 Equipment Characteristics, Capabilities, and Features.

a. Direct high precision linear scale measuring system.

b. Digital measurement display at eye level.

c. One hand control for setting measurements.

d. Optical cutting line indicator.

e. Replaceable knife.

f. Light barrier interference detector for safety.

g. Two-stage clamping pressure for safety.

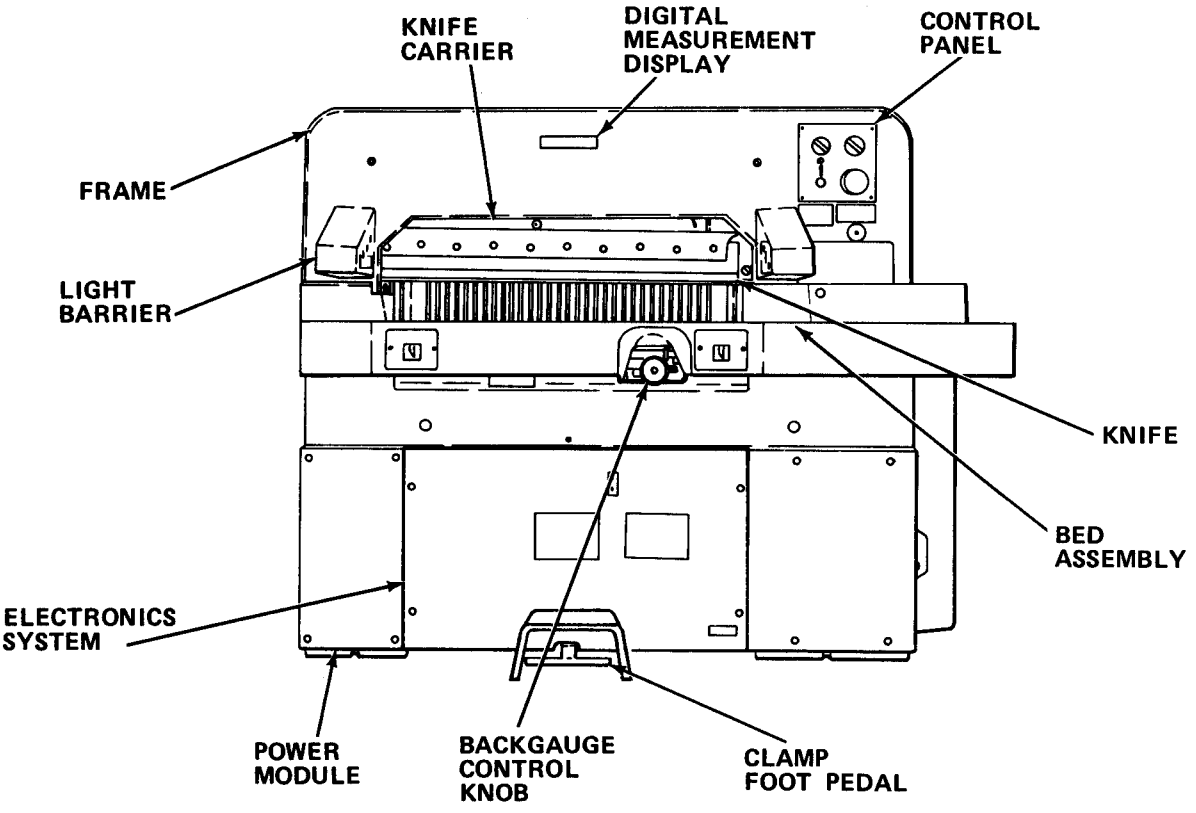
h. Simultaneous two hand operation interlocks.

i. Three-section backgauge rake enables one-time setup for three cuts.

j. Safety bolt to automatically lock knife in its upper position for safety.

k. Built-in diagnostic test.

5-22.2 Location and Description of Major Components.



FRAME. Cast-iron, rigid structure contains all the assemblies.

LIGHT BARRIER. Light beams, if broken, immediately stop downward motion of the knife for safety.

KNIFE CARRIER. Contains and supports knife.

DIGITAL MEASUREMENT DISPLAY. Indicates distance from knife to backgauge.

CONTROL PANEL. Contains on/off controls, clamp pressure control, and knife change control.

KNIFE. Beveled-edge tempered steel blade which performs actual cutting operation.

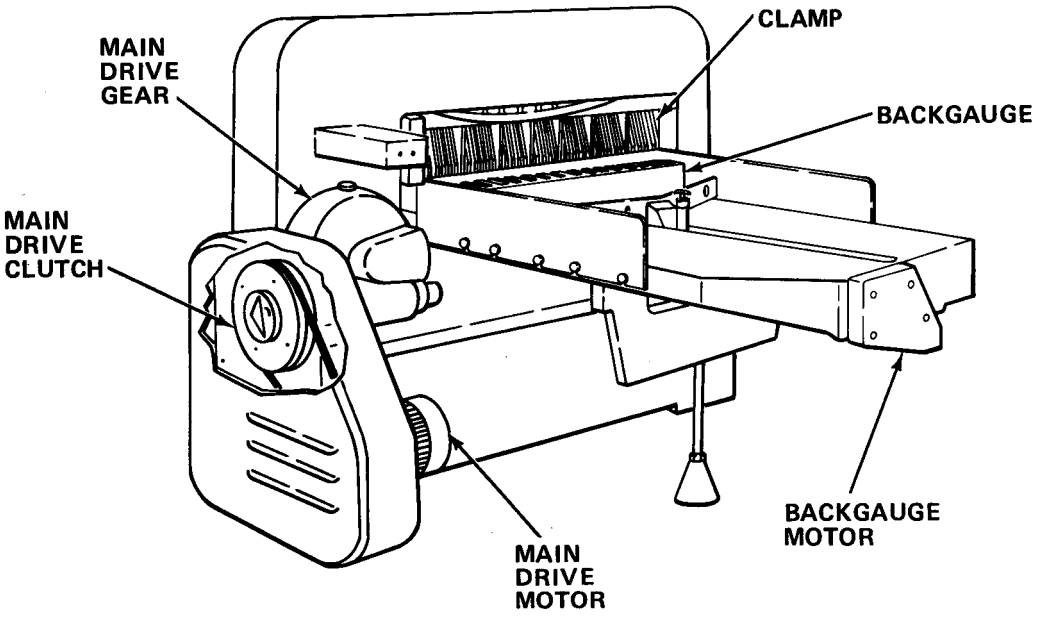
BED ASSEMBLY. Contains backgauge and supports material to be cut.

CLAMP FOOT PEDAL. Controls the clamp.

BACKGAUGE CONTROL KNOB. Controls the forward and backward motion of the backgauge.

POWER MODULE. Contains all components that supply the power required by the machine.

ELECTRONICS SYSTEM. Controls electronic signals for operation of the machine.



MAIN DRIVE CLUTCH. Engages main drive gear to perform the cut.

MAIN DRIVE GEAR. Drives knife carrier to perform cut.

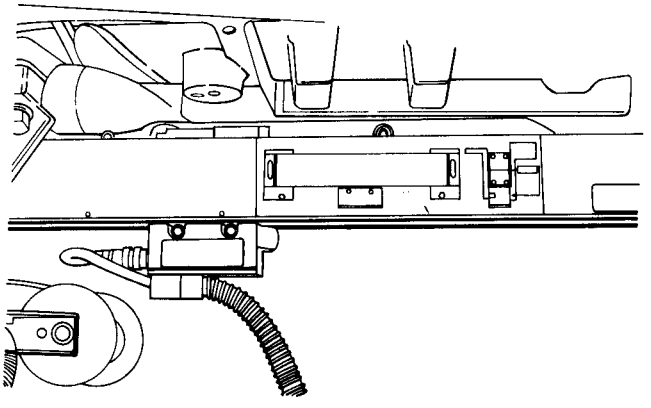
CLAMP. Forces air from between layers of paper to ensure smooth, even cut.

BACKGAUGE. Moves material to be cut forward or backward in relation to the knife.

BACKGAUGE MOTOR. Powers the backgauge.

MAIN DRIVE MOTOR. Drives the main drive gear clutch assembly and hydraulic pump.

DIRECT LINEAR SCALE MEASUREMENT SYSTEM



DIRECT LINEAR SCALE MEASUREMENT SYSTEM. Measures distance between the backgauge and the knife's cutting line.

5-22.3 Equipment Data.

Cutting Width	92 cm (36 1/4 in.)
Clamp Opening	11 cm (4 5/16 in.)
Feed Depth	92 cm (36 1/4 in.)
Smallest cut without false clamp	2 cm (13/16 in.)
with false clamp	9cm (3 1/2 in.)
Knife Cutting Size Limitations (Recommended)	
Pile Height	6 cm (2 11/32 in.)
Material in front of knife	40 cm (15 3/4 in.)
Material Width	64 cm (25 3/16 in.)
Clamp Pressure Min.	150 daN* (330 lbs)
Max.	3000 daN* (6600 lbs)
Foot Pedal Operation	50 daN* (110 lbs)
Width without side tables	177 cm (70 in.)
with side tables	186 cm (73 1/4 in.)
Length	211 cm (83 in.)
Height	147 cm (58 in.)
Front Table Length	61 cm (24 in.)
Table Height	90 cm (35 1/2 in.)
Net Weight	1860 kg (4100 lbs)
Frame Weight	1162 kg (2556 lbs)
Table Weight	452 kg (994 lbs)
Static Floor Load	815 daN*/m^2 (167 lbs/sq. ft)
Contact Area Load	1.5 daN*/cm^2 (21 lbs/sq. in.)
Power Requirement (main drive)	4.1 Hp (3 kW)

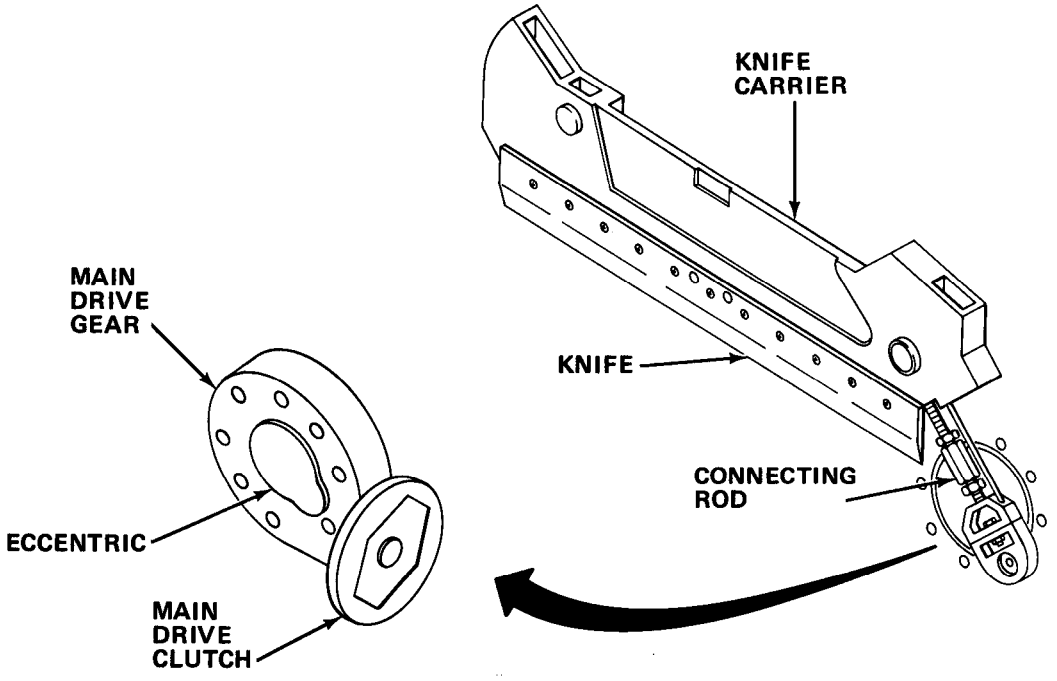
Supply Voltage	190-240 V ac 3 phase
Fusing	25A
Wire cross section	4 mm^2 (0.156 $in.^2$)
Dynamic Surcharge	20%
Knife	
Thickness	11.7 mm (7/16 in.)
Blade angle	22°
Gap between knife and clamp (full pressure on clamp)	.20 - .35 mm (.007 - .013 in.)
Play between knife carrier and frame	.05 mm (.002 in.)
knife carrier and front plate	.05 mm (.002 in.)
Grinding Reserve	3 cm (1 3/16 in.)
Backgauge	
Speed	10 cm/sec (3 15/16 in./sec.)
Overrun	0.3 - 0.6 mm (.012 - .024 in.)
Rake spring tension	Max tightness, then back off 1/2 turn.
With brake disengaged, the gap between brake disc and clutch lining	0.15 - 0.25 mm (.006 - .009 in.)
Moment of force, torque	8 Nm (70.8 lbf in.)
Brake impulse	4 Nm (35.4 lbf in.)
Gear Assembly	
Teeth play (at outside circumference of drive wheel)	70 mm (2 49/64 in.) Max
Hydraulics	
Oil capacity	17 L (4.48 gal)
Oil operating temperature	40° - 50°C (104°- 122°F)

Change over pressure (knife changing)	30 - 32 bar (427 - 455 psi)
Clutch pressure	65 bar (924 psi)
Clamp pressure min.	30 - 32 bar (427 - 455 psi)
max.	115 bar (1636 psi)
Safety pressure (foot pedal operations)	16 bar (227 psi)
Electronics	
Digital signal levels	
"1" or "True"	5.1 V dc
"0" or "False"	0 - 1.5 V dc
Light barrier receiver voltage	
uninterrupted	150 mV ac min.
interrupted	0 volts
Emitter voltage	1 V dc

*daN ≈ kp

5-23. TECHNICAL PRINCIPLES OF OPERATION. The function of the paper cutter is to cut multiple thickness of paper or simi lar materials. It is comprised of:

5-23.1 Knife Assembly. Performs the actual cutting. It is comprised of:



a. Main drive clutch. Controlled by the hydraulic system. Couples the main drive gear to drive motor and drives the knife. Brakes stop the main drive gear when hydraulic pressure is released.

b. Main drive gear. Converts high rpm from the clutch to low rpm at the eccentric.

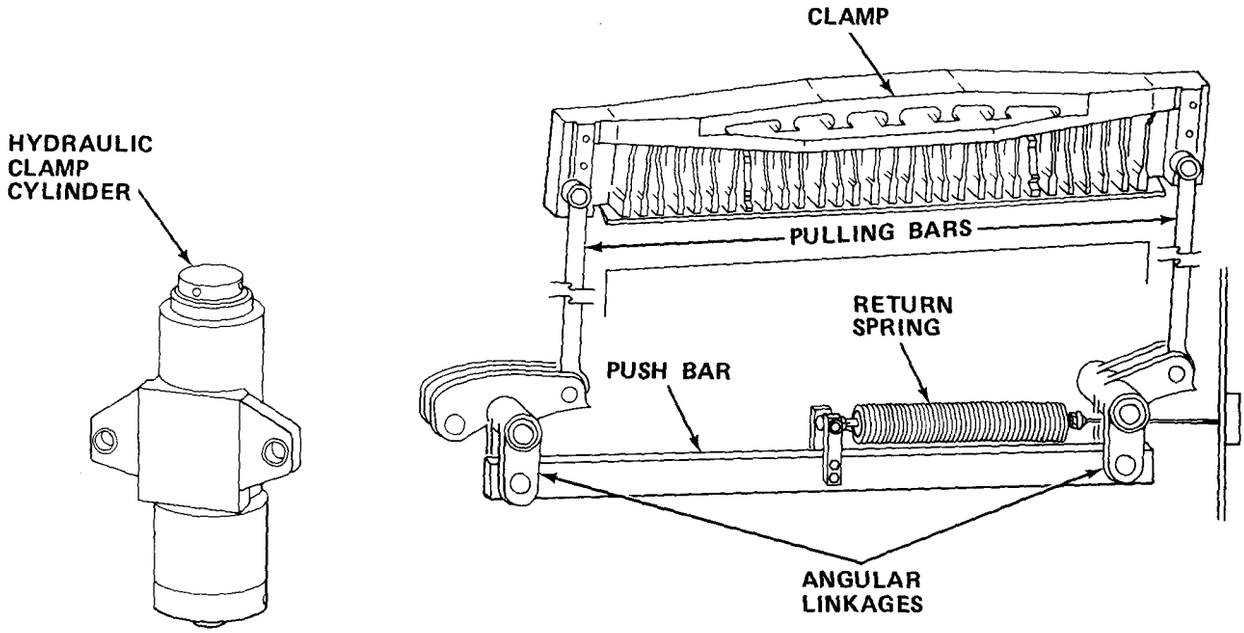
c. Eccentric. Converts rotary motion from the main drive gear into linear motion.

d. Connecting rod. Linkage between the eccentric and the knife carrier. Pulls the knife downward at a 45° angle to perform the cut. It contains a shear bolt that is designed to break if the knife carrier cannot complete its cut due to jamming.

e. Knife carrier. A cast-iron structure which supports the knife. It rides in two machined grooves which give it a shearing motion when pulled down by the connecting rod.

f. Knife. A beveled-edge, tempered-steel plate that is mounted to the knife carrier and performs the actual cut.

5-23.2 Clamp Assembly. Hydraulically activated. Clamps material tightly to force air out and hold in position for cutting. It is comprised of:



a. Clamp. Presses and holds the material. Located adjacent to the knife. Moves up and down. Returns to starting position by means of a spring fitted to the push bar. Clamp rides in adjustable side guides.

b. Hydraulic clamp cylinder. Pushes the clamp downward via a system of angular linkages and pulling bars. Protrudes from right bottom side of the machine and presses the right angular linkage. (paragraph 5-23.5e)

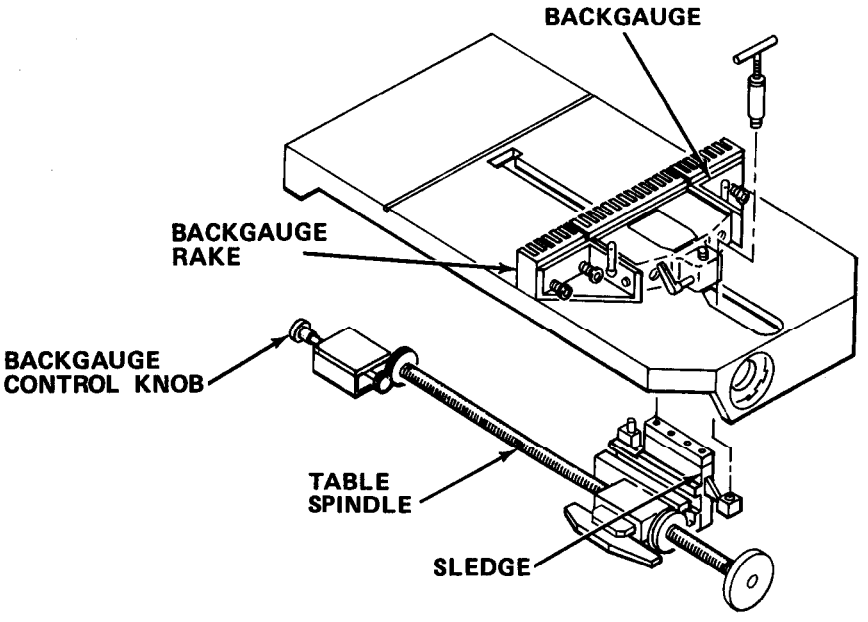
c. Angular linkages. Control downward motion of the clamp. Connected to the clamp via two pull bars. The other side of the linkages are connected to the push bar. The hydraulic clamp cylinder pushes up on the right angular linkage. This forces the push bar to move to the right, linkages pull the pulling bars and the clamp down via the pivots.

d. Push bar. Transmits force from right side angular linkage to left side angular linkage.

e. Return spring. Applies force to the push bar to reverse motion of the push bar and pushes the clamp back up. The spring is mounted on an adjustable rod attached to left side of the machine frame. Tension is adjusted via an adjusting nut.

f. False clamp. Provides larger clamp surface to prevent damage to paper.

5-23.3 Backgauge Assembly. Adjusts length and maintains the cutting material parallel to knife. It is comprised of:



a. Table spindle. A threaded rod which moves the sledge in the table. Driven by the backgauge motor, or manually via the backgauge control knob.

b. Sledge. Moves on ground guides in table slot. Driven by the table spindle, it protrudes through the table slot and connects to the backgauge.

c. Backgauge. Rests on the table top. Connected to the sledge and moves with the sledge. Adjustable to maintain parallelism and squareness with cutting knife.

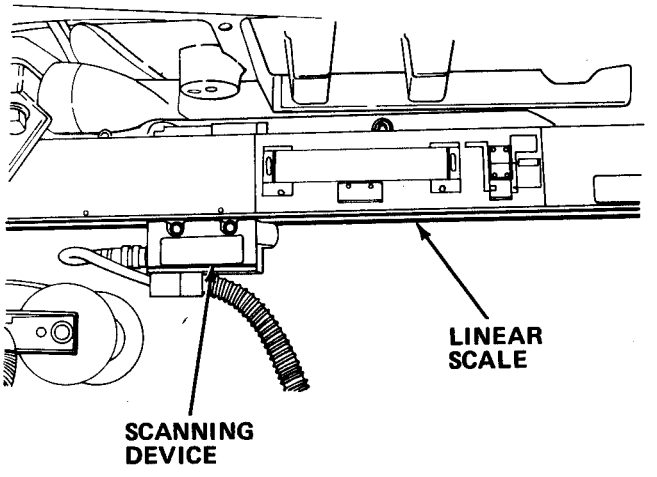
d. Backgauge rake. Three-piece cast structure mounted to the front of the backgauge. Lower sides of the rake are ground at an angle and spring-loaded to prevent material from escaping under the rake's fingers. The left and right rakes are adjustable (forward or backward) to allow for setting of three different measurements at one time.

e. Backgauge control knob. Controls the movement of the backgauge (forward and backward) both electronically and mechanically. Pull knob out or press button in to move the backgauge automatically. When the knob is pressed inward; it engages a gear on the table spindle. Rotating the knob manually rotates a gear which moves the backgauge.

f. Backgauge brake. Rapidly stops the backgauge motor's rotation when the backgauge control knob is released. (paragraph 5-23.6h).

5-23.4 Direct Linear Scale Measurement System. Moves directly with the backgauge to give a direct digital readout of the distance between the backgauge rake and the cutting line. It is comprised of:

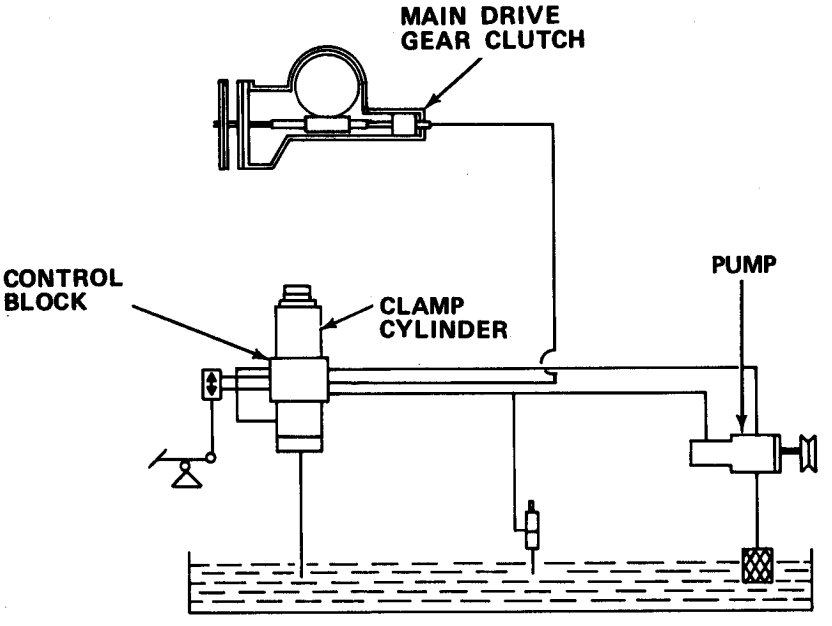
a. LED measurement display. Provides a constant display of the distance between the backgauge rake and the cutting line after the backgauge has been moved across the reference point. The display is accurate to within a hundredth of an inch. The last position of the display indicates the direction of movement of the backgauge. If the backgauge is moving to the rear, a "+" sign is shown. If the backgauge is moving forward, a "-" sign is shown. The LED display also shows error messages when a malfunction is present in the paper cutter.



b. Linear scale. Provides the scanning device with pulse signals. Has a reference mark which is used to reset and insert corrections into the TAM circuits.

c. Scanning device. Picks up electrical signals from the linear scale. It is attached directly to the sledge and moves along the linear scale.

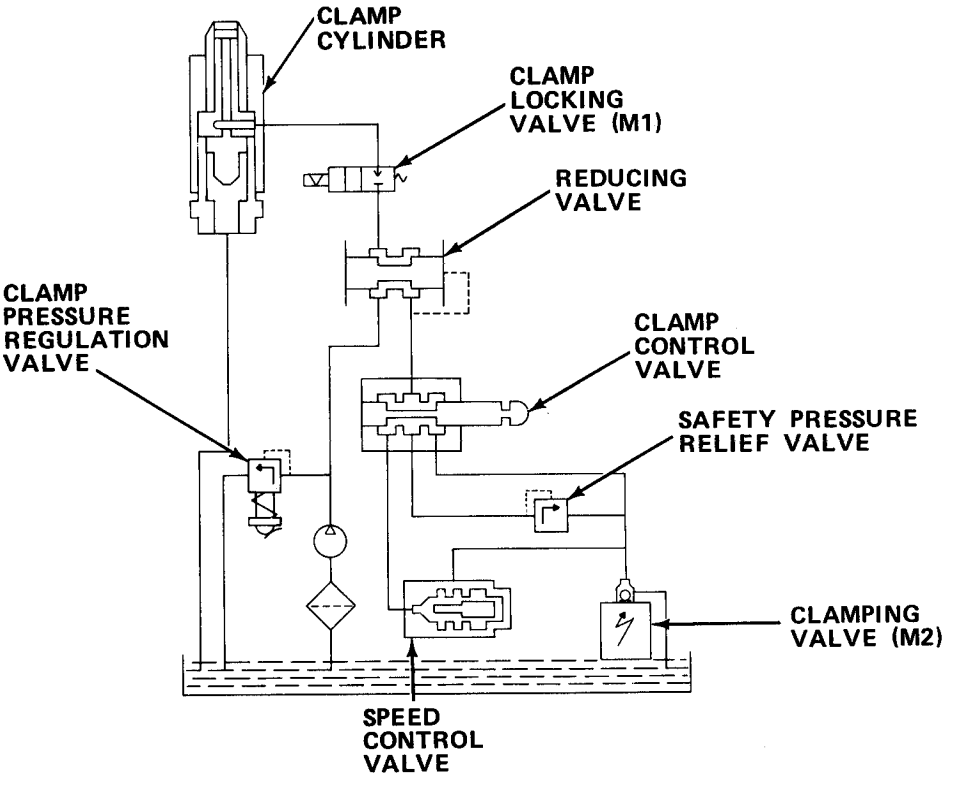
5-23.5 Hydraulic System. Operates hydraulic clamp cylinder and main drive gear clutch. It is comprised of:



a. Pump. Located in the reservoir pillar and driven by the main drive motor through a V-belt and pulleys. The pump draws hydraulic fluid out of the reservoir through a filter and supplies it under pressure to the hydraulic system via two ports, P1 and P2.

b. Control block. Located on the clamp cylinder. The unit consists of two separate control circuits, P1 for the clamp, and P2 for the clutch ram. Each circuit will be discussed separately.

(1) P1. Controls hydraulic fluid for the clamp. It is comprised of:



(a) Safety pressure relief valve. Sets the pressure of P1 pump flow through the control unit during foot pedal operations by opening if a preset pressure is exceeded.

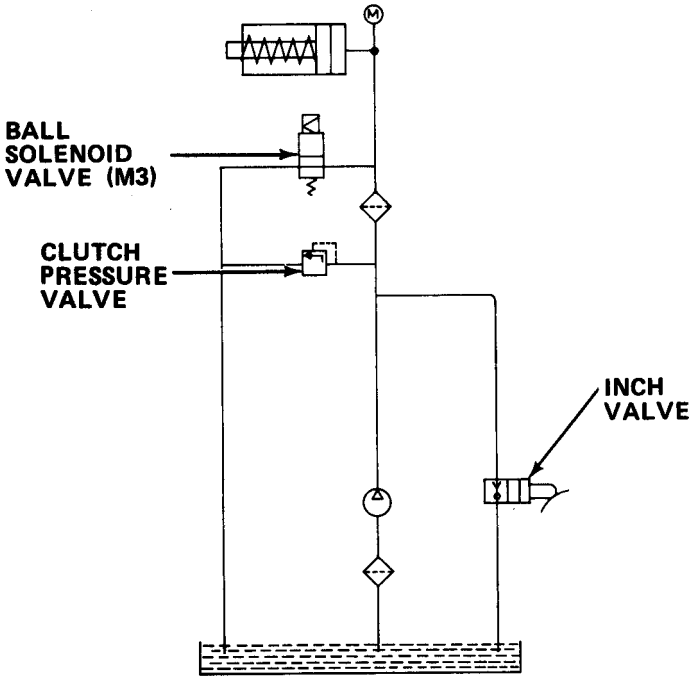
(b) Clamp control valve. Controlled by a cam on the clamp foot pedal. When activated, it restricts P1 pump flow in the control unit to allow the clamp cylinder to extend with a maximum force, not to exceed the safety pressure.

(c) Clamp pressure regulation valve. An adjustable valve controlled by the clamp pressure control knob. Varies the P1 pump flow pressure and, therefore, varies the clamping pressure during cutting operations.

(d) Speed control valve. Controls the clamp speed when using the clamp foot pedal by regulating the return hydraulic flow. Can be adjusted for faster or slower operation.

(e) Reducing valve. Allows for high pressure operations and low pressure operations. The high pressure side allows hydraulic fluid to the clamp cylinder. The low pressure side is used for return flow and idle operations.

(f) Solenoid valves. Two solenoid valves are used in the P1 control circuits. Solenoid valve (M1), referred to as the clamp locking valve, allows hydraulic fluid to flow to the clamp cylinder when energized. When de-energized, it blocks the flow of fluid to the clamp cylinder. Solenoid valve (M2), referred to as the clamping valve, closes the hydraulic circuit P1 when energized and opens the circuit when de-energized, allowing minimal pressure in the P1 circuit.

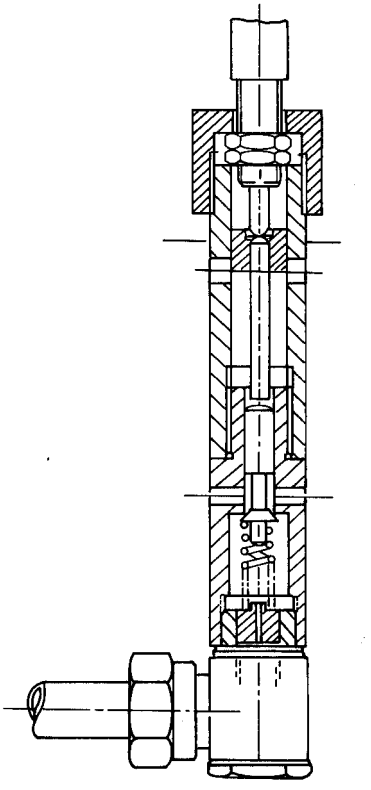


(2) P2. Controls hydraulics for operation of the clutch ram. It is comprised of:

(a) Ball solenoid valve (M3). Referred to as the clutch valve. When energized, allows hydraulic fluid to flow to the clutch ram. When de-energized, directs the flow of hydraulic fluid back to the reservoir.

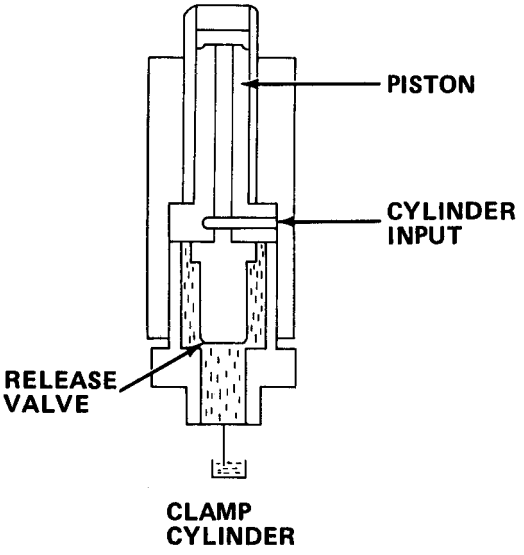
(b) Clutch pressure valve. Is an adjustable valve that sets the pressure for the clutch ram. The valve opens and releases flow if a preset pressure is exceeded.

INCH VALVE



c. Inch valve. The inch valve is used during knife changing. After the clamp has been lowered, solenoid M1, the locking valve, is de-energized by pulling outward on the clamp pressure control knob. This also mechanically opens the inch valve. This reduces the pressure to the clutch ram and allows the knife to be inched down slowly and reduces the wear of the clutch linings.

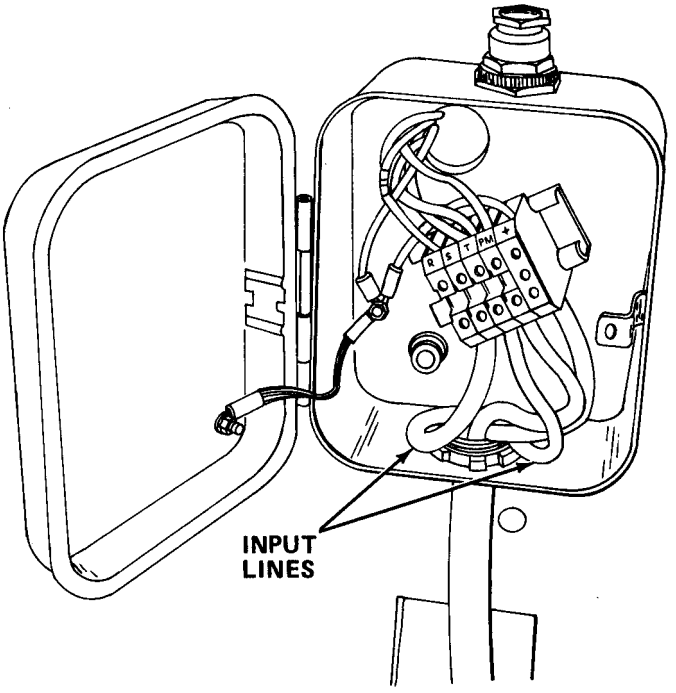
d. Clutch ram. Uses hydraulic fluid pressure from the control block to engage a friction clutch on the drive pulley. This causes rotation of the main drive gear.



e. Clamp cylinder. Converts hydraulic fluid pressure into a linear motion to move the clamp down. Fluid under pressure enters the cylinder input and forces the piston upward. As the clamp begins to press against the material being cut, the pressure on the piston increases, forcing a release valve to close. It allows full pressure to be applied to the piston. Once the cut is complete, the input pressure is decreased. The clamp return spring then forces the piston downward. This forces the release valve to open, allowing the piston to move downward freely and the excess fluid to flow to the reservoir.

5-23.6 Electronic System. Activates, powers and controls the hydraulic and mechanical components of the paper cutter. Refer to Table 5-16 for the sequence of operation of the circuits in response to basic operations. It is comprised of:

a. Power connection box. Supplies 220 V ac, three-phase power to the machine. The machine is hard-wired to a circuit breaker box and protected by a 25 amp circuit breaker.

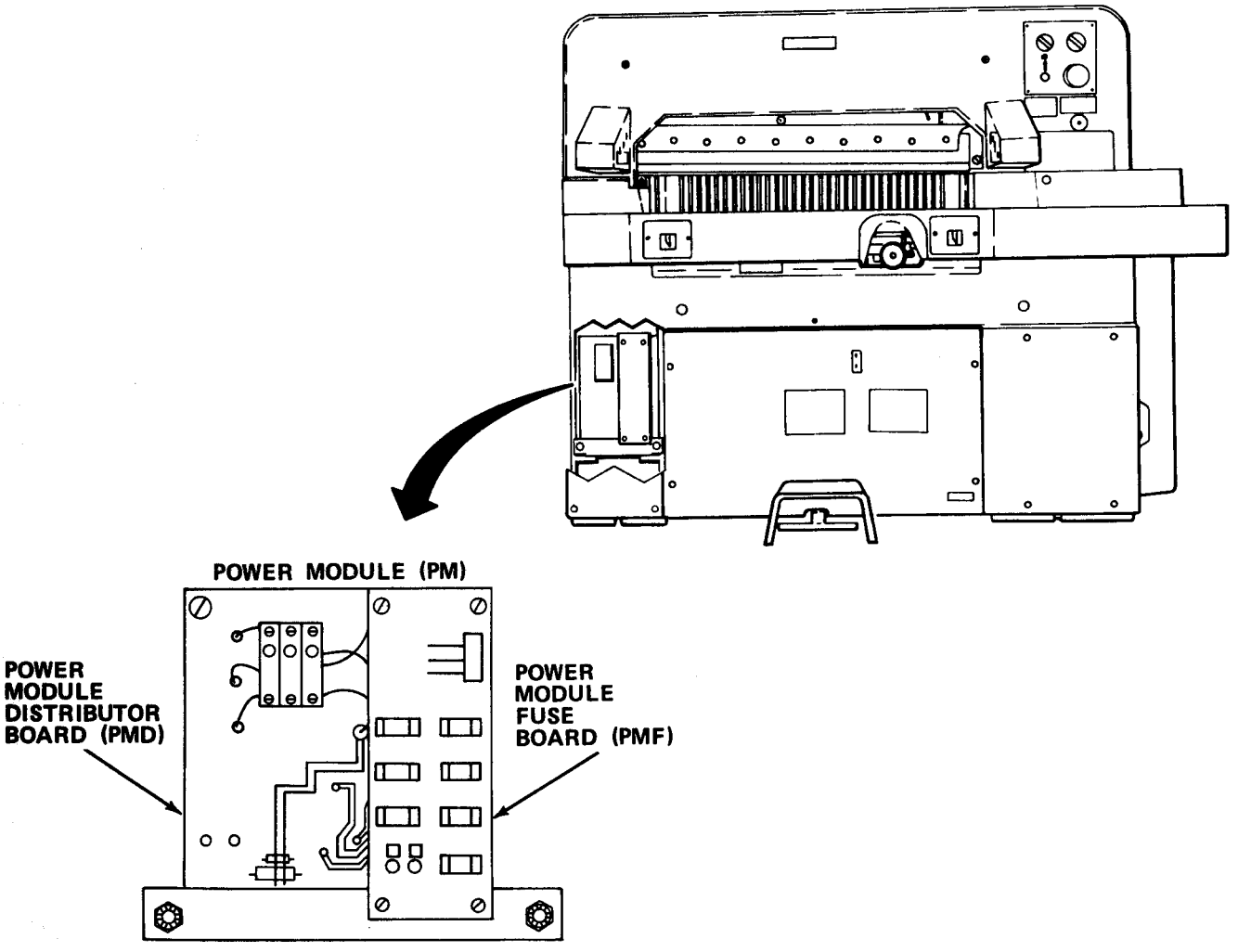


The power connection box contains a terminal block where the input lines, labeled R, S, T, and a ground wire are connected. Wires connected to the other side of the terminal block carry the input power to the power module (PM) via a Star-Delta switch.

NOTE

References in parentheses ( ) refer to the identification for the unit used on the schematics.

b. Power Module (PM). Located in the bottom left side of the machine. Controls the distribution of power within the system. It is comprised of:

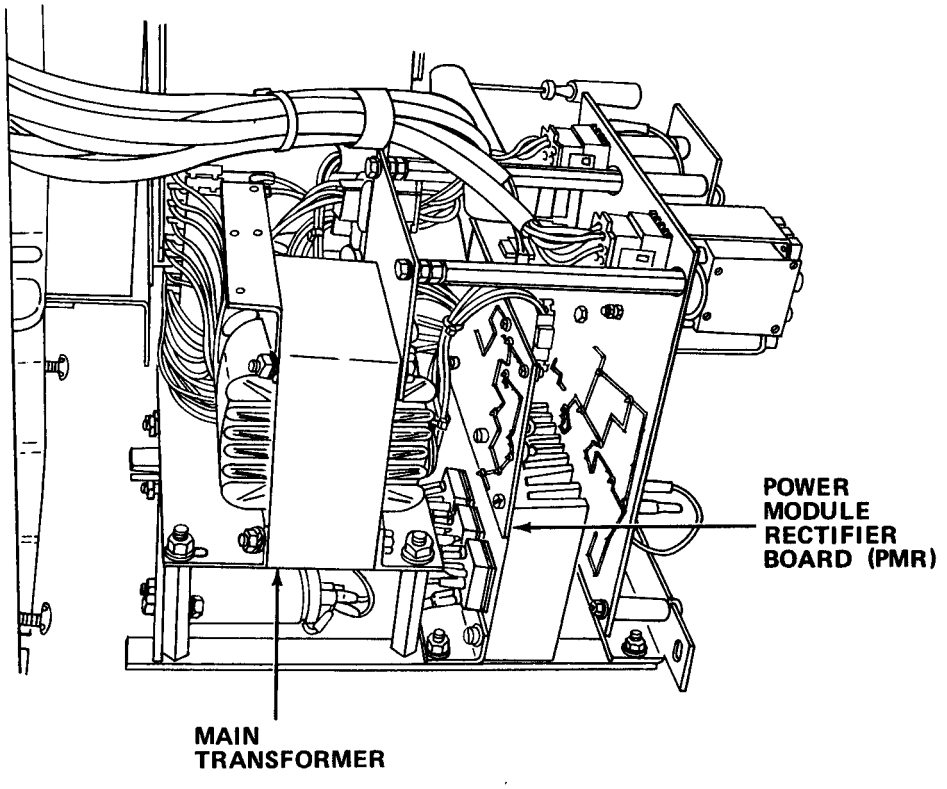


(1) Power module distributor board (PMD). The main power lines coming from the Star-Delta switch enter three 10 amp circuit breakers on the PMD. These circuit breakers protect the backgauge motor, the fluorescent table lamp, and the main transformer. A relay (K304) is used to control the main transformer. This relay is actuated by pressing the control power on switch after the Star-Delta switch has been turned to the " △ " position. The PMD board also consists of three full wave rectifiers, (PM.V1), (PM.V2) and (PM.V3). (PM.V1) is used to convert 40 V ac to 42 V dc for use with solenoids. (PM.V2) is used to convert 11.5 V ac to 9 V dc for use with the power module rectifier board. (PM.V3) is used to convert 32 V ac to 32 V dc for use with the 5.1 and 24 V dc power supplies. Inputs of these rectifiers are from the power module fuse board.

(2) Power module fuse board (PMF). Receives inputs from the main transformer. Contains secondary bus type fuses for protecting various components of the electronic system. (Table 5-10 shows use for each fuse.)

Table 5-10. POWER MODULE FUSE BOARD (PMF) FUSES

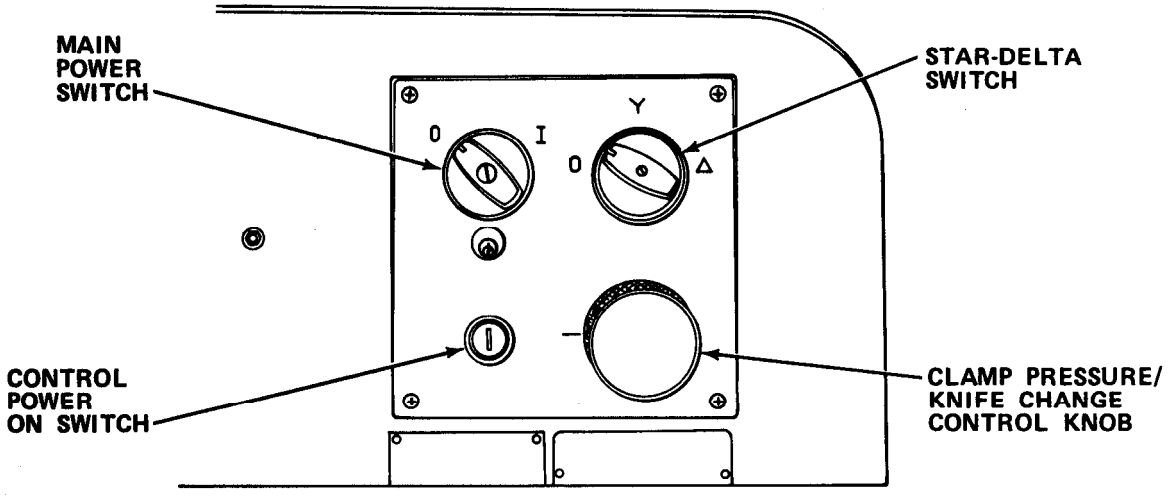
Fuse Designation	Use	Voltage/Amperage
F1	24 V dc and 5.1 V dc Power Supplies	32 V ac/6.3 amp
F2	Power Module Rectifier Board	11.5 V ac/4 amp
F3	OCL Bulb	12.5 V ac/4 amp
F4	Electronics Enclosure	40 V ac/4 amp
F5	OCL Bulb	12.5 V ac/4 amp
F6	Power Module Rectifier Board	15 V at/l amp
F8	Power Module Rectifier Board	20 V at/l amp



(3) Power module rectifier board (PMR). Receives inputs from the PMF board. The inputs are 20 V ac and 15 V ac. These inputs are not currently used with this machine. It also receives inputs from rectifier (PM.V2) on the PMD board. This input of +9 V is stabilized to produce a +9 V output which is used for the LED measurement display (SDA).

(4) Main transformer. Has input taps for adjusting to multiple input voltages. The primary winding has tap connections for 200, 220, 240 and 260 V ac. The taps on the secondary windings provide voltages of 11.5, 12.5, 15, 20, 32, and 40 V ac. The main transformer supplies power to the other components in the system via the PMF board in the power module.

c. Operating switches. Provide operator with control of the system. There are seven operating type switches:

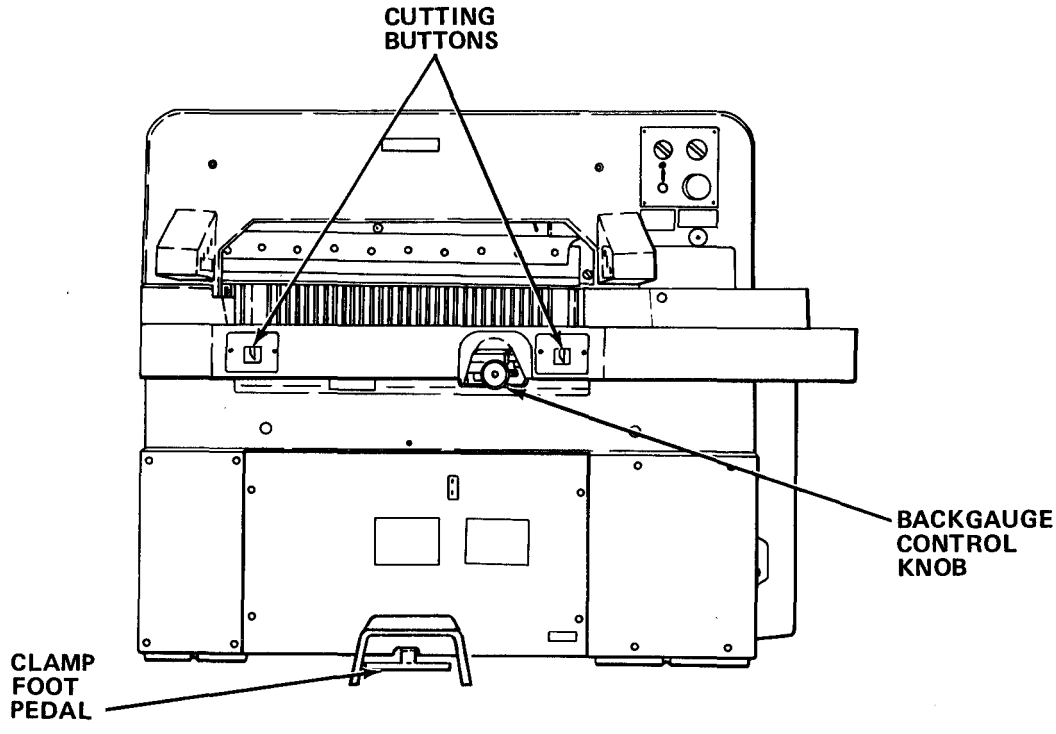


(1) Main power switch. Primary power switch. A two position (I, O) selector switch which applies power to the Star-Delta switch.

(2) Star-Delta switch. A three position selector switch. In "Y" position, applies power to main drive motor's Y windings. After the main drive motor has reached full speed, the switch is then placed in the "Δ" position to apply power to the Δ windings of the motor, and apply power to the power module.

(3) Control power on switch. After the Star-Delta switch has been placed in the "Δ" position, the control power on switch allows power to be applied to the main transformer. This switch controls relay (K304) which is used to apply power to the main transformer.

(4) Clamp pressure/knife change control knob. Used to adjust the pressure of the clamp. When knob is pulled out, it opens the inch valve for knife changing operations, and de-energizes the locking valve to block operation of the clamp with respect to cutting.

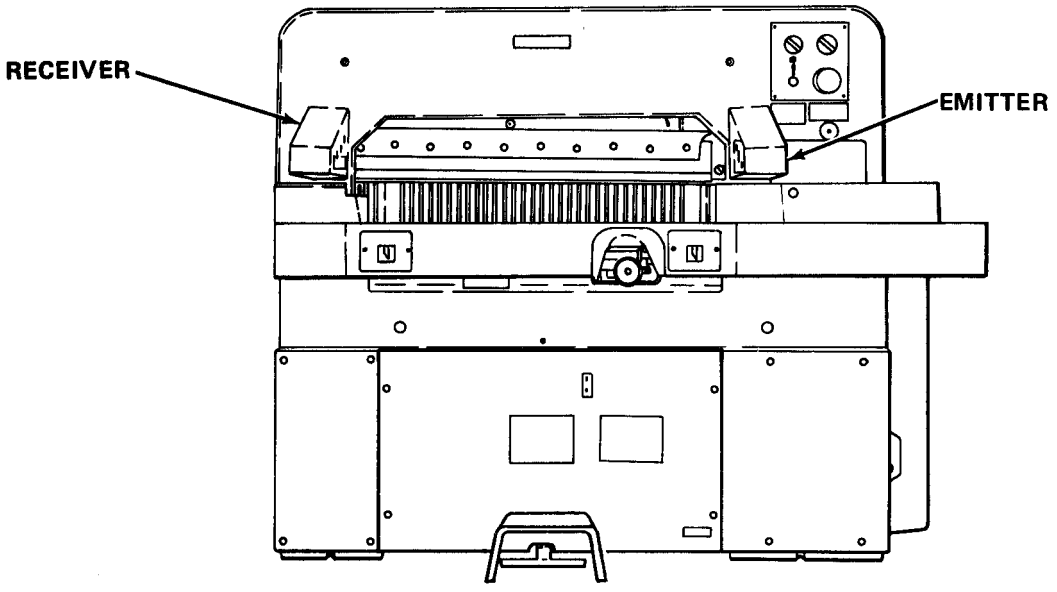


(5) Cutting buttons. Controls the knife via the hydraulic system. Pressing both buttons within 0.5 second applies power to the control unit controlling the operation of solenoids in the hydraulic system control block.

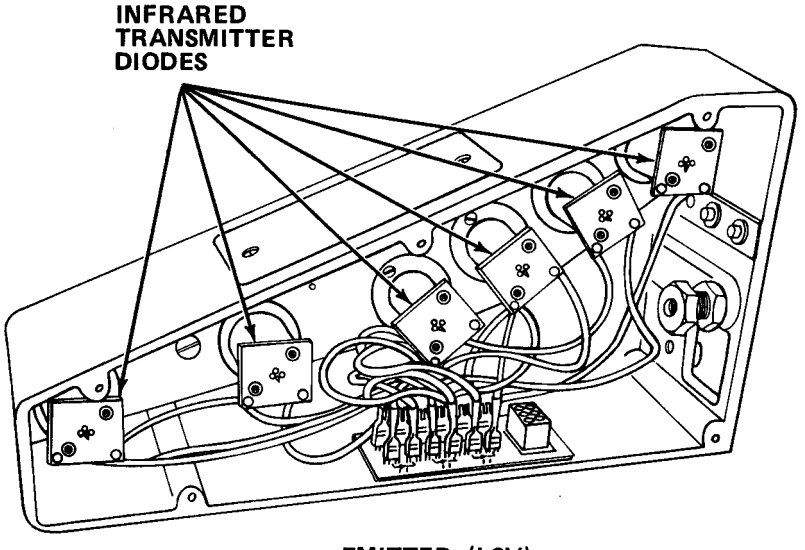
(6) Clamp foot pedal. Controls the operation of the clamp. When pressed, trip dogs mounted on the pedal axle close the clamp pedal switch (S309) and press in the clamp control valve in the hydraulic system control block. This initiates sequences of operation (Table 5-16) in the electronics and hydraulics that control the operation of the clamp when using the foot pedal.

(7) Backgauge control knob. Controls the movement of the backgauge, via a control knob, limit switches, and a button. The control knob is mounted on one end of a metal rod, with a toothed gear on the other end, and a trip dog cam mounted on the middle of the rod. Two switches are mounted next to the trip dog cam. Pushing the control rod in will control the contacts on one switch (S18), and pulling it out will control the contacts of the other switch (S10). Pushing the control knob in activates switch (S18) which disengages the backgauge brake. The toothed gear engages a toothed gear on the table spindle. This allows turning of the knob to finely adjust the position of the backgauge. Pulling the control knob out activates switch (S10) which allows the backgauge motor to turn in a direction that allows the backgauge to move forward. Pushing the button in the middle of the control knob activates switch (S14). Activating this switch allows the backgauge motor to turn in a direction that allows the backgauge to move back.

LIGHT BARRIER

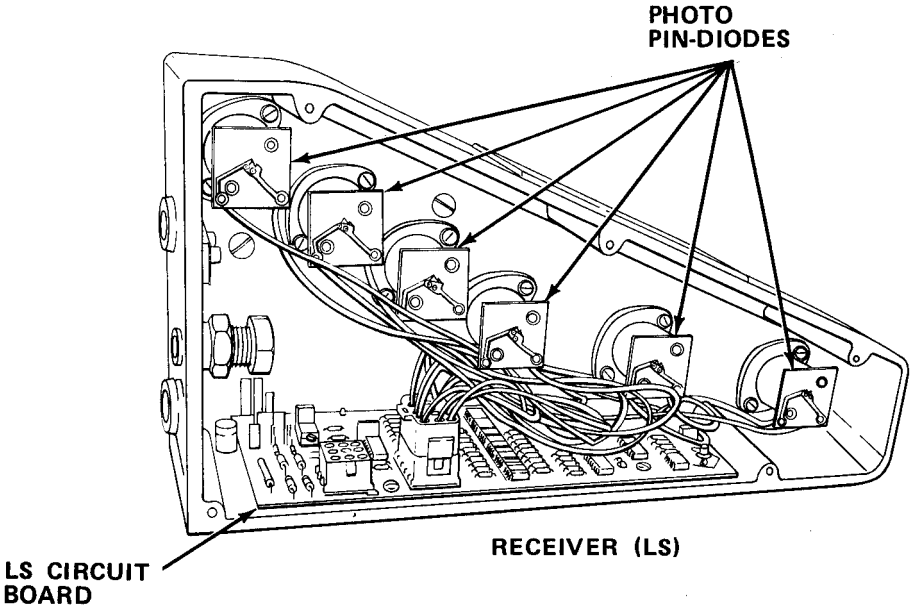


d.Light barrier. Safety system, when activated, directly controls the operation of the knife. The light barrier consists of two halves.



EMITTER (LSV)

(1) Emitter (LSV). Located on the right side. Contains infrared transmitter diodes which emit light pulses at a frequency of 1000 Hz. Three diodes are wired in series with diodes 1, 3, and 5 working against the phase of diodes 2, 4, and 6. Input to the LSV comes from the receiver half (LS).



(2) Receiver (LS). Located on the left side. It consists of photo pin-diodes which receive the infrared light pulses and transform them into electrical signals. The electrical signals are applied to amplifiers and transformed into digital signals. The receiver also has an oscillator which supplies the signals for the emitter half. The receiver has 12 LED indicators which indicate operation of the light barrier. Table 5-11 shows the conditions of the LED's.

LIGHT BARRIER LED'S

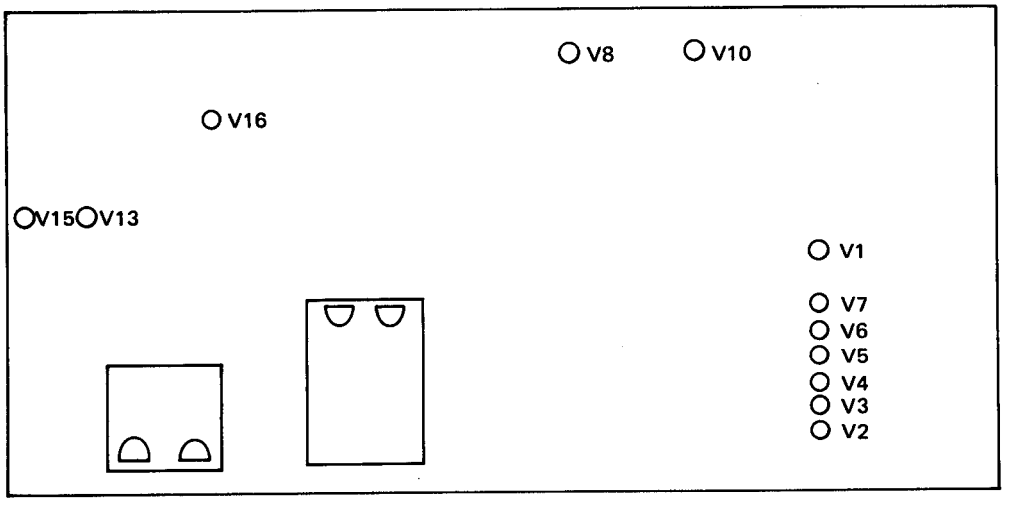
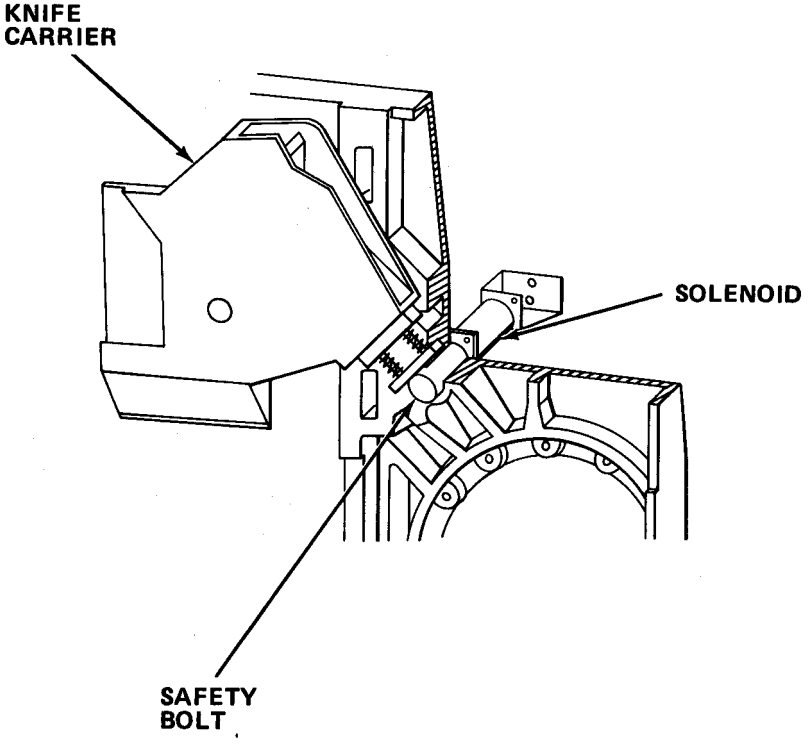


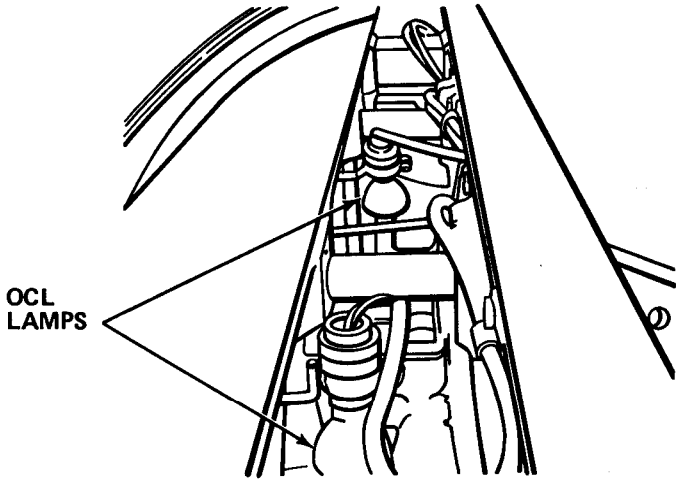
Table 5-11. LIGHT BARRIER LED's

LED	Color	Indication
V1	Red	When lit indicates a malfunction in the oscillator.
V 2 - V 7	Red	Will glow slightly during normal operations. Any failure or interruption of a channel will cause the respective LED to be lit brightly.
V8	Green	When lit, indicates that the light barrier is functioning properly.
V10	Red	When lit, indicates the light barrier is not functioning properly.
V13	Red	When lit, indicates that transmitting diodes 1, 3, and 5 are functioning.
V15	Red	When lit, indicates that transmitting diodes 2, 4, and 6 are functioning.
V16	Green	When lit, indicates that +12 V stabilization network on LS board is operating.

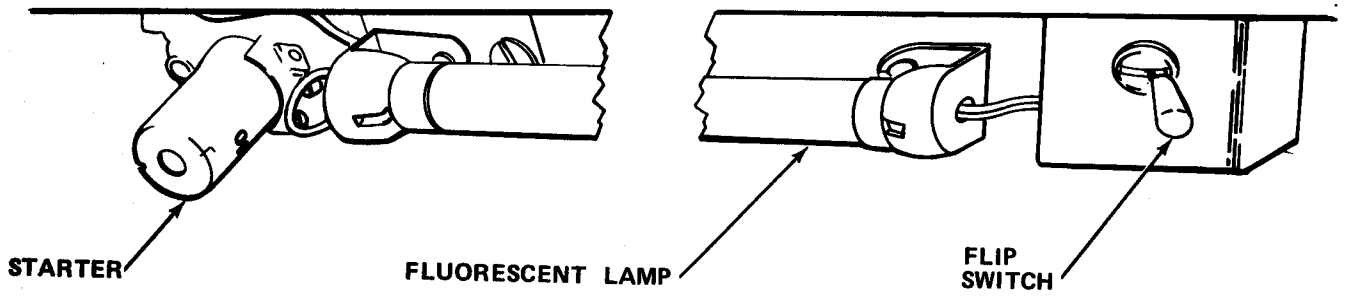


e. Safety bolt assembly. Prevents the knife from making more than one cut at a time. The safety bolt is controlled by a solenoid. When the solenoid is de-energized, a spring forces the safety bolt out of the solenoid. The safety bolt is then in a position which prevents the knife carrier from moving downward. When the solenoid is energized, the safety bolt is retracted, allowing the knife carrier to move downward. The solenoid is controlled by the hardware channel (HK) board in the control unit. When the cutting buttons are depressed, and the knife delay is over, the solenoid is energized, and the safety bolt retracted, allowing the knife carrier to move downward. When the knife carrier reaches the bottom of its stroke, the safety bolt solenoid is de-energized. This forces the safety bolt against the back of the knife carrier. Once the knife carrier reaches the top of its upward stroke, the safety bolt is then clear of the back of the knife carrier and is allowed to extract fully. This keeps the knife from making a second cut. The safety bolt can only be retracted again by releasing the cutting buttons and depressing them. On the back of the safety bolt are two proximity switches (B.SBE and B.SBA). The proximity switches are magnetically activated. When the safety bolt is fully extracted, proximity switch (B.SBE) is closed, and proximity switch (B.SBA) is opened. When the safety bolt is fully retracted, proximity switch (B.SBE) is opened, and proximity switch (B.SBA) is closed.

f. Lighting system. Provides illumination of the work surfaces and controls. There are two illumination devices on the machine.

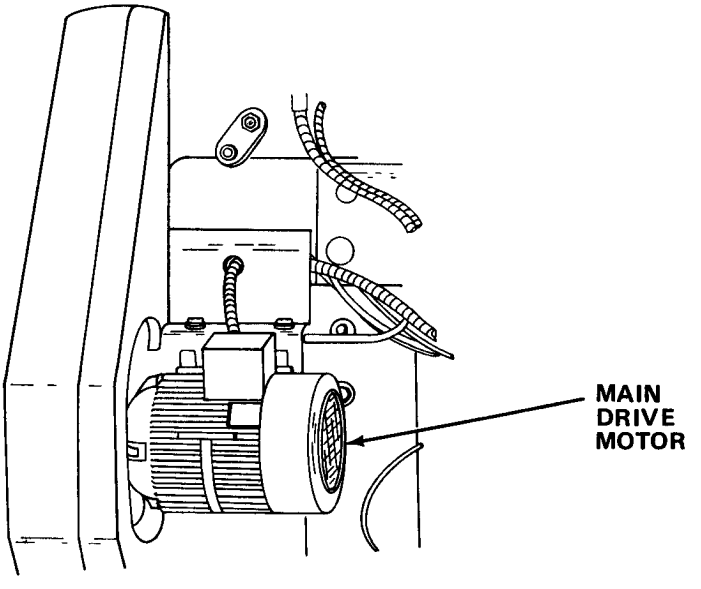


(1) OCL lamps. Two lamps within the top frame of the machine. They shine between the knife carrier and the clamp to produce a thin cutting line on the table bed. The line shows where the knife will cut when it comes down so that material to be cut can be properly positioned. The position of the lamps can be adjusted via two knurled knobs on the back of the frame to produce the best cutting line.

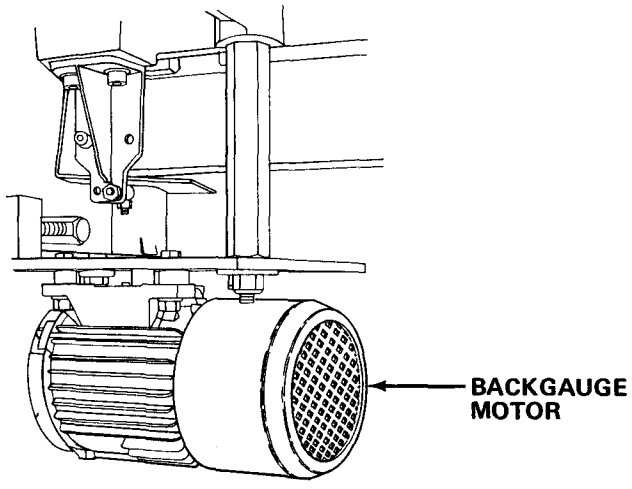


(2) Fluorescent table lamp. Provides general illumination of the table bed work surface. Consists of one fluorescent lamp, a starter, a capacitor, a ballast, and a flip switch which turns the lamp on and off. When the fluorescent lamp is on, the OCL lamps are off. When the fluorescent lamp is off, the OCL lamps are on.

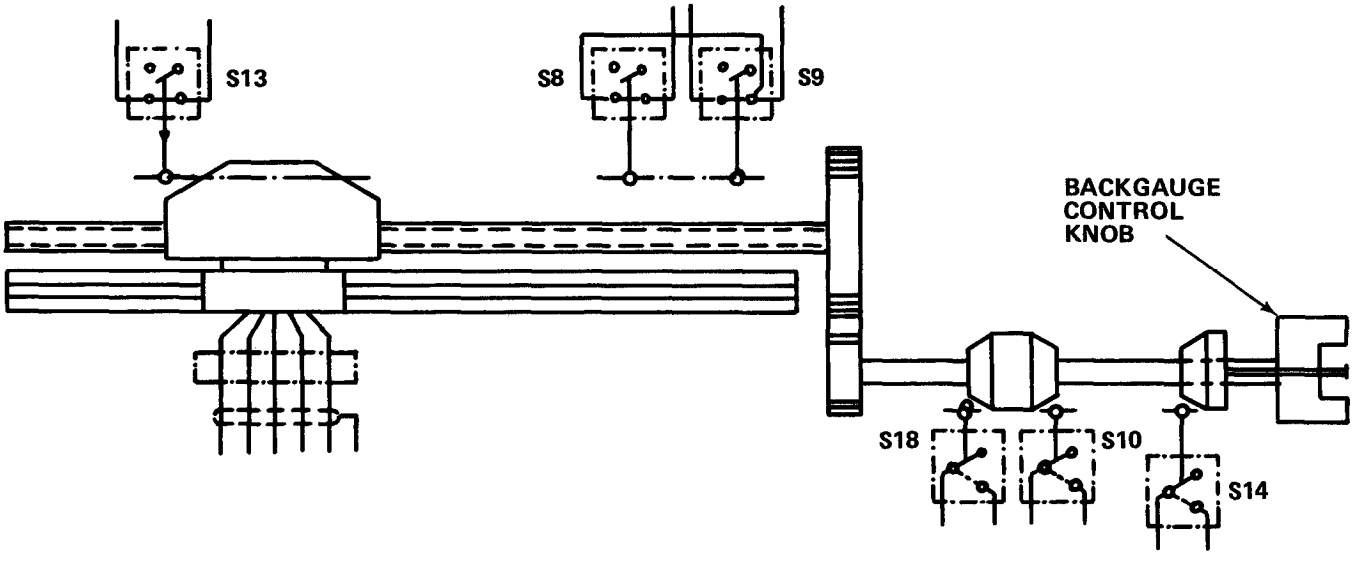
g. Motors. Provide driving power for the hydraulic system and the backgauge. The machine has two motors.



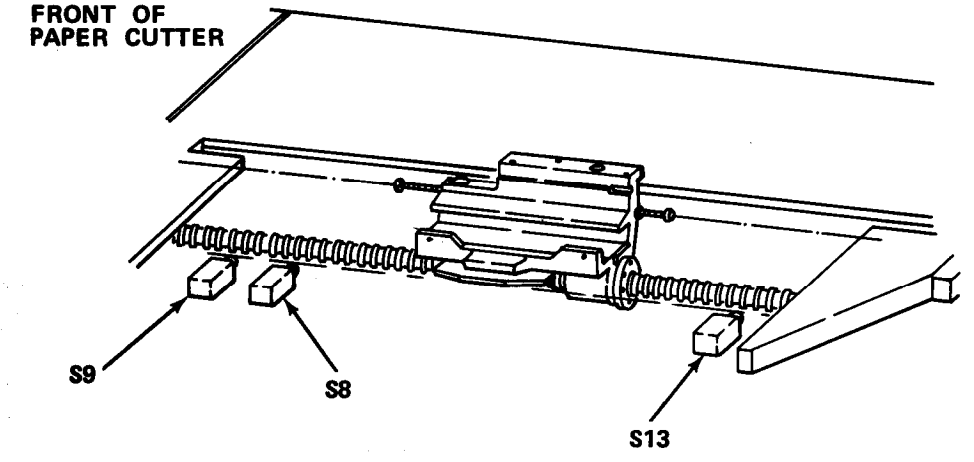
(1) Main drive motor. Provides power to the hydraulic pump and the hydraulic clutch and gear assembly via three pulleys and two V-belts (the clutch and gear assembly drive the knife). It is controlled by the Star-Delta switch on the control panel. (The I/O switch must be in the I position for the Star-Delta switch to operate). The motor will run as long as the Star-Delta switch is in the "Y" or " △ " position. The main drive motor has a high stalling torque, so that when materials have to be cut, the rpm of the motor will drop but the knife will be pulled through the material without fluctuating. An overload relay, located directly below the backgauge control knob, protects the main drive motor from an overload.



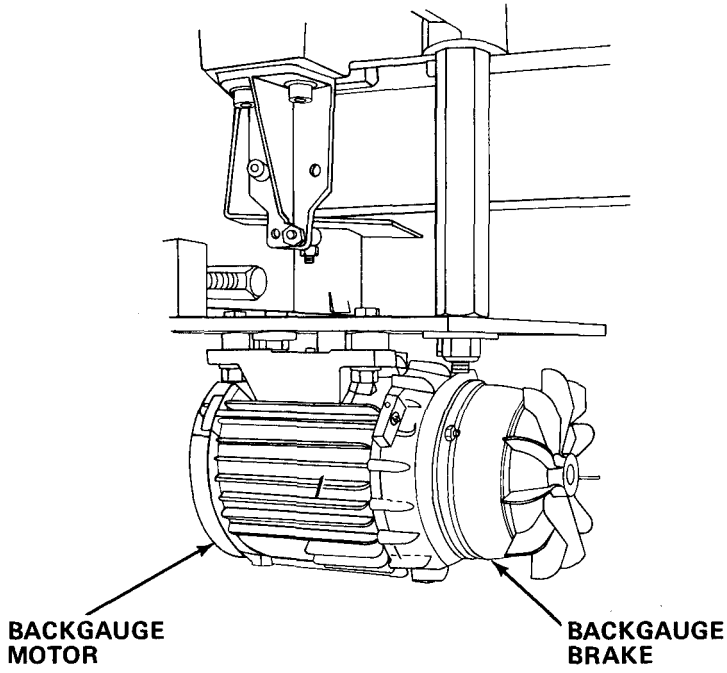
(2) Backgauge motor. Provides power to the backgauge carrier via a pair of pulleys and two V-belts. Operation and the direction of rotation of the motor is controlled by a pair of switches (S10) and (S14). Limit switches are mounted along the backgauge table. The power for the backgauge motor comes from the motor control (MC) circuits. The backgauge motor is protected by an overload relay. The relay is located on the motor control unit (MC), and can be accessed via a door on the electronics enclosure cover.



When the backgauge control knob is pulled out, switch (S10) is closed. This sends +24 V to the positioning computer interface (IAR) circuits. The IAR circuits recognize this as a forward command. This forward command is sent to the positioning computer (AR) and then back through the IAR circuit, then to the motor logic (ML) circuits. The ML circuits then energize electronic relays V1M, V2M, and V3M in the motor control (MC) circuit. Power is then applied to the motor and forward motion is started. When the push button on the backgauge control knob is pressed, switch (S14) is closed. This sends +24 V to the IAR circuits. The IAR circuits recognize this as a backward command. This backward command is sent to positioning computer (AR) and then back through the IAR circuit, then to the ML circuits. The ML circuits again energize electronic relays V1M, V2M, and V3M, along with relay K15M. This relay reverses the wires on the motor which allows the motor to rotate in the reverse direction. The backgauge now starts to move back.

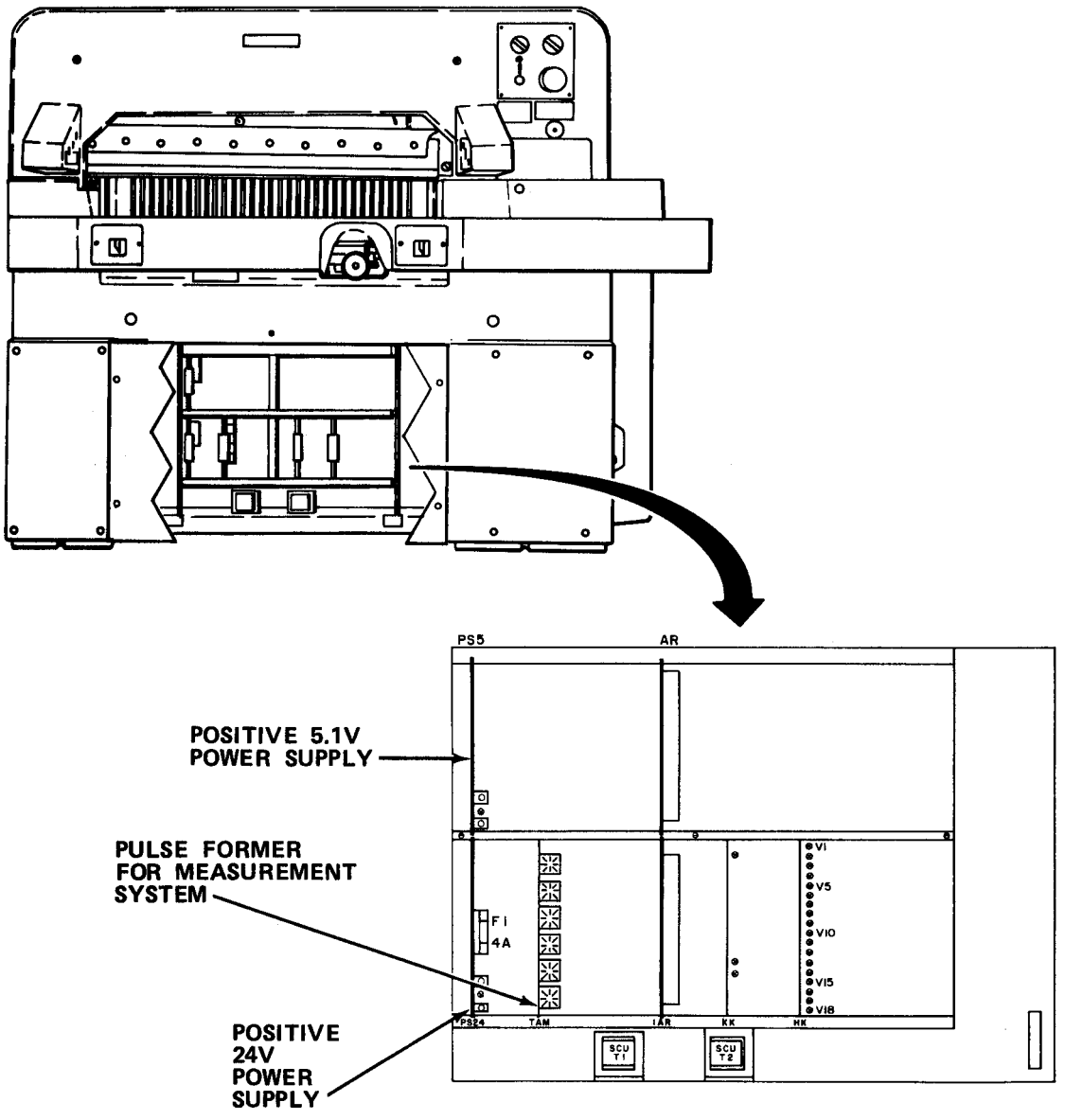


Limit switches mounted along the table bed where the backgauge runs limit the distance the backgauge can travel in either direction. The switches are activated by a pair of nylon trip dogs that ride on the backgauge sledge. Limit switch (S13) limits the backward travel of the backgauge. When the backgauge is traveling backward and reaches the most backward position allowed, it causes the trip dog to trip, (open), and switch (S13) will cut off power to the motor. When the backgauge is moving forward, two limit switches are used. Switch (S9) is used when the false clamp is not installed. This allows the backgauge maximum forward travel toward the cutting line. Switch (S8) is used whenever a false clamp is installed. Switch (S6) indicates that a false clamp is installed. When a false clamp is installed, switch (S6) is actuated, allowing limit switch (S8) to cut power to the motor when activated. Limit switch (S8) will stop the backgauge at a shorter distance than normal to provide the extra space needed because of the false clamp. These limit switches are inputted directly to the ML circuits.



h. Backgauge brake. Provides an almost instant stopping (within 1/100th of a second) of the backgauge movement. The backgauge brake is mounted on the back of the backgauge motor. Solenoid (Y17) is used to control the backgauge brake. When the backgauge motor is energized, the solenoid is energized to remove the brake. When the backgauge motor is de-energized, the solenoid is de-energized, and the brake released, which stops the rotation of the motor almost instantly. During manual operations, (when the backgauge control knob is pressed inward), switch (S18) is activated which allows the solenoid to energize allowing manual operation.

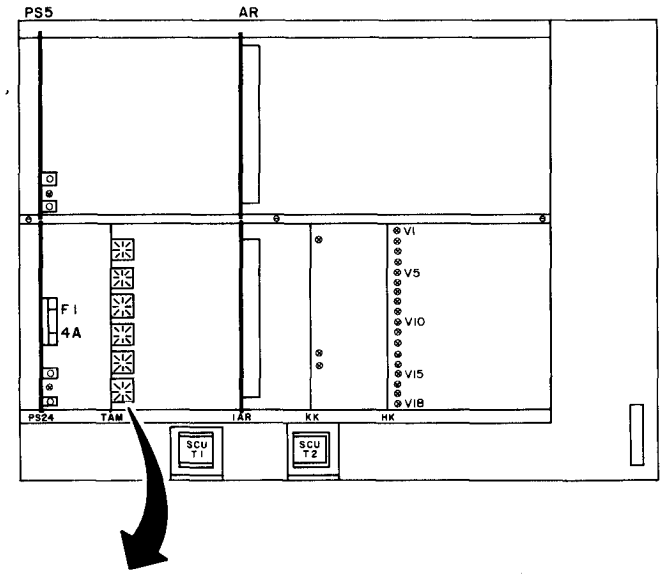
i. Control unit (SCU). Located in the bottom front of the machine, just left of center. Contains seven circuit boards which are used in the control and operation of the machine. It is comprised of:

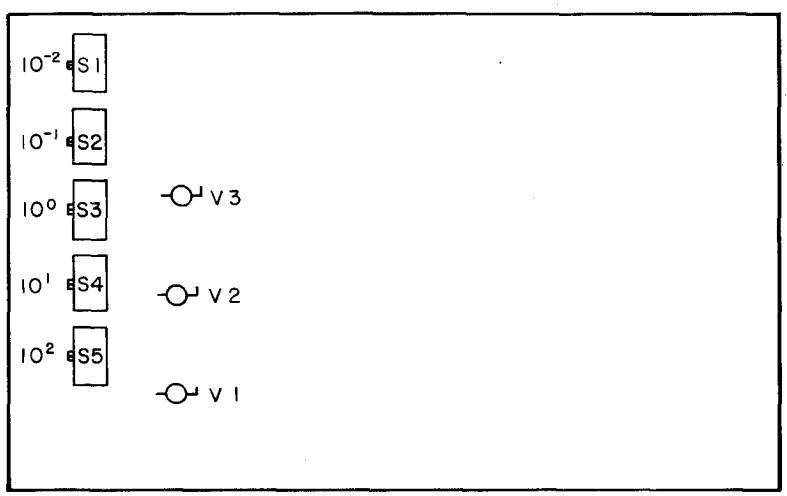


(1) Positive 5.1 V power supply (PS5). Receives +32 V input from the power module. Converts the +32 V input to a stabilized +5.1 V used for control logic on other circuit boards in the machine. PS5 contains a voltage sensor that will, after turning off the machine, initiate a reset to the hardware channel and positioning computer circuits. A green LED on the board, when lit, indicates normal operation. Voltage output can be measured between the blue and red test receptacles. A potentiometer on the board allows for adjustments.

(2) Positive 24 V power supply (PS24). Receives the same +32 V from the power module as PS5. Converts the +32 V input to a stabilized +24 V used for control devices, (i.e., solenoids and relays) and cutting circuits. A green LED on the board, when lit, indicates normal operation. Voltage output can be measured between the blue and red test receptacles. A potentiometer on the board allows for adjustments. PS24 also has a fuse (located on the board) to protect its output.

(3) Pulse former for measurement system (TAM). This circuit receives forward and backward pulses from the scanning device on the linear scale. These pulses are applied to a six-stage up-down counter (of which only five are used by this machine) counting up for backward movement, and down for forward movement. A reference signal from linear scale is sent to the TAM circuit whenever the scanning device passes over a preset reference point on the linear scale. This is used to ensure that the adjustment dials information has been inserted into the counter and an accurate measurement of the distance is displayed. Five miniature rotary type switches are located on the front of the board. These are used for adjusting the display. The switches have ten positions, 0 - 9. Three LED lights are also located on the board. These indicate the following:

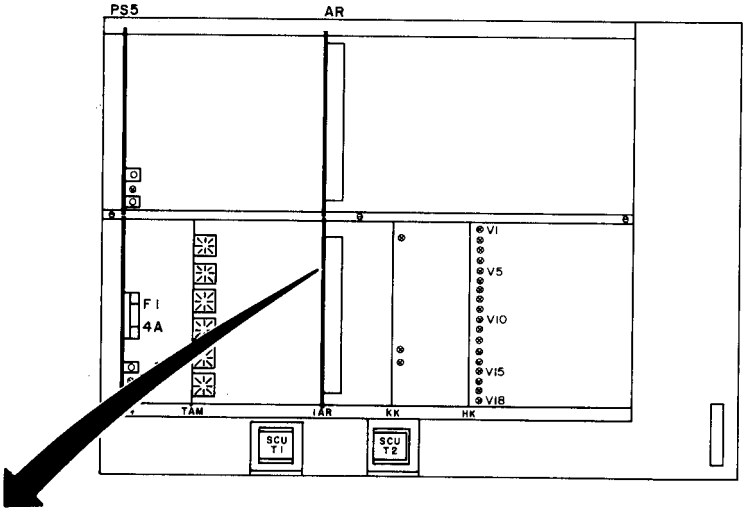




V1 Lit during each backgage movement
V2 Lit only during forward movement
V3 Lit only during the passing of the reference point.

(4) Positioning computer (AR). Receives the backgauge position information from the TAM circuits, and passes it along to the positioning computer interface circuits (IAR). It also contains the logic circuits used during cutting operations, and backgauge movement operations.

(5) Positioning computer interface (IAR). The IAR board is used to interface all the operating switches to the AR circuits. It converts the voltage levels from the switches to the proper voltage level used in the AR circuits. It also is used to interface positioning information from the AR circuits to the LED measurement display. Additionally, the IAR board interfaces the light barrier circuits to the AR circuits, the AR circuits to the monitor channel (KK) circuits, and the hardware channel (HK) circuits. As described previously, the IAR circuits also interface the backgauge control signals to the motor logic (ML) circuits. The IAR board has an amplifier on it for control of the locking valve (M1) in the clamping operation. Two switches on the IAR board are used to change the LED measurement display from inches to metric (S2) and to move the decimal point when in the metric mode from mm to cm (S1). Inputs and outputs of the IAR board can be checked by 14 LED indicators on the board. Table 5-12 shows the indication indicated by a lit LED.



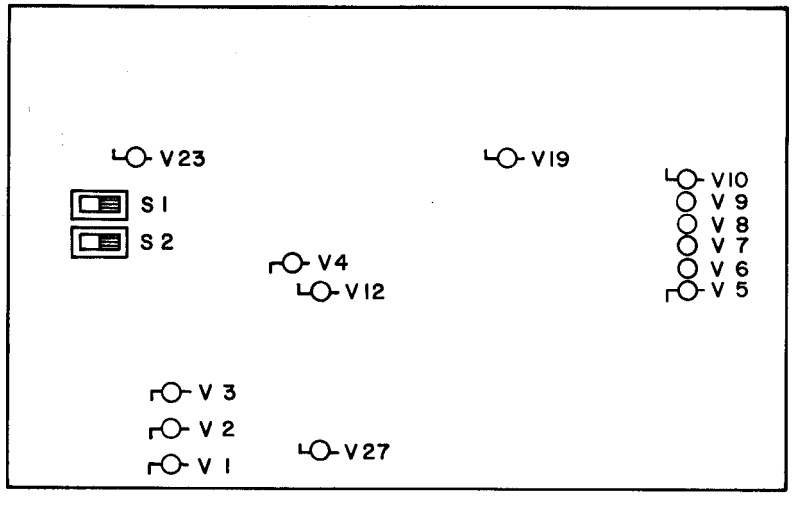


Table 5-12. IAR BOARD LEDs

LED	Color	Lit Indication
V1	Red	Cutting buttons actuated within 0.5 seconds
V2	Red	Light barrier test positive
V3	Red	Safety bolt solenoid not energized.
V4	Yellow	Knife carrier upper position
V5	Yellow	Clamp up
V6	Yellow	Clamp foot pedal depressed
V7	Yellow	Forward backgauge movement
V8	Yellow	Reverse backgauge movement
V9	Yellow	Manual backgauge operation
V10	Yellow	(Not Used)
V12	Red	Locking valve (M1) energized
V19	Red	Clamping valve (M2) energized
V23	Red	Clutch valve (M3) energized
V27	Red	(Not Used)

(6) Hardware channel (HK). Performs the logic operations for the cutting cycle. Performs identical logic operations as done by AR circuits. The circuit has a +12 V stabilizer circuit which uses a +24 V supply. The HK board also has an electronic stage for the control of the safety bolt. Inputs and outputs of the HK board can be checked by 18 LED indicators on the board. Table 5-13 shows the indication indicated by a lit LED.

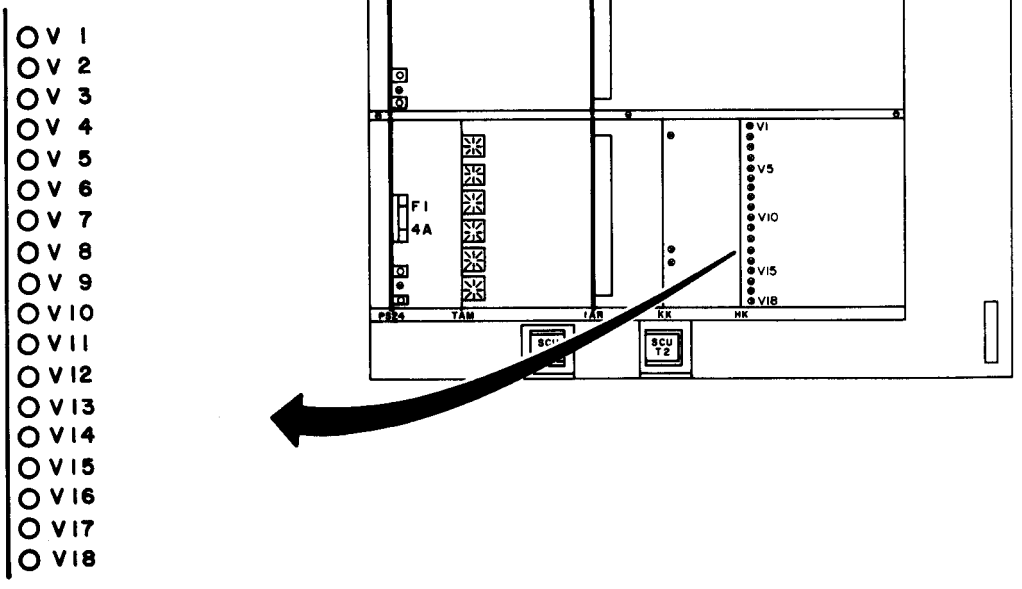
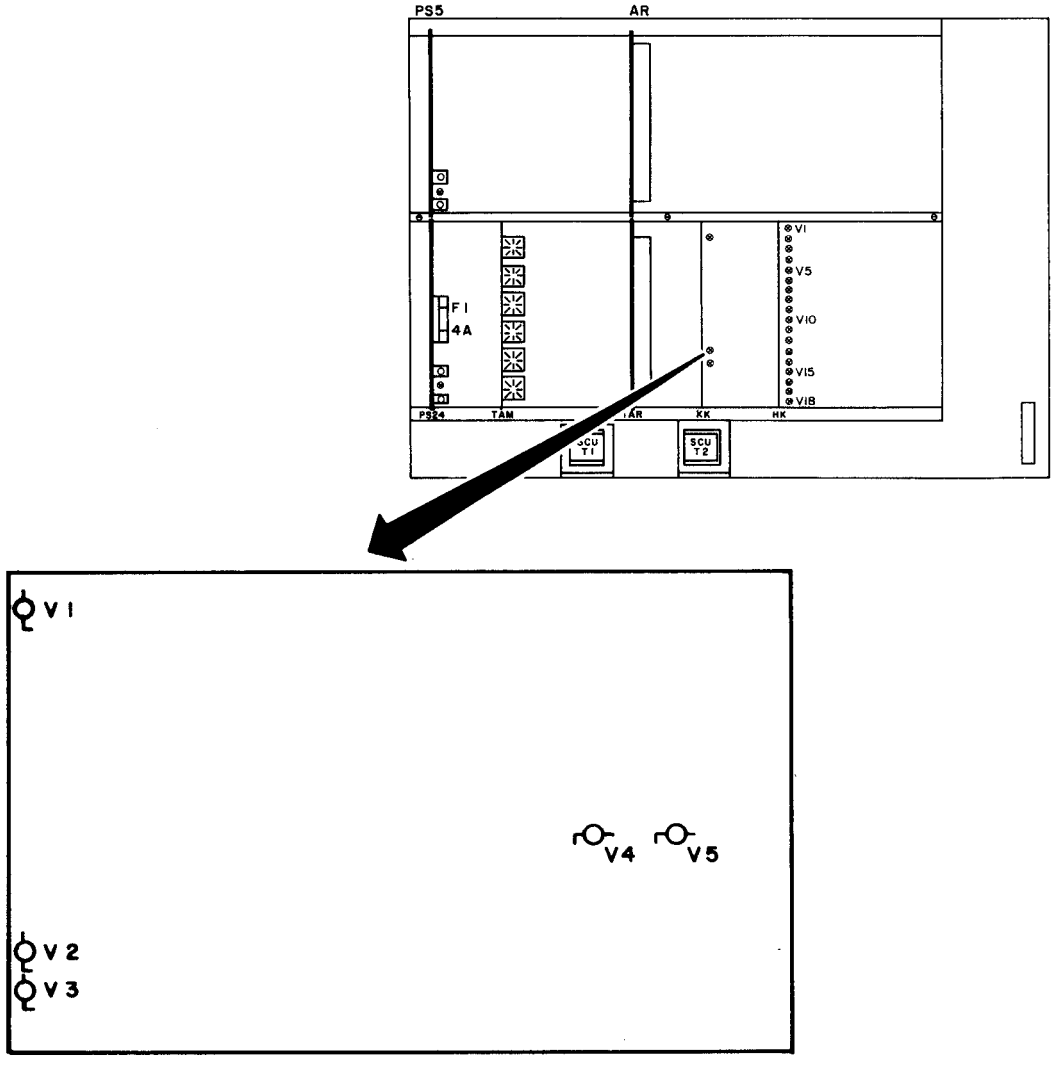


Table 5-13. HK BOARD LEDs

LED	Color	Lit Indication
V1	Green	+12 V on
V2	Yellow	Knife delay over
V3	Yellow	Backgauge motor stopped
V4	Yellow	Safety bolt fully extracted
V5	Yellow	Safety bolt fully retracted
V6	Yellow	Left cutting button not depressed
V7	Yellow	Right cutting button not depressed
V8	Yellow	Left cutting button depressed
V9	Yellow	Right cutting button depressed
V10	Yellow	(Not Used)
V11	Yellow	Knife carrier in lowest position
V12	Yellow	Light barrier okay

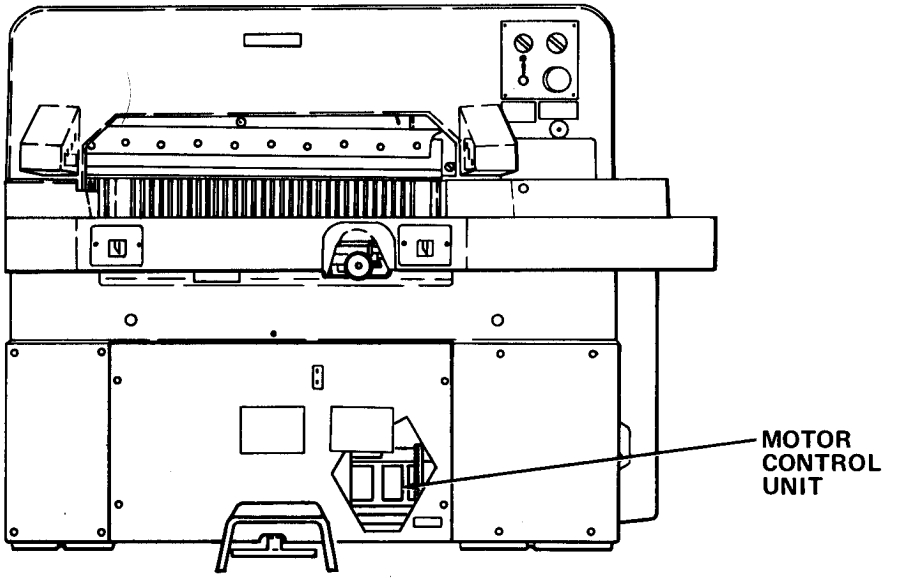
Table 5-13. HK BOARD LEDs - Cont

LED	Color	Lit Indication
V13	Yellow	Knife change knob pulled
V14	Red	Both cutting buttons depressed within 0.5 seconds
V15	Red	Clutch valve (M3) energized
V16	Red	Safety bolt solenoid energized
V17	Red	Clamping valve (M2) energized
V18	Red	Light barrier test positive



(7) Monitor channel (KK). Is used to compare the output signals from the positioning computer (AR) and the hardware channel (HK). If the signals compare, the KK board will supply voltage to the clamping and cutting valves. This will then start the cutting operation. Two transformers are used with the KK board. These transformers are mounted on the motherboard of the control unit and are used in supplying voltage to the clamping and cutting valves. Five LEDs are located on this board. When lit they indicate the following:

V1	+12 V is applied to the board
V2 & V3	The outputs of the HK board and the AR board are different
V4	Clamping valve (M2) energized
V5	Clutch valve (M3) energized.



j. Motor control (MC) unit. Located just to the right of the control unit. The MC unit is used to control the backgauge motor. Three solid state relays (V1M, V2M, and V3M) control the 3-phase ac for the backgauge motor. Relay (K15M) located on the MC unit is used to select the direction of the motor's rotation. When relay K15M is de-energized, the backgauge motor runs forward. When energized, the motor runs in reverse. Another relay (K11M) located on the MC unit is always energized and is not used by this machine. A plug-in board, motor logic (ML) is also mounted in the MC unit. The ML board receives inputs from the IAR board. The ML board then controls the relays on the MC unit and the backgauge brake solenoid. The ML board has eight LEDs which indicate the operation and condition of the backgauge. Table 5-14 lists the lit indication of each LED. An overload relay for the backgauge motor is also located on the MC unit.

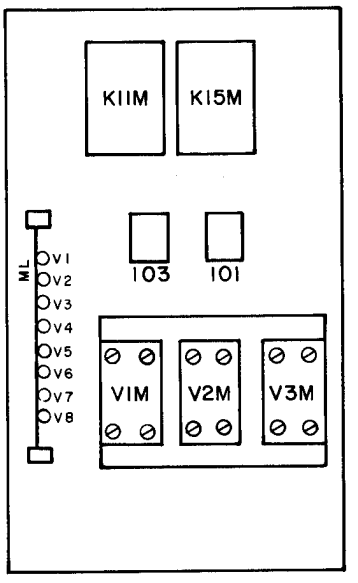


Table 5-14. ML BOARD LEDs

LED	Color	Lit Indication
V1	Red	Normally off, indicating relay K11M is energized.
V2	Red	Backgauge in forward mode
V3	Yellow	(Not Used)
V4	Yellow	False clamp installed
V5	Red	Backgauge brake off
V6	Yellow	Backgauge not at front limit switch
V7	Yellow	Backgauge not at back limit switch
V8	Red	Backgauge motor on

k. Measurement display (SDA). Located on the top front of the machine behind the top front cover plate. Receives +9 V from the power module rectifier circuits (PMR), and logic signals from the IAR board. The inputs from the IAR circuits are used to light six numeric LED displays. Table 5-15 shows indications and meanings of each display. The board has one green LED indicator which, when lit, indicates that the +9 V is being received from the PMR circuits. The LED-display also shows error messages when a malfunction is present.

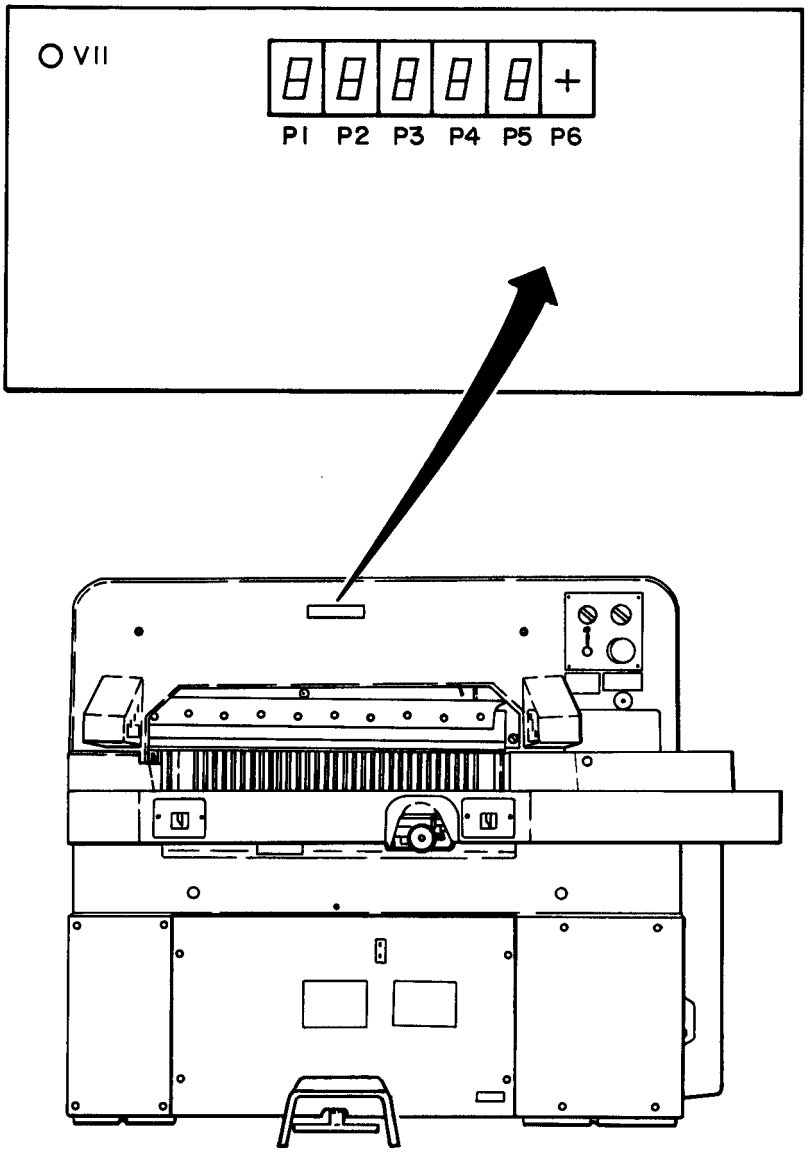
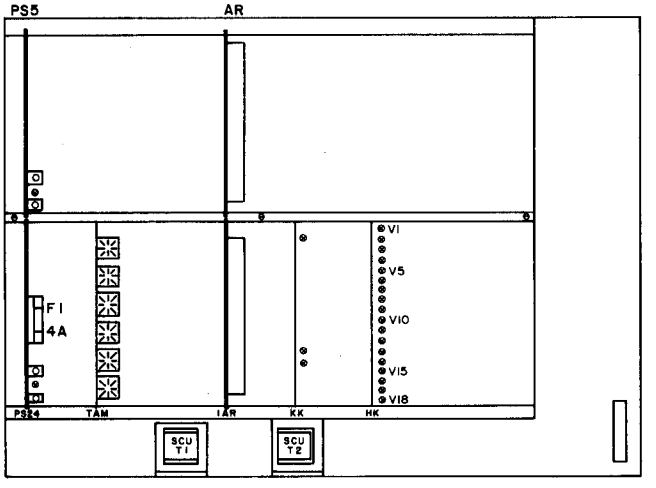


Table 5-15. MEASUREMENT DISPLAY NUMERIC LEDs

LED	Meaning
P1	Not Used
P2	Tens position
P3	Ones position
P4	Tenths position
P5	Hundredths position
P6	“+” the backgauge is moving to the rear
	"-" the backgauge is moving forward
V11	+9 V applied

Table 5-16. SYSTEM OPERATION SEQUENCES

Sequence Step	Basic Operation Circuit/Component Operation



NOTE

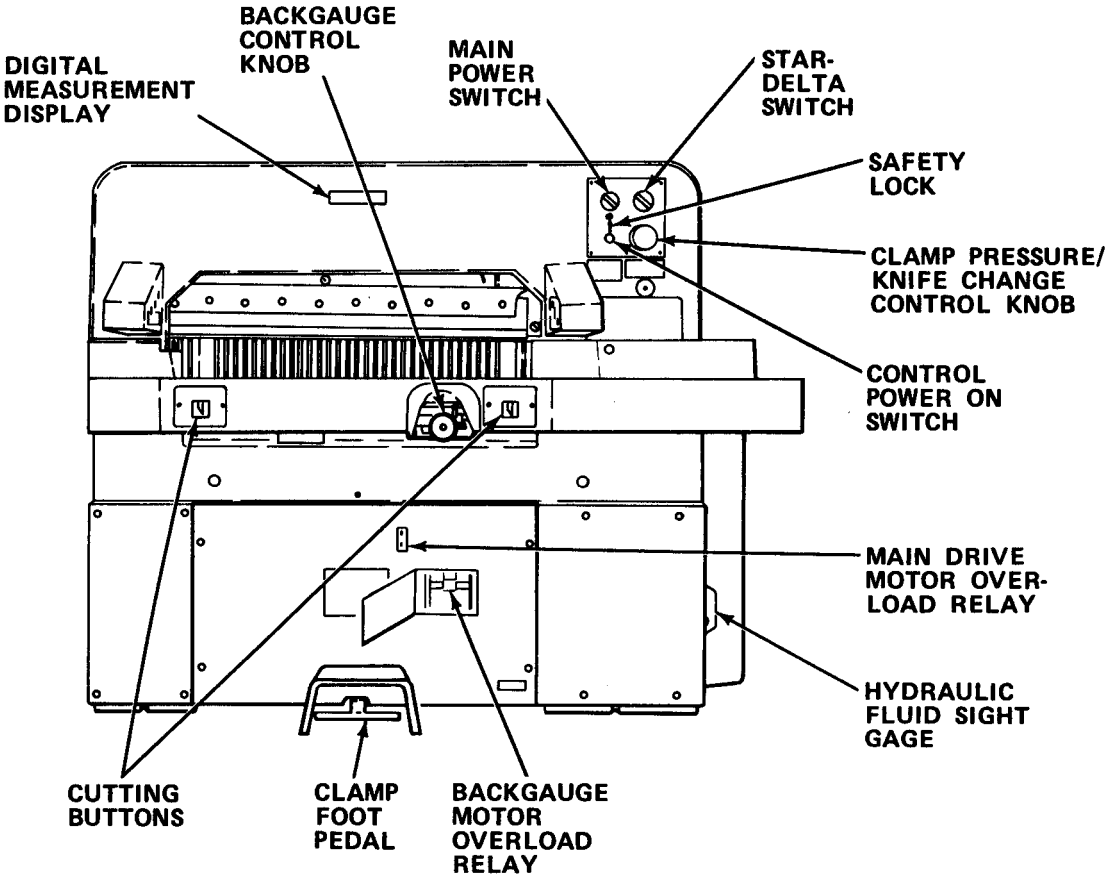
All LED indications are in reference to the LEDs on the hardware channel (HK) board unless otherwise stated.

1	Cut permission from positioning computer (AR). Backgauge stopped. LED V3 on.
2	Press both cutting buttons within 0.5 seconds. LED V6 and V7 off, LED V8 and V9 on. LED V14 on. Clamp locking valve (M1) energized, clamp lowers.
3	Light barrier test demanded by positioning computer (AR). (LEDs on left light barrier housing: V8 shortly off while V10 shortly on) If light barrier test positive LED V18 on.
4	Energize clamping valve (M2) LED V17 on.

Table 5-16. SYSTEM OPERATION SEQUENCES - Cont

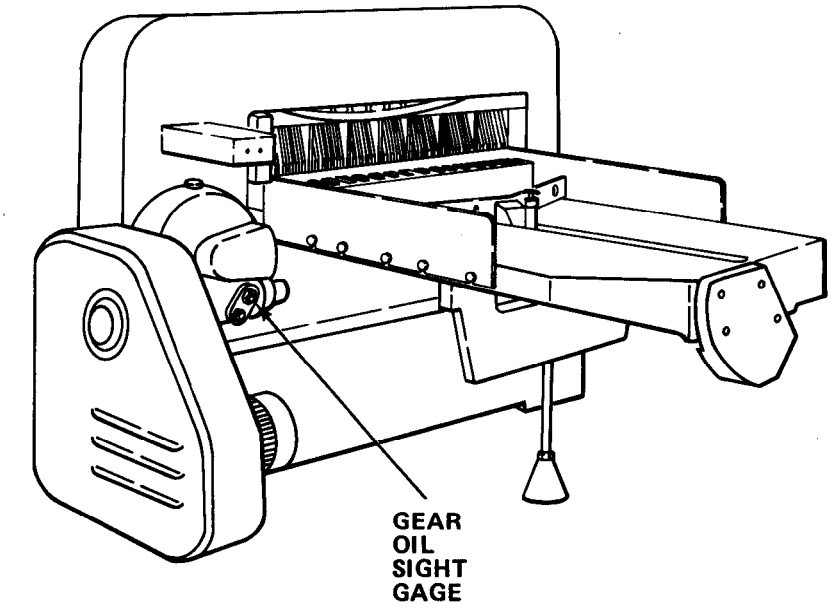
Sequence Step	Basic Operation Circuit/Component Operation
	-Knife delay time-
5	Signal knife delay over from positioning computer (AR) LED V2 on.
6	Energize safety bolt. LED V16
7	Safety bolt proximity switch (B.SBE) opens, LED V4 off, and proximity switch (B.SBA) closes, LED V5 on.
8	Energize cutting valve (M3), LED V15 on.
	-Knife descending-
9	Knife reaches lowest position, activating gear limit switch (S22a), LED V11 on.
10	Safety bolt de-energized, LED V16 off.
11	Clamping valve (M2) de-energized, LED V17 off. Locking valve (M1) de-energized, clamp locked.
	-Knife rising-
12	Knife reaches uppermost position, activating gear limit switch (S22a) LED V11 off. Locking valve (M1) energized, clamp rises.
13	Safety bolt proximity switch (B.SBE) closes, LED V4 on, and proximity switch (B.SBA) opens, LED V5 on.
14	Cutting valve (M3) de-energized, LED V15 off.
15	Reset the stored signal "light barrier test positive", LED V18 off.
16	Cutting buttons released, LED V14 off, LED V6 and V7 on, and V7 on, and LED V8 and V9 off.

5-24. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.



Control or Indicator	Function
Digital Measurement Display	Indicates the actual distance from the backgauge to the knife. Also displays error messages.
Backgauge Control Knob	Controls the movement of the backgauge. FORWARD: Pull the knob out. BACKWARD: Push the button in. HAND FINE ADJUSTMENT: Push the knob in and rotate.

Control or Indicator	Function
Main Power Switch	Controls main power supply to paper cutter.
Safety Lock	Prevents unauthorized use of paper cutter.
Clamp Pressure/Knife Change Control Knob	Controls the force applied by the clamp. When pulled out allows the knife carrier to be inched down to any position during knife change procedures.
Control Power On Switch	Activates main power supply to activate the electronic controls.
Star-Delta Switch	Supplies main power to the main drive motor.
Main Drive Motor Overload Relay	Protects the main drive motor from circuit overloads. To reset, press the green button.
Clamp Foot Pedal	Controls low pressure operation of the clamp.
Cutting Buttons	By simultaneously pressing both buttons, the knife cutting circuits are activated.
Hydraulic Fluid Sight Gage	Used to check the hydraulic fluid level.
Backgauge Motor Overload Relay	Protects the backgauge motor from circuit overloads. To reset, press the I button.

Control or Indicator	Function
	
Gear Oil Sight Gage	Used to check level of gear oil in main drive gear assembly.

5-25. 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.

5-25.1 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.

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

Item	Quantity
Knife Carrying Handles	2 ea
T-Handle Key	1 ea
Cheesecloth (Item 6, Appendix E)	ar
Lens Tissue (Item 13, Appendix E)	ar
Solvent, P-D-680 (Item No. 26, Appendix E)	ar
Paper	ar
Lens Cleaner (Item No. 5, Appendix E)	ar
Vacuum Cleaner	1 ea
Wax (Item No. 30, Appendix E)	ar
Impermeable Gloves	1 pr
Faceshield, Industrial	1 ea

Table 5-17. 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.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER	
1	B	Inspect Paper Cutter.	
		1. Inspect knife for knicked, blunt or damaged cutting edge.	Knife is damaged.
		2. Check for loose nuts, bolts, and screws on knife assembly. Tighten if loose.	
		3. Turn on power and check OCL lamps.	
		a. Unlock safety lock with operator key.	
		b. Turn main power switch to I position.	
		c. Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.	
		d. Press control power on switch.	
		e. Place table lamp switch to the right and check optical cutting line for correct operation.	OCL does not illuminate.
		4. Place table lamp switch to the left and check table lamp for correct operation.	Light operates incorrectly.
		5. Check cutting stick for damage or excessively deep grooves. Rotate or replace if worn or damaged.	

Table 5-17. 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:
		PAPER CUTTER - Cont	
1	B	Inspect Paper Cutter - Cont	
		6. Check false clamp for proper insertion in either its holder under front of table or installed in clamp.	False clamp is not properly inserted.
		7. Turn off paper cutter.	
		a. Turn Star-Delta switch to Y position, then to O position.	
		b. Turn main power switch to O position.	
		c. Lock safety lock with operator key.	
2	B	Clean Paper Cutter.	
		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)	
		1. Clean work surface with solvent-soaked cheesecloth and coat with wax.	
		2. Clean light barrier emitter and collector lenses with lens tissue and cleaner.	

Table 5-17. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

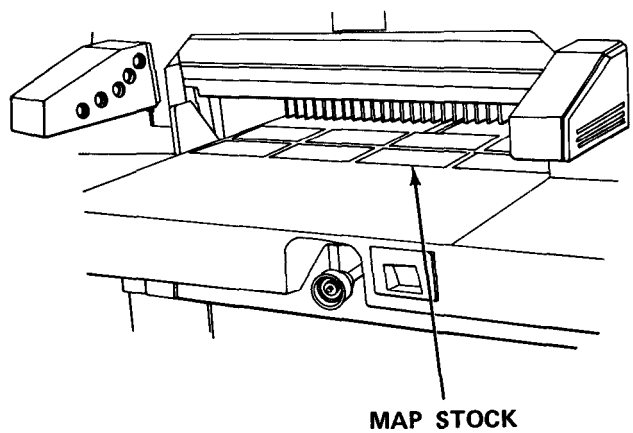
B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
Bl - Biennially

(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
3	B	Check Knife Cut and Cutting Stick.	



1. Lay one sheet of map stock across the cutting line.
2. Turn on power.
   a. Unlock safety lock with operator key.
   b. Turn main power switch to I position.
   c. Turn Star-Delta switch to Y position, after main drive motor is at full speed, turn switch to △ position.
   d. Press control power on switch.
3. Move backgauge forward or backward as necessary until backgauge position is displayed on measurement display.

Table 5-17 OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

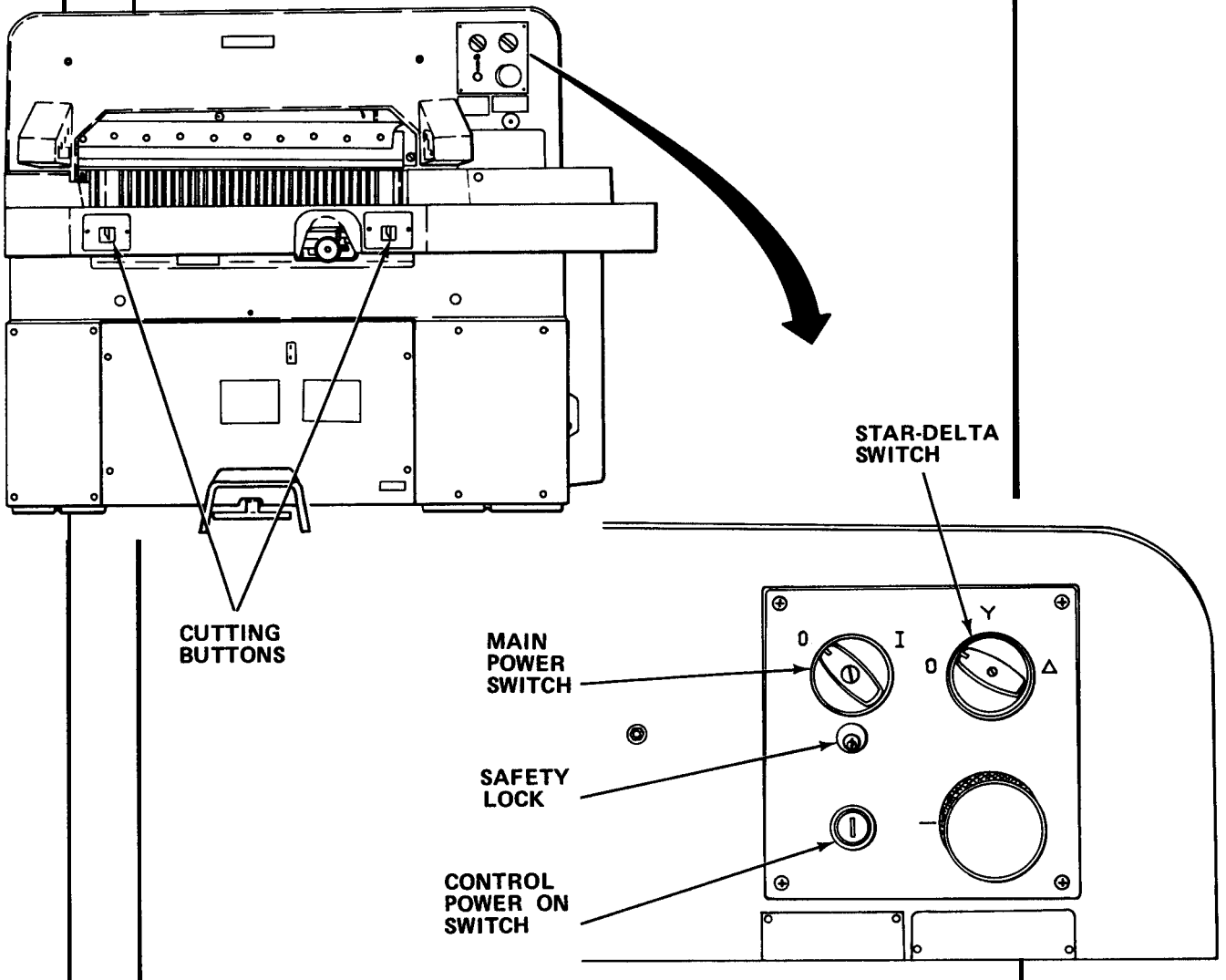
(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
3	B	Check Knife Cut and Cutting Stick - Cont	
		WARNING Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.	
		4. Press both cutting buttons and perform a cut.	
		5. Check each sheet for complete, even cut. If one or more sheets are not cut completely through, check cutting stick, and rotate if necessary.	
		6. Make another cut, and if one or more sheets are still not cut through, adjust the knife.	
		7. Lay several new sheets of paper across cutting line and perform another cut.	Sheets are not cut completely through.
		8. Turn off power. a. Turn Star-Delta switch to Y position, then to O position. b. Turn main power switch to O position. c. Lock the safety lock with the operator key.	

Table 5-17. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED / PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
4	B	Inspect Cutting Buttons.	



1. Turn on power.

   a. Unlock the safety lock with the operator key.

Table 5-17. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
4	B	Inspect Cutting Buttons - Cont	
		b. Turn main power switch to I position.	
		c. Turn Star-Delta switch to Y position. After main drive motor is at full speed, turn switch to△ position.	
		d. Press control power on switch.	
		2. Move backgauge forward or backward as necessary until backgauge position is displayed on measurement display.	
		WARNING Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.	
		3. Press cutting buttons separately, then together.	One cutting button activates cut.
		NOTE Only one cut should be performed if buttons are pressed continually.	
		4. Press both cutting buttons and hold.	Multiple cuts are performed without releasing cutting buttons.

Table 5-17. 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:
		PAPER CUTTER - Cont	
4	B	Inspect Cutting Buttons - Cont	
		NOTE Knife must stop at upper deadpoint and cutting buttons must be released before another cut can be performed.	
		5. Release both cutting buttons and press again.	Knife does not stop at upper dead-point.
		6. Turn off power.	
		a. Turn Star-Delta switch to Y position, then to O position.	
		b. Turn main power switch to O position.	
		c. Lock the safety lock with the operator key.	

Table 5-17. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
Bl - Biennially

(Number) - Hundreds of Hours

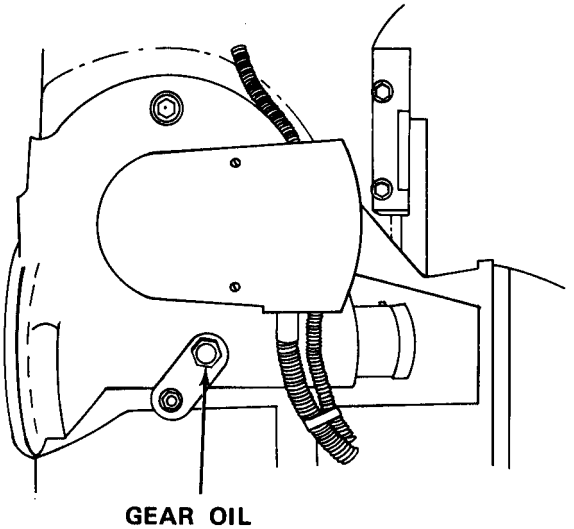
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
5	B	Check Drive Gear Oil Level.	
		 GEAR OIL SIGHT GAGE	
		1. Check gear oil sight gage on rear of drive gear housing. Fluid should be visible in gage.	Gear oil not visible in sight gage.
6	B	Check Light Barrier.	
		1. Turn on power.	
		a. Unlock safety lock with operator key.	
		b. Turn main power switch to I position.	
		c. Turn Star-Delta switch to Y position. After main drive motor is at full speed, turn switch to △ position.	
		d. Press control power on switch.	

Table 5-17. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

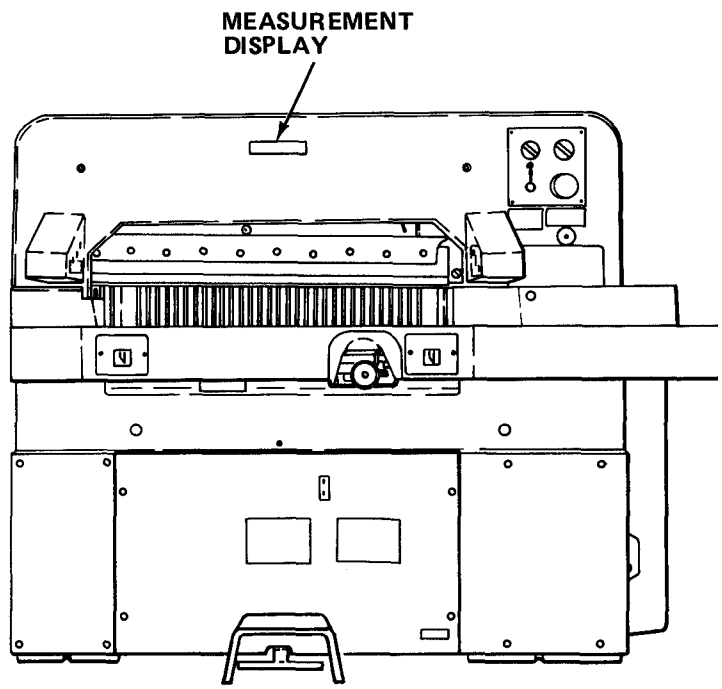
B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
Bl - Biennially

(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
6	B	Check Light Barrier - Cont	



2. Move backgauge forward or backward as necessary until backgauge position is displayed on measurement display.

3. Check that the green LED is lit on the left housing.

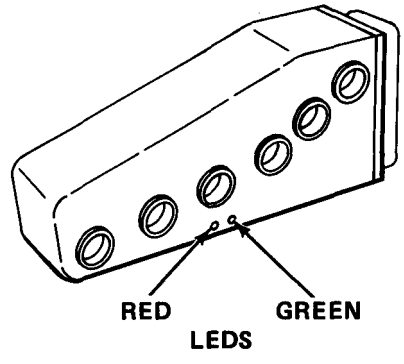
4. Cover each emitter diode individually and make sure green LED goes off and the red LED comes on.

Green LED does not go off and/or red LED does not come on.

Table 5-17. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
6	B	Check Light Barrier - Cont	



WARNING

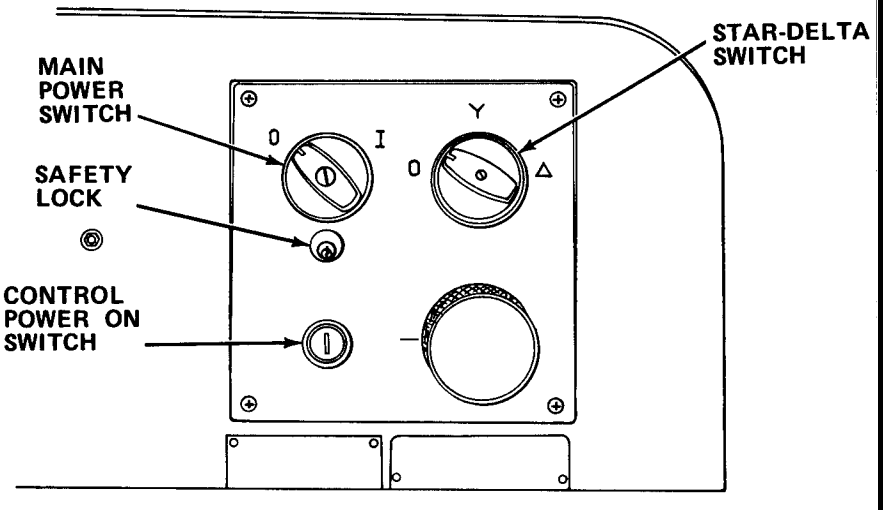
Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.

	5. Perform cut and interrupt light barrier. Knife must stop immediately on the downward stroke when light barrier is broken.	Knife does not stop immediately.
	6. Turn off power.	
	a. Turn Star-Delta switch to Y position, then to O position.	
	b. Turn main power switch to O position.	
	c. Lock the safety lock with operator key.	

Table 5-17. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
7	B	Inspect Backgauge and Measurement Display.	



1. Turn on power.

   a. Unlock safety lock with operator key.

   b. Turn main power switch to I position.

   c. Turn Star-Delta switch to Y position. After main drive motor is at full speed, turn switch to △ position.

   d. Press control power on switch.

2. Move backgauge forward or backward as necessary until backgauge position is displayed on measurement display.

Table 5-17. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

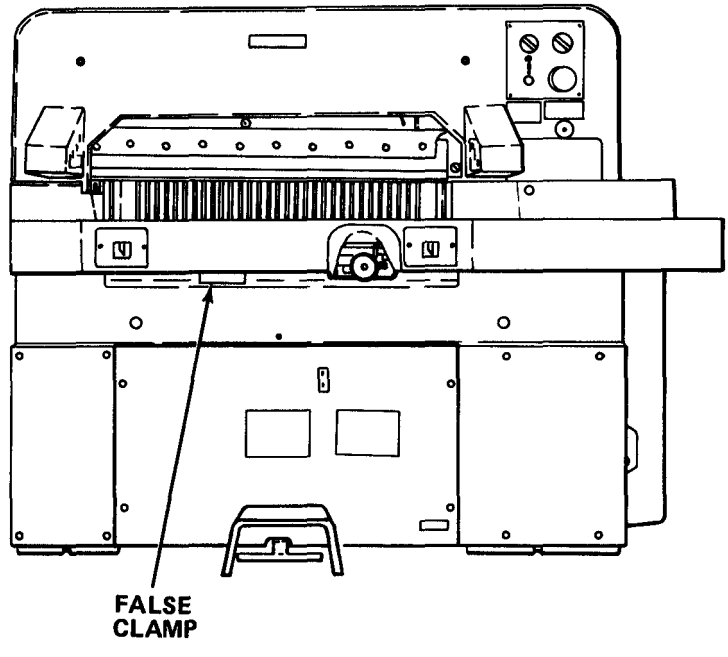
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment is Not Ready/ Available If:
		PAPER CUTTER - Cont	
7	B	Inspect Backgauge and Measurement Display - Cont	
		3. Press button in center of backgauge control knob. Backgauge should move rearward and stop automatically when travel limit is reached. Measurement display should indicate a "+" and the measurement increases.	Backgauge does not stop, or measurement does not indicate a "+" and increase in value.
			
		4. Remove false clamp from its holder under table and install on clamp.	
		5. Pull backgauge control knob outward. Backgauge should move forward, stopping automatically just short of clamp. Measurement display should indicate a "-" and the measurement should decrease.	Backgauge contacts clamp, or measurement display does not indicate a "-" and decrease in value.

Table 5-17. 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

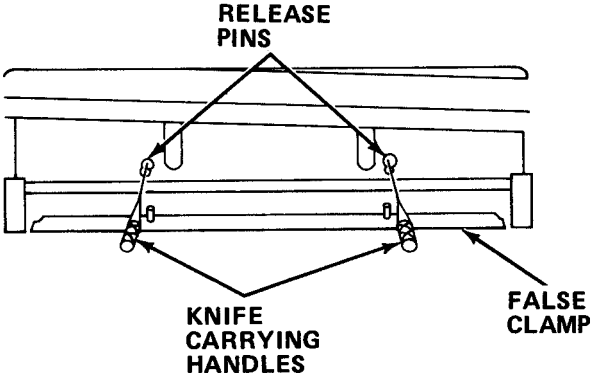
ITEM NO.	INTERVAL	ITEM TO BE INSPECTED / PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
7	B	Inspect Backgauge and Measurement Display - Cont 6. Pull clamp pressure adjust knob and press clamp foot pedal until release pins for the false clamp are visible.  7. Using the knife carrying handles, depress the release pins and remove the false clamp. 8. Insert false clamp into its holder under the table. 9. Push in clamp pressure adjust knob. Step on foot pedal until clamp lowers completely. Then release foot pedal and allow the clamp to rise.	

Table 5-17. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

(Number) - Hundreds of Hours

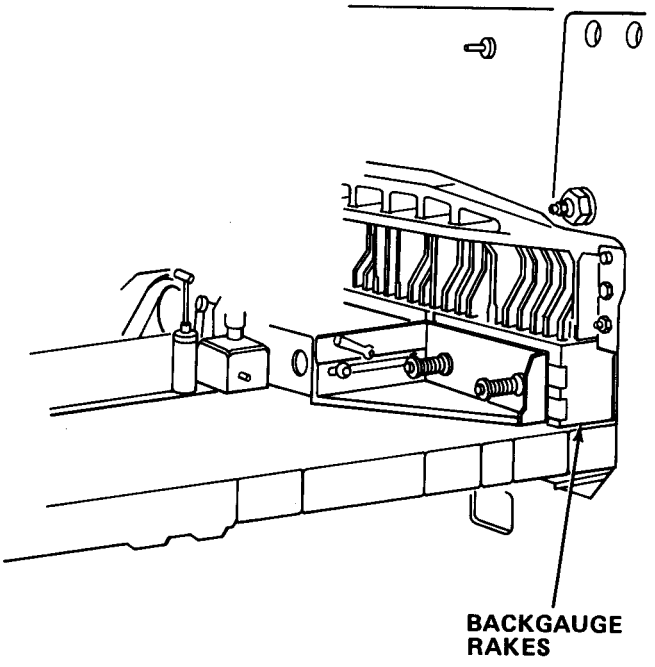
ITEM NO.	IN-TERVAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
7	B	Inspect Backgauge and Measurement Display - Cont	
			
		10. Pull backgauge control knob outward. Backgauge rakes should move forward under clamp and stop short of knife.	Backgauge does not move under clamp.
		11. Press button in center of backgauge control knob. Move backgauge back approximately halfway.	
		12. Press backgauge control knob in until manual drive gears engage.	
		13. Rotate backgauge control knob and backgauge should move easily, indicating that the brake has disengaged.	Backgauge does not move easily.

Table 5-17. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W . Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennial!y

(Number) - Hundreds of Hours

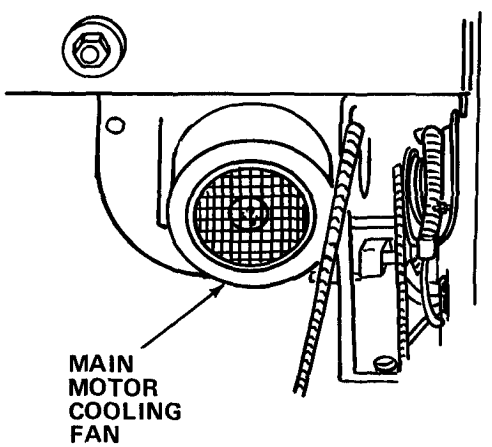
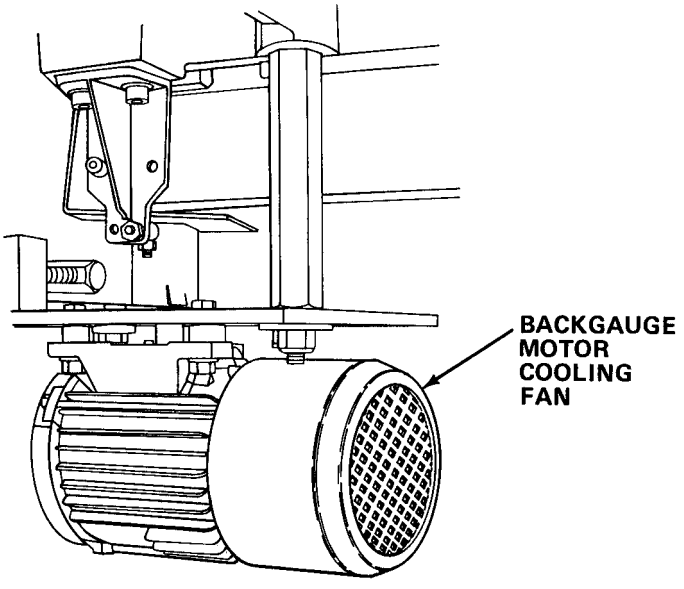
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
7	B	Inspect Backgauge and Measurement Display - Cont	
		4. Turn off power.	
		a. Turn Star-Delta switch to Y position, then to O position.	
		b. Turn main power switch to O position.	
		c. Lock safety lock with operator key.	
8	W	Inspect Main Motor Cooling Fan.	
			
		1. Inspect for buildup of dirt and foreign particles on fan and suction screen of motor.	
		2. Clean by using a vacuum cleaner.	

Table 5-17. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cent

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
9	W	Inspect Backgauge Motor Cooling Fan.	



1. Inspect for buildup of dirt and foreign particles on fan and suction screen of motor.

2. Clean by using a vacuum cleaner.

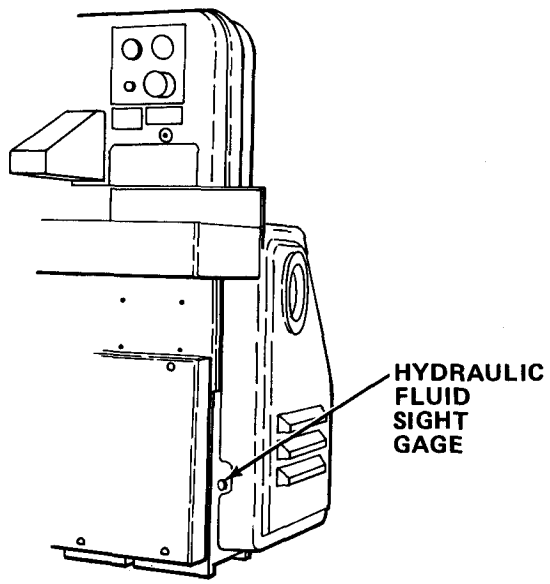
Table 5-17. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

B - Before
D - During
A - After

W - Weekly
M - Monthly
Q - Quarterly

AN - Annually
S - Semiannually
BI - Biennially

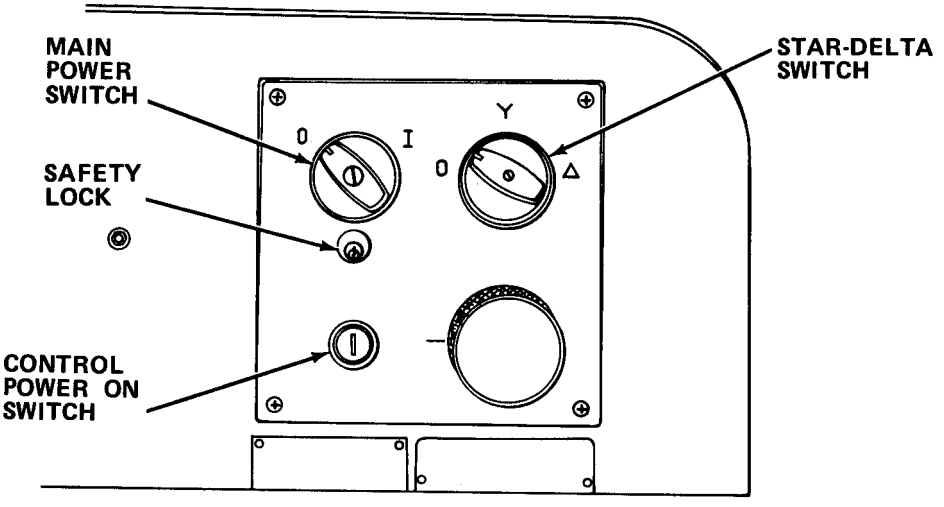
(Number) - Hundreds of Hours

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE	For Readiness Reporting, Equipment Is Not Ready/ Available If:
		PAPER CUTTER - Cont	
10	B	Check Hydraulic Fluid Level and for Leaks in System.	
			
		1. Check fluid sight gage on right pillar. Fluid should be visible in gage.	Hydraulic fluid not visible in sight gage.
		2. Check hydraulic components external to right pillar for leakage.	If class III leaks are present.

5-26. OPERATION UNDER USUAL CONDITIONS.

5-26.1 Operating Procedures.

a. Turn on circuit breaker.



b. Using the operator key, unlock the safety lock.

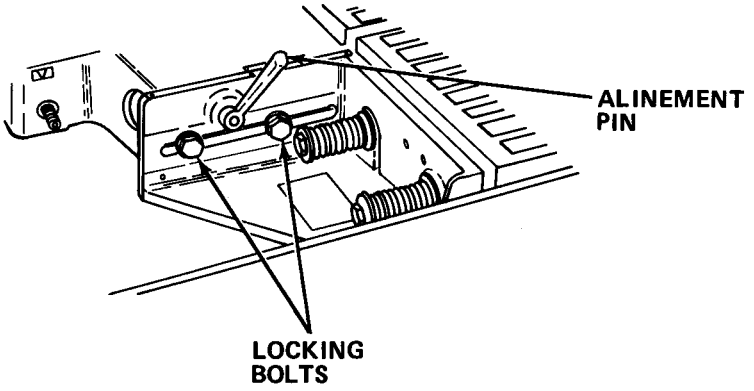
c. Turn main power switch to I position.

d. Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

e. Press control power on switch.

f. Move backgauge forward or backward as required until backgauge position is displayed on the measurement display.

g. Move backgauge to desired cut length.



h. If multiple cuts are to be made at different lengths, set the backgauge side rakes as follows:

(1) Remove alinement pin from side rake being adjusted.

(2) Loosen locking bolts on side of rake.

NOTE

It may be necessary to remove the locking bolts and place them in another hole to obtain proper setting.

(3) Set rake to desired position.

(4) Tighten locking bolts.

WARNING

- Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.
- Always keep the largest area of the material being cut behind the knife. If the larger area is in front of the knife, it could fly up and serious injury may occur.

i. Place paper against backgauge.

NOTE

- Be sure paper is fitted tightly against the backgauge rakes and the side of the table.
- Make like paper cuts from same side of knife assembly.

Refer to Table 5-18 for information on setting clamp pressure and the use of the false clamp.

NOTE

All values indicated in the table are based on manufacturer's experience. The values for the clamp pressure refer to a pile of paper of medium height and more than two thirds of the total cutting width of the cutter. Higher and wider piles of paper need a higher pressure. Lower and narrower piles of paper need less pressure. Delicate materials (thin, soft) need the false clamp.

Table 5-18. RECOMMENDED CLAMPING PRESSURES

Material	Pressure in Kg	Remarks
Bible Paper	1000 - 1500	False clamp
Felt Paper	1500 - 2000	False clamp
Printing Paper (normal)	2000	
Writing Papers	2000 - 2500	
Felt Board	1500 - 2000	
Grey Board	2500	False clamp
Post Card Board	2500	

k. Insert false clamp if necessary.

l. Set clamp pressure.

m. Press clamp foot pedal and clamp paper.

n. Press both cutting buttons (simultaneously) and perform cut.

o. After the knife has returned to its upper position, release the cutting buttons.

p. Release the clamp foot pedal.

q. Remove cut paper.

r. Check to be sure that cut is clean with no burned, over or under cuts, or draw.

s. To perform additional cuts, repeat steps g. - r.

t. If the backgauge rakes were set at different lengths, reset them as follows:

(1) Loosen the locking bolts.

NOTE

It may be necessary to remove the locking bolts and place them in another hole to obtain proper alinement.

(2) Reposition the side rakes so that all rakes are alined.

(3) Insert the alinement pin in through the side rakes. Tap pin into place to be sure side rake is properly positioned.

(4) Tighten locking bolts.

u. Turn Star-Delta switch to Y position and then to O position.

v. Turn main power switch to O position.

w. Using operator key, lock the safety lock.

x. Turn off circuit breaker.

5-26.3 Preparation For Movement.

Prior to moving this section, place the false clamp onto the clamp.

5-27. OPERATION UNDER UNUSUAL CONDITIONS.

This equipment is designed for operation only in a controlled environment,

Section VIII OPERATOR MAINTENANCE

5-28. LUBRICATION INSTRUCTIONS. This equipment does not require lubrication at the operator level of maintenance.

5-29. TROUBLESHOOTING PROCEDURES.

a. The table lists the common malfunctions which you may find during operation or maintenance of the paper cutter, 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.

SYMPTOM INDEX

Table 5-19. TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. MACHINE DOES NOT CUT THROUGH MATERIAL.
Step 1. Check thickness of material.
(a) If material is too thick, reduce height of material to be cut .
(b) If not, proceed to step 2.

Table 5-19. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

1. MACHINE DOES NOT CUT THROUGH MATERIAL - Cont

Step 2. Check to make sure material being cut is not too hard.

(a) If material is too hard, do not attempt to cut material. Equipment damage could occur.

(b) If malfunction persists, refer to organizational maintenance.

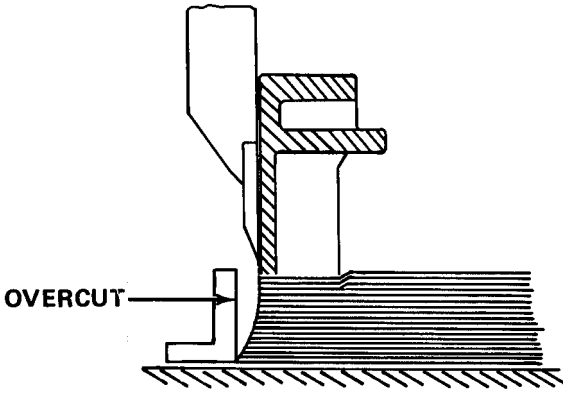
2. BOTTOM SHEET OF MATERIAL IS CUT ONLY ON ONE SIDE OR NOT AT ALL.

Check cutting stick for deep cuts.

(a) If cutting stick has deep cuts, turn or exchange cutting stick (paragraph 5-30.1).

(b) If malfunction persists, refer to organizational maintenance

3. OVERCUT DURING THE CUT. THE KNIFE MOVES FORWARD IN THE MATERIAL SO THAT THE LOWER SHEETS OF THE MATERIAL ARE LONGER.



Step 1. Check that material is properly jogged.

(a) If not, jog material.

(b) If jogged properly, proceed to step 2.

Table 5-19. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

3. OVERCUT DURING THE CUT. THE KNIFE MOVES FORWARD IN THE MATERIAL SO THAT THE LOWER SHEETS OF THE MATERIAL ARE LONGER - Cont

Step 2. Check setting of clamp pressure adjustment knob.

(a) If it is below 1500, then increase clamp pressure by turning clamp pressure adjustment knob to the right one or two marks. Check again for overcut.

NOTE

Different materials require different clamp pressures. Refer to Table 5-18 for proper pressures.

(b) Repeat Step 2 until clamp pressure control knob has been fully turned to the right.

(c) If malfunction persists, refer to organizational maintenance.

4. UNDERCUT DURING THE CUT. THE KNIFE MOVES BACK INTO THE MATERIAL SO THAT THE TOP SHEETS OF THE MATERIAL ARE LONGER.

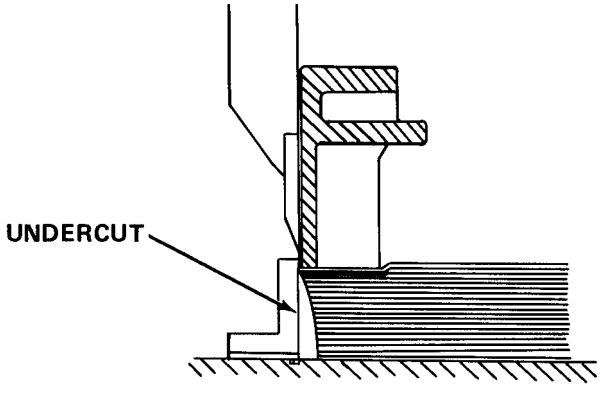


Table 5-19. TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

4. UNDERCUT DURING THE CUT. THE KNIFE MOVES BACK INTO THE MATERIAL SO THAT THE TOP SHEETS OF THE MATERIAL ARE LONGER - Cont

Step 1. Check that material is properly jogged.

(a) If not, jog material.

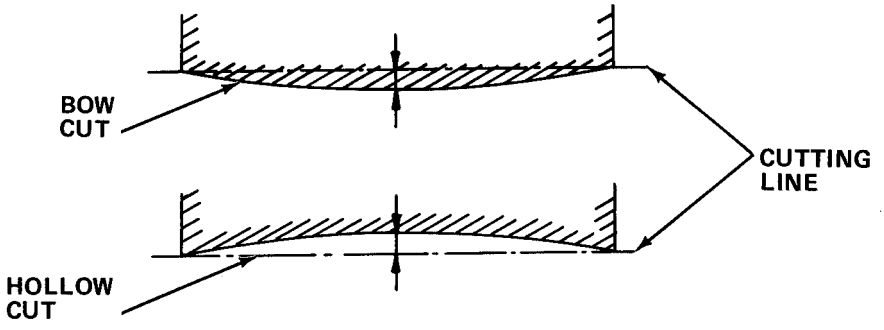
(b) If jogged properly, proceed to step 2.

Step 2. Check that material is not too soft for proper knife cut.

(a) Immaterial is too soft increase clamp pressure.

(b) If malfunction persists, refer to organizational maintenance.

5. BOW OR HOLLOW CUT OBTAINED.



Step 1. Check that material is properly jogged.

(a) If not, jog material.

(b) If jogged properly, proceed to step 2.

Step 2. Check that material is not wavy or warped.

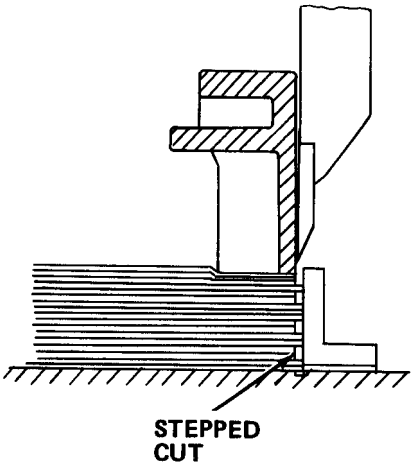
(a) Reduce the clamping pressure as far as possible and start trimming the material from the center.

(b) If malfunction persists, refer to organizational maintenance for replacement of the knife.

Table 5-19. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

6. STEPPED CUTS ARE OBTAINED.



Step 1. Check that material is properly jogged.

(a) If not, jog material.

(b) If jogged properly, proceed to step 2.

Step 2. Check clamp pressure.

(a) If clamp pressure is low, increase clamp pressure by turning clamp adjustment knob.

(b) If malfunction persists, refer to organizational maintenance.

7. NOTCHED CUTTING LINE OBTAINED.

Check for foreign object in cutting material, or nicks in knife.

(a) If foreign object is in cutting material, remove it.

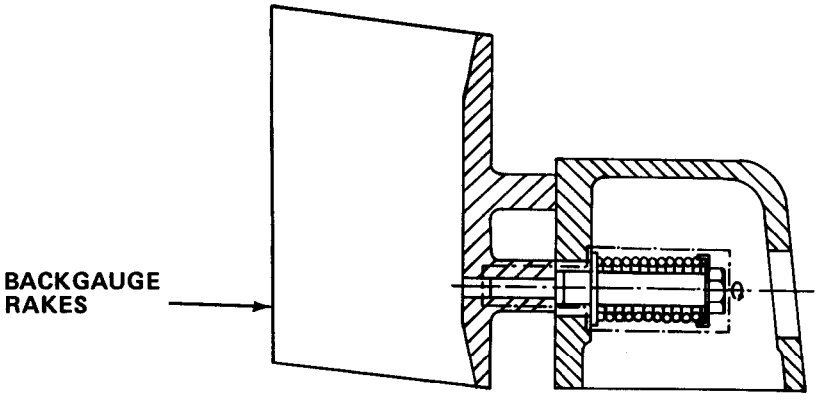
(b) If knife has nicks, refer to organizational maintenance for replacement of knife.

Table 5-19. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

8. BOTTOM SHEET SLIDES UNDER BACKGAUGE RAKES.

Check to be sure there is no gap between bottom front of backgauge rake and table surface. (Surfaces must mate flush.)



Set correct backgauge rake spring tension by screwing tension bolt in as far as it will go (until coils of spring touch each other), then loosen it 1/2 turn.

9. THE KNIFE IS PULLING SHEETS OUT FROM UNDER THE CLAMP DURING A CUT.

Step 1. Check to see if the cutting material is too soft or spongy.

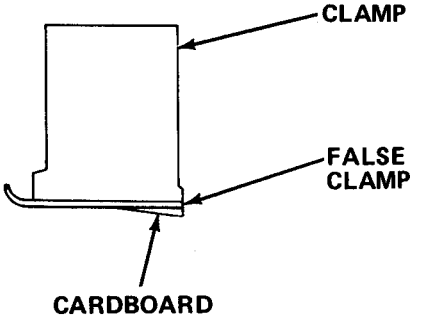


Table 5-19. TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

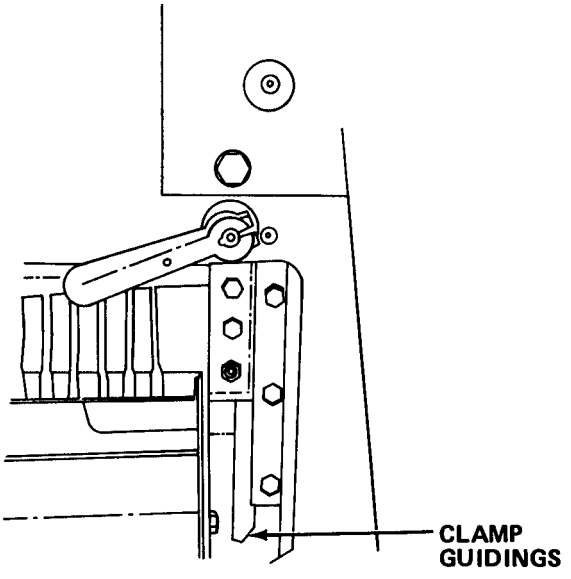
9. THE KNIFE IS PULLING SHEETS OUT FROM UNDER THE CLAMP DURING A CUT - Cont

(a) If material is too soft or spongy, insert the false clamp and perform the following: Glue a 4-5mm thick cardboard strip under the front third of the false clamp. Slant the strip toward the rear so that all the pressure is actually at the very area where the cut takes place. The cardboard should protrude a little from the false clamp and will be cut off at the first cut cycle.

(b) If malfunction persists, refer to direct/general support maintenance.

10. CLAMP DOES NOT DESCEND COMPLETELY WHEN USING FOOT PEDAL.

Step 1. Check for dirty or improperly lubricated clamp guidings.



(a) If dirty or improperly lubricated, clean and lubricate clamp guidings (paragraph 5-31.).

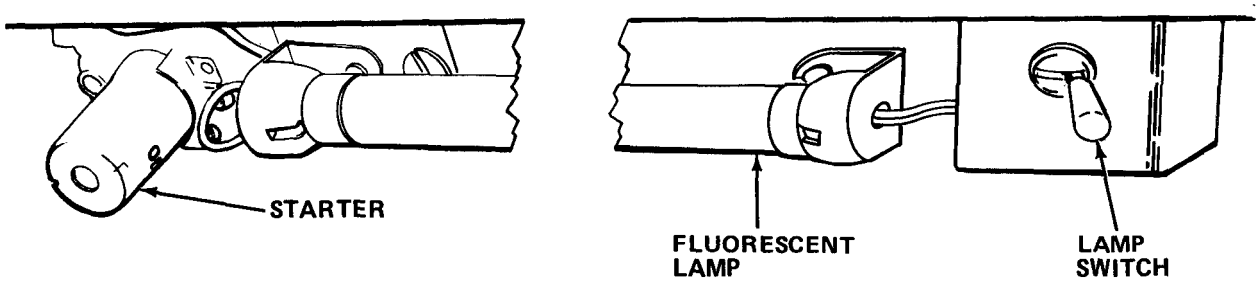
(b) If malfunction persists, refer to organizational maintenance.

Table 5-19. TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

11. FLUORESCENT TABLE LAMP DOES NOT COME ON.

Turn lamp switch to right and then back to left. Check to see if light comes on.



(a) If light does not come on, replace fluorescent lamp (paragraph 5-30.2).

(b) If light does not come on, replace starter (paragraph 5-30.2).

(c) If malfunction persists, refer to organizational maintenance.

12. OPTICAL CUTTING LINE ABSENT.

Press control power on switch. Turn lamp switch to right. Turn off overhead lights above table. Check to see if line appears.

(a) If lights do not come on, replace OCL bulbs.

(b) If malfunction persists, refer to organizational maintenance.

13. OCL TOO WIDE OR FUZZY.

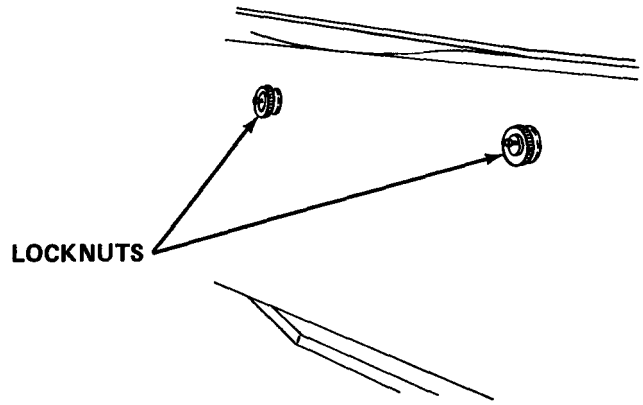
Step 1. Open top cover and check to see if both OCL bulbs are lit.

(a) IF bulbs are not lit, replace burned-out bulb (paragraph 5-30.3).

(b) If lit, proceed to step 2.

Table 5-19. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
13. OCL TOO WIDE OR FUZZY - Cont
Step 2. Check adjustment of OCL bulbs.
(a) Adjust OCL bulbs as follows:



(1) Loosen two locknuts on rear frame holding OCL mounting rods.

(2) Rotate OCL mounting rods while observing cutting line on table. When light from lamp forms clear, sharp line on table, stop. Tighten rod locknut.

(3) Rotate OCL mounting rod for other bulb while observing cutting line on table. When light from lamps forms clear line on table, stop. Tighten rod locknut.

(b) If malfunction persists, refer to organizational maintenance.

Table 5-19. TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
14. MEASURED BACKGAUGE POSITION AND MEASUREMENT DISPLAY ARE NOT IN AGREEMENT. ADJUSTMENT DOES NOT CORRECT PROBLEM, OR BACKGAUGE POSITION DOES NOT STAY SET. Check backgauge guiding rails for dirt or dryness.	(a) If guiding rails are dirty or dry, clean and oil backgauge rails (paragraph 5-31.). (b) If malfunction persists, refer to direct/general support maintenance.

5-30. MAINTENANCE PROCEDURES.

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

5-30.1 Rotate or Replace Cutting Stick.

MOS: 83F, Photolithographer

TOOLS: Flat Tip Screwdriver
Soft Face Hammer

SUPPLIES: Cutting Stick

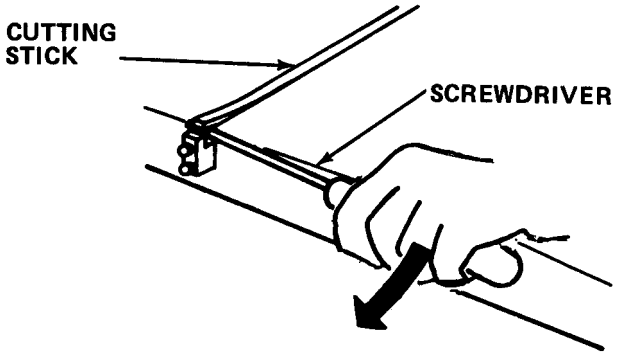
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

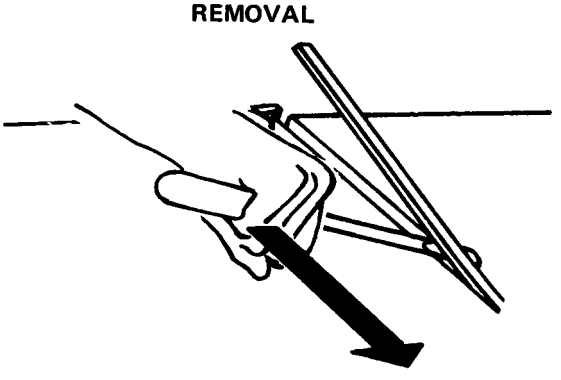
(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock.

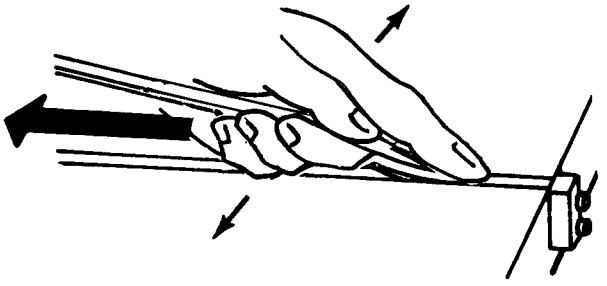
b. Insert screwdriver under end of cutting stick and carefully pry upward.



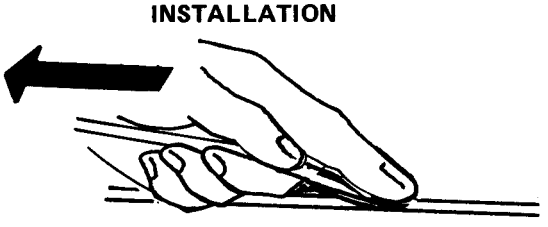
c. Remove cutting stick from groove.



d. Rotate cutting stick to new position or replace with new cutting stick.



e. Reinstall cutting stick into groove.



f. Move stick back and forth with right hand as left hand presses it into the groove.

CAUTION

Do not seat cutting stick with any metallic tool, or damage to table bed may result.

g. Seat cutting stick into groove with soft face hammer.

5-30.2 Replace Fluorescent Lamp or Starter.

MOS: 83F, Photolithographer

SUPPLIES: Fluorescent Lamp
Starter

WARNING

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

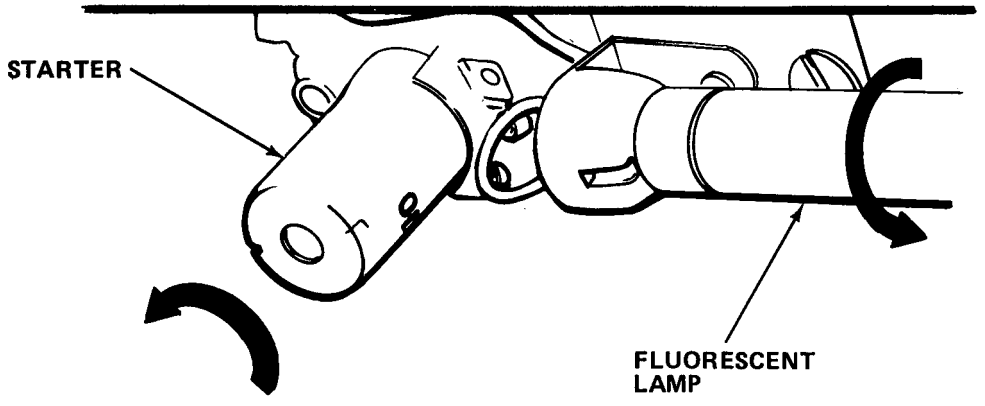
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock.

b. Grasp lamp or starter with fingers and rotate 90 degrees.



c. Extract lamp or starter from holders.

d. Insert new lamp or starter and twist 90 degrees to lock into position.

5-30.3 Replace OCL Lamp(s).

MOS: 83F, Photolithographer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Lamp

WARNING

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

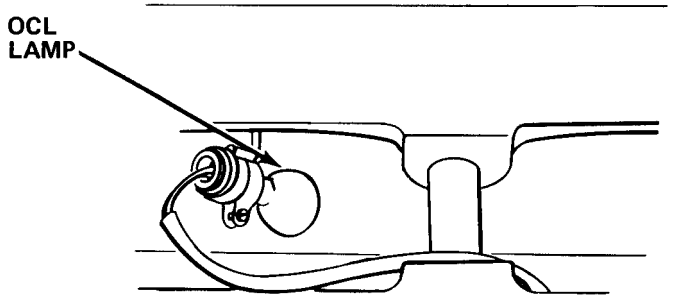
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock.

b. Remove two screws on left end of top cover and position the cover so that easy access to lamps is obtained.



c. Grasp the defective lamp with fingers and rotate to the left to remove.

d. Install new lamp and rotate it to the right to secure.

e. Reinstall the top cover and secure with screws.

f. Using operator key, unlock safety lock.

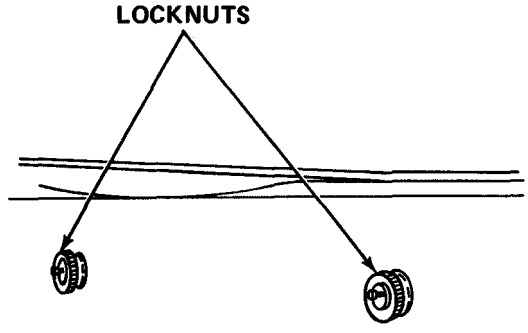
g. Turn on power.

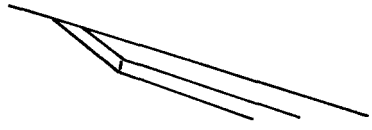
(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

h. Place table lamp switch to the right.





i. Loosen locknut on mounting rod for new OCL lamp and adjust mounting rod until cutting line is bright and sharp. Tighten locknut.

j. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

Section IX ORGANIZATIONAL MAINTENANCE

5-31. LUBRICATION INSTRUCTIONS.

5-31.1 Hard time intervals and the related man-hour times are based on normal operation. The man-hour time specified is the time you need to do all the services prescribed for a particular interval. Change the interval if your lubricants are contaminated or if you are operating the equipment under adverse operating conditions, including longer-than-usual operating hours. The interval may be extended during periods of low activity. If an extended period of low activity is anticipated, adequate preservation precautions must be taken.

5-31.2 On-condition (OC) intervals for oil changes shall be determined by the Army Oil Analysis Program (AOAP) laboratory and shall be applied unless otherwise notified.

5-31.3 Hard time oil change intervals will be applied in the event AOAP laboratory support is not available.

5-31.4 The time specified is the time required to perform all services at the particular interval (on-condition or hard times).

WARNING

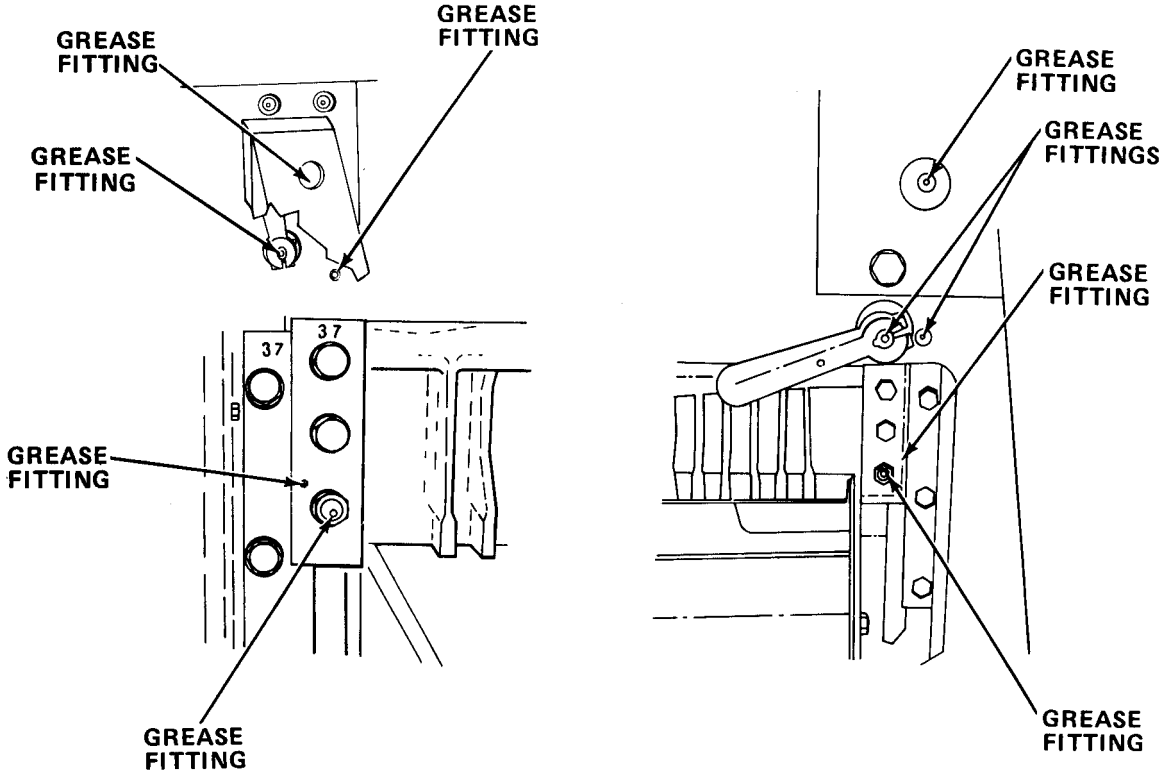
Dry cleaning solvent, P-D-680, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Wear solvent impermeable gloves and eye/face protective equipment when using solvent. Do not use near open flame or excessive heat. Flash point of solvent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

5-31.5 Clean fittings before lubricating. Clean parts with dry cleaning solvent. Dry before lubricating. Drain gear box and hydraulic reservoir when hot. Fill and check levels. The lowest level of maintenance authorized to lubricate a point is organizational maintenance.

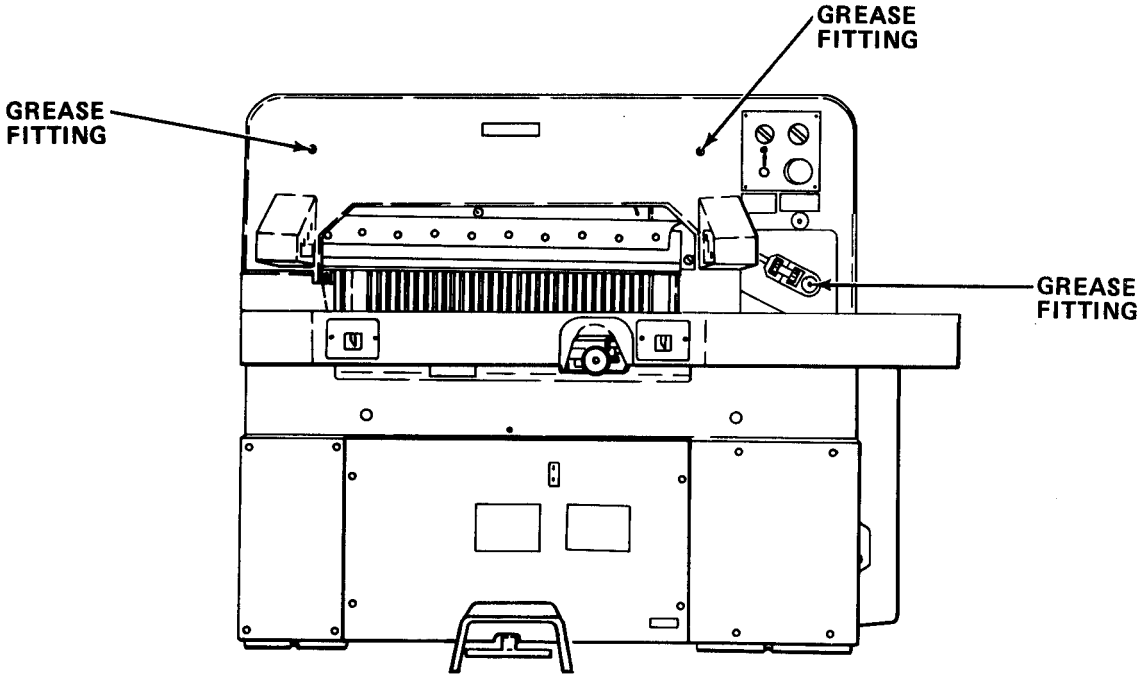
NOTE

To avoid having to bleed the hydraulic system twice, always do annual lubrications together.

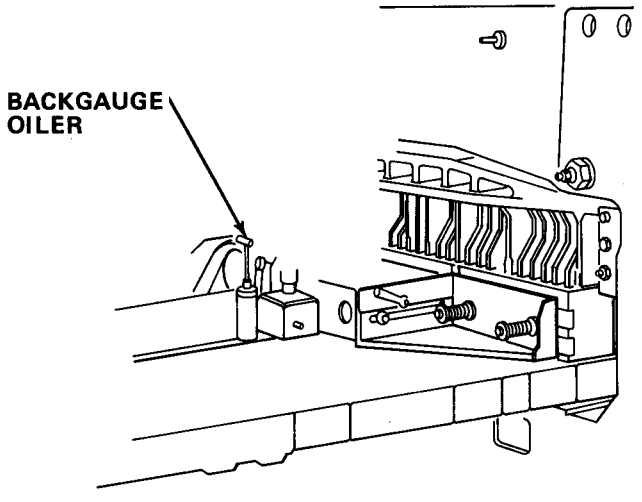
5-31.6 Perform lubrications with the paper cutter off.



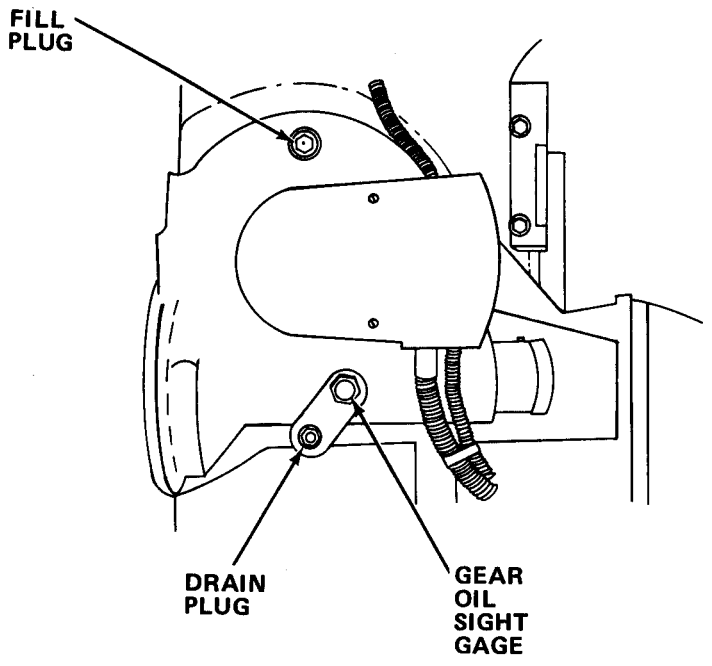
	LUBRICANT	INTERVAL
Knife guiding gibs (See Note 1)	GAA	W
Clamp eccentrics (See Note 1)	GAA	W
Clamp guiding rails (See Note 1)	GAA	W
Frame guiding grooves (See Note 1)	GAA	W



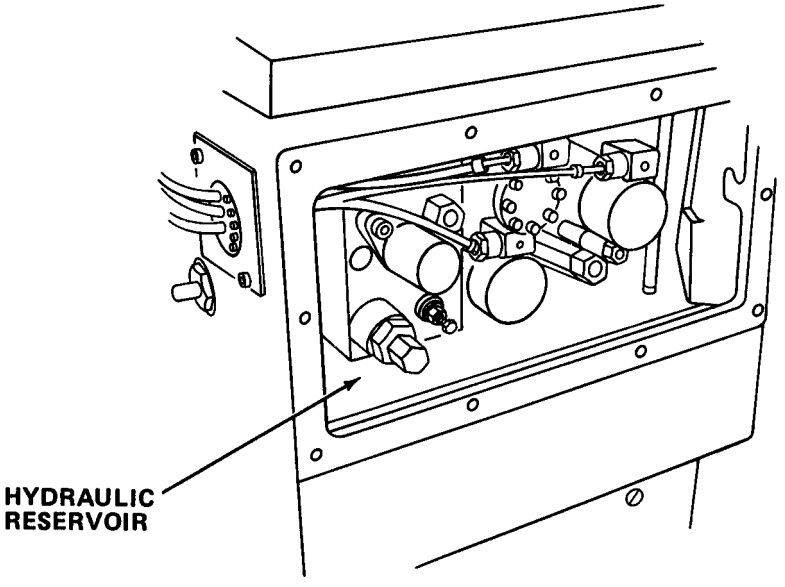
	LUBRICANT	INTERVAL
Frame guiding grooves (See Note 1)	GAA	W
Connecting rod pivot (See Note 1)	GAA	W



Backgauge guiding rails and sledge Lubricate by rotating T handle 1 complete turn, fill with oil as required.	HDO	W



	LUBRICANT	INTERVAL
Main drive gear (See Note 2)	GO-90	A



Hydraulic reservoir (See Note 3)	OHA	A

KEY

TOTAL MAN-HR	
INTERVAL	MAN-HR
A	2.5
W	0.5

LUBRICANT		REFILL CAPACITY	INTERVAL
GAA (MIL-G-10924)	Grease, bearing		W - 20 hours of operation.
	all points	As required	
HDO (MIL-L-2104)	Lubricating oil		A - 1000 hours of operation
	Backgauge	1 pt	
GO-90 (MIL-L-2105)	Gear Oil, 90 Wt		
	Main drive gear	0.6 liters (0.52 qts.)	
OHA (MIL-H-5606)	Hydraulic fluid petroleum base		
	Hydraulic reservoir	17 liters (4.5 gals.)	

NOTES

1. GREASE FITTINGS Every 20 hours of operation, all grease fittings are required to be greased (GAA). To grease, simply insert the grease gun onto fitting and pump grease gun twice.

2. MAIN DRIVE GEAR Remove drain plug and drain gear lubricant into a utility pail and discard. Clean and reinstall plug. To refill, remove filler plug and fill with 0.6 liters (0.52 qts.) of gear oil (GO-90) to bring oil level to top of sight glass. Reinstall fill plug.

3. HYDRAULIC RESERVOIR Remove the front electronics enclosure cover and the right pillar cover. Remove the hydraulic system cover plate. Using a fluid evacuation pump, pump all hydraulic fluid out of hydraulic reservoir and into a 5 gallon pail. Service both hydraulic fluid filters (paragraph 5-40.25). To fill, simply pour 17 liters (4.5 gals.) of hydraulic fluid (OHA) into the reservoir to bring the fluid level to the top of the sight glass. Perform a complete bleed of the hydraulic system (paragraph 5-40.65).

5-32. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT.

5-32.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

5-32.2 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.

5-32.3 Repair Parts. Repair parts are listed and illustrated in the repair parts and special tools list, TM 5-3610-253-24P covering organizational maintenance for this equipment.

5-33. SERVICE UPON RECEIPT.

NOTE

Minimum of four persons are required to service the paper cutter.

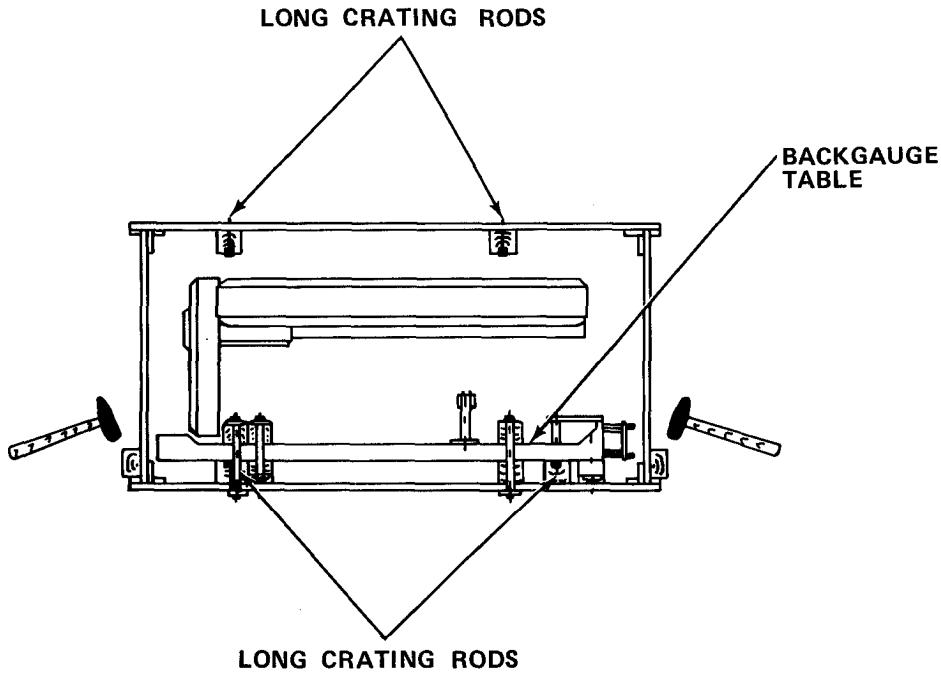
a. The following sequence of steps are used to unpack the crate.

NOTE

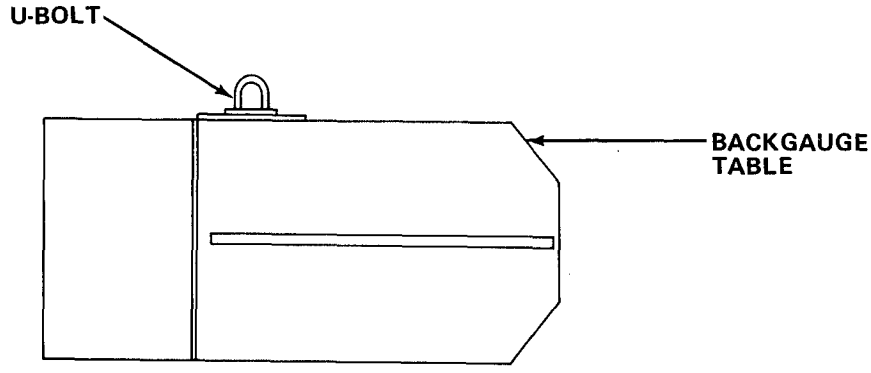
The frame is mounted on two skids. The table is secured between wooden beams. Individual parts and accessories are packed in a wooden box.

(1) Lift the crate approximately 10 cm (4 in.) off the ground and place wooden blocks under all four corners.

(2) Remove nuts on the top of the crate and lift off the lid.



(3) Remove nuts on bottom of the box and take out the long crating rods.



(4) Mount a U-bolt to the side of the backgauge table.

(5) Fix a hoist to the U-bolt and apply tension on the hoist.

(6) Using a hammer, knock loose the side wall on which the table is connected.

WARNING

Serious injury may occur if an inadequate number of personnel are used to move the backgauge table and side wall. This equipment weighs 1050 lbs.

NOTE

All nails have to be removed by pliers or nail puller before the side walls can be removed from the wooden crate.

(7) Lift the hoist and remove the backgauge table and side wall from the crate.

(8) Remove nuts and bolts on side wall that are securing table to side wall. Then remove side wall.

(9) Remove two short side walls.

(10) Remove backgauge from crate.

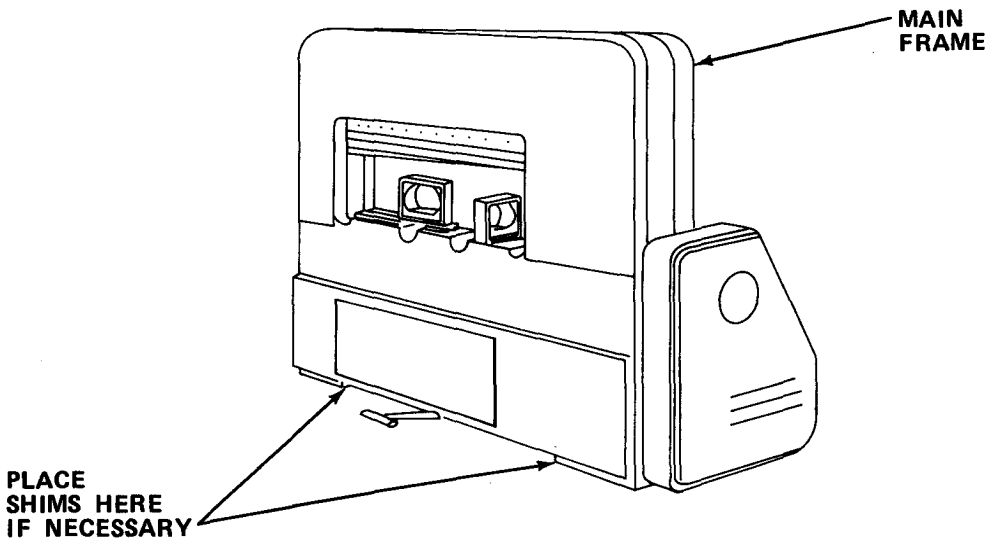
(11) Carefully set the backgauge table down flat onto floor so that the table rests on the wooden blocks attached to table.

(12) Fix hoist to main frame and apply tension on the hoist.

(13) Remove nuts on the frame pillars and push down the bolts.

WARNING

Serious injury may occur if an inadequate number of personnel are used to move the paper cutter. This equipment weighs 3600 lbs.



(14) Remove main frame from crate and position onto mounting frame. Using a level, check that the frame is level. If necessary, place shims under the right or left pillar as needed. Then secure in place with mounting bolts.

(15) Check carefully that all parts have been removed from the box.

b. This crate can be used to ship the defective paper cutter and should not be destroyed.

5-33.1 Checking Unpacked Equipment.

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

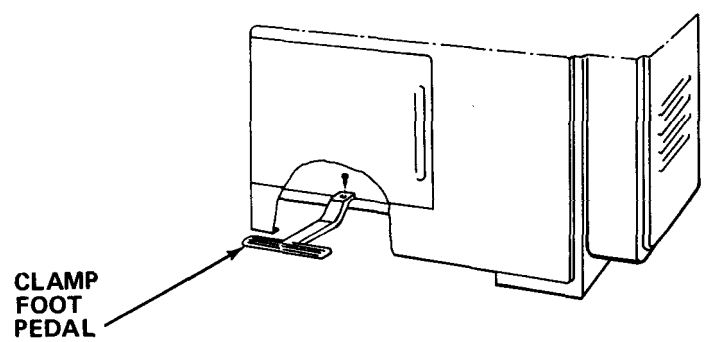
b. Check the equipment against the packing list to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.

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

5-33.2 Deprocessing Unpacked Equipment.

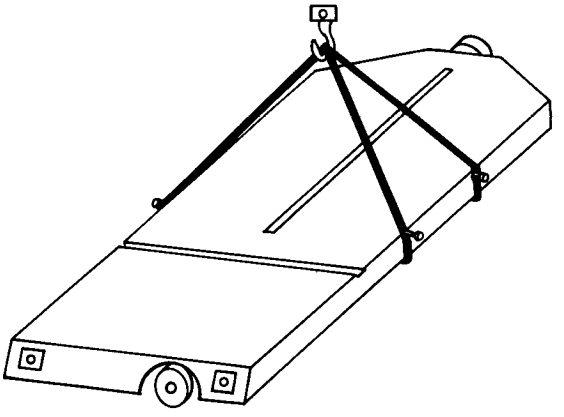
a. The following sequence of steps are used to complete the assembly of the paper cutter.

(1) Remove the rear electronics enclosure cover.



(2) Install the clamp foot pedal.

(3) Remove all rust protection film and dirt from table surfaces.



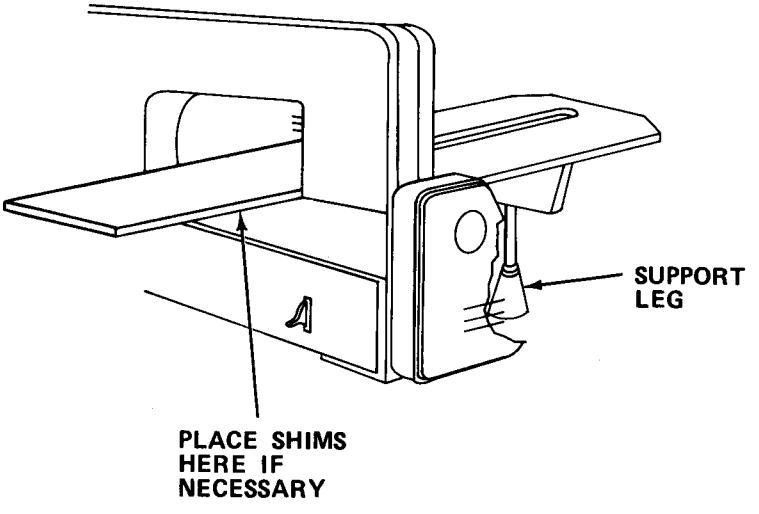
(4) Connect hoist to table in a manner that will allow the top surface to be parallel with the floor when lifting the table.

WARNING

Serious injury may occur if inadequate number of personnel are used to move the table. This equipment weighs 1050 lbs.

(5) Lift the table and direct it behind the frame and into the opening of the frame.

(6) Place the rear support leg under the table and lower hoist so that the table rests on the support leg.



(7) Using a level, level the table with the support leg and add shims if necessary between the table and the frame.

(8) Secure table to frame using all screws.

(9) Remove hoist from table.

(10) Connect all electrical connectors to the proper connections in the electronics enclosure.

(11) Install the left and right light barrier housings to front frame, ensuring that the housings are square to the table and frame.

(12) Connect light barrier plug connectors.

(13) Install the right and left side tables; secure in place with bolts.

(14) Install the table sides to the backgauge table.

(15) Secure the backgauge table to the mounting frame.

(16) Install main motor V-belts (paragraph 5-36.4).

(17) Remove rust protection film and dirt from around and on the sledge.

(18) Install the backgauge onto the sledge. Make sure that all concave washers are fitted between the concave spacer and backgauge. This will give the proper distance 3 mm (.12 in.) between the backgauge and the table.

(19) Install cutting stick (paragraph 5-30.1 steps e. through g.).

(20) Install paper cutter into van (paragraph 5-40.50).

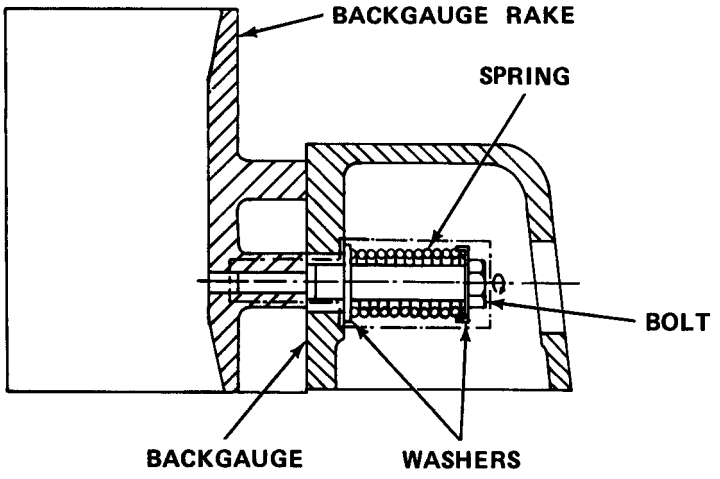
5-33.3 Prepare the Paper Cutter for Use.

a. Clean the paper cutter as follows.

(1) Using grease remover, clean all grease from the bed assembly surfaces including sides and front table.

NOTE

Use care in removing center rake to avoid dropping bolts.



(2) Remove backgauge rakes by removing bolts, washers and springs holding rake to backgauge. Clean bottom and front surfaces of rakes.

NOTE

- Use care in reinstalling center rake to avoid dropping bolts.
- Ensure rakes are flush with table so that one piece of paper cannot slide under rakes.

(3) Reinstall backgauge rakes using bolts, washers and springs. Tighten bolts, then loosen bolts 1/2 turn.

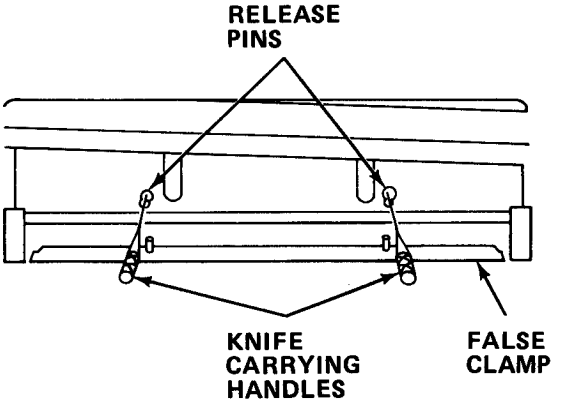
b. Perform light barrier adjustments (paragraph 5-40.62).

Clean knife and knife carrier and perform knife adjustments (paragraph 5-36.11).

d. Clean false clamp and clamp as follows.

(1) Pull out clamp pressure adjustment knob.

(2) Lower clamp to 2 in. above table.



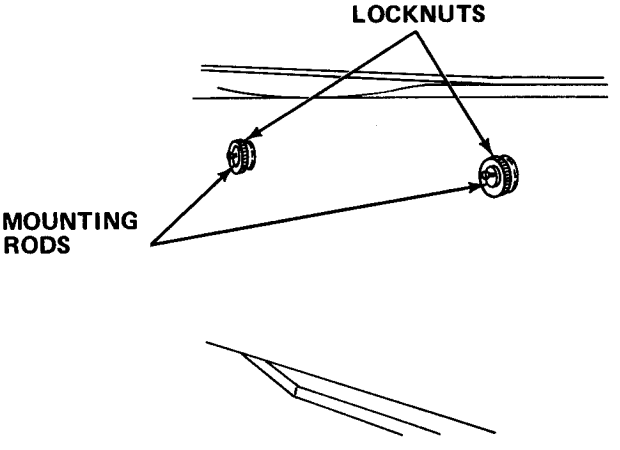
(3) Remove false clamp by depressing both release pins with tips of the knife carrying handles.

(4) Clean the false clamp and clamp.

(5) Reinstall false clamp in storage location under the table.

(6) Press clamp pressure adjustment knob in, then press clamp foot pedal to lower clamp fully. Then release the clamp foot pedal to raise the clamp.

e. Check that knife is square with backgauge by performing backgauge angle adjustment procedure (paragraph 5-36.20).

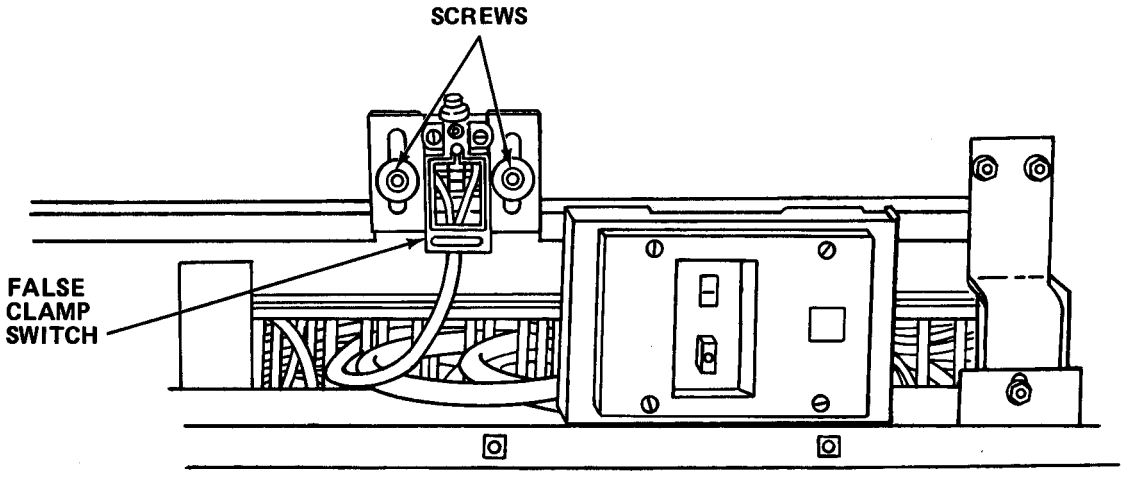


f. Adjust OCL by loosening locknuts and moving mounting rods in, out, and around, until cutting line is bright and sharp.

g. Oil backgauge in accordance with paragraph 5-31, lubrication instructions.

h. Check adjustment of false clamp switch (S6) by moving the backgauge fully forward. Check that backgauge rakes come far enough up to intertwine with the rakes of the clamp. Perform following steps if adjustment is required.

(1) Remove front electronics enclosure cover.



(2) Loosen screws on false clamp switch and move it up or down until switch is activated by false clamp.

(3) Reinstall front electronics enclosure cover.

i. Wax table surfaces as follows.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock the safety lock.

(4) Wax all table surfaces.

j. Adjust backgauge (paragraph 5-36.15).

k. Adjust power supplies (paragraph 5-40.63).

l. Adjust measurement display (paragraph 5-40.60).

m. Adjust table stop bolts and limit switches (paragraph 5-36.17).

n. Bleed hydraulic system (paragraph 5-40.65).

5-34. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

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

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

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

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

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

Item	Quantity
6 mm Hex Head Key Wrench	1 ea
17 mm Combination Wrench	1 ea
19 mm Combination Wrench	1 ea
24 mm Combination Wrench	1 ea
Flat Tip Screwdriver	1 ea

Table 5-20. 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

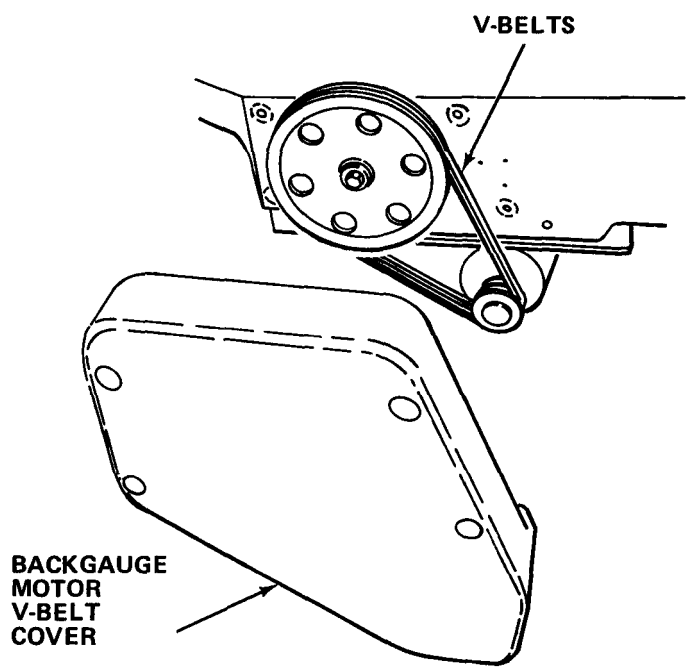
ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PAPER CUTTER
1	M	Inspect Backgauge V-Belts

1. Turn off power.

   (a) Turn Star-Delta switch to Y position, then to O position.

   (b) Turn main power switch to O position.

   (c) Using operator key, lock safety lock.

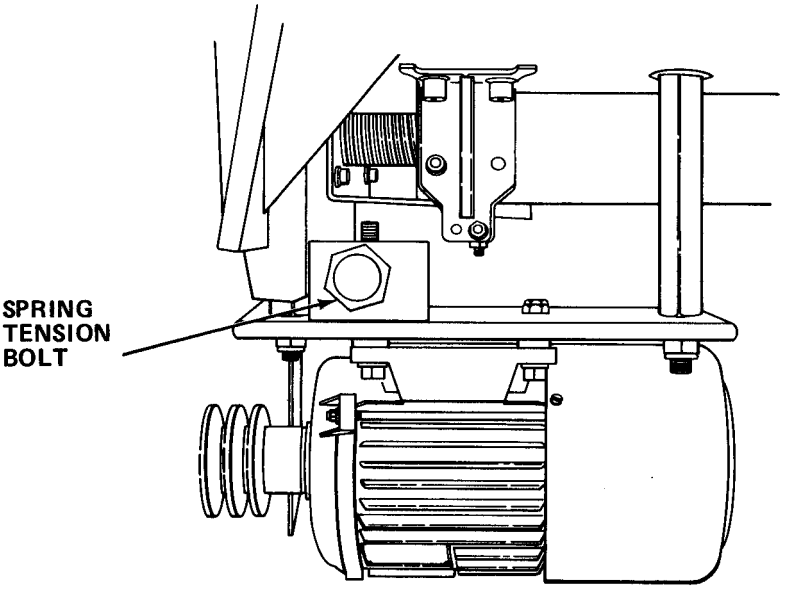


2. Remove backgauge motor V-belt cover.

Table 5-20. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	IN-TER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PAPER CUTTER - Cont
1	M	Inspect Backgauge V-Belts - Cont
		3. Inspect V-belts for wear, cracking, or oil deposits. Replace if defective.



4. Check V-belts' deflection. Deflection should be 6-9 mm (1/4 - 3/8 in.). If deflection differs from specifications, adjust V-belts by rotating spring tension bolt until proper tension is received.

5. Reinstall backgauge motor V-belt cover.

Table 5-20. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

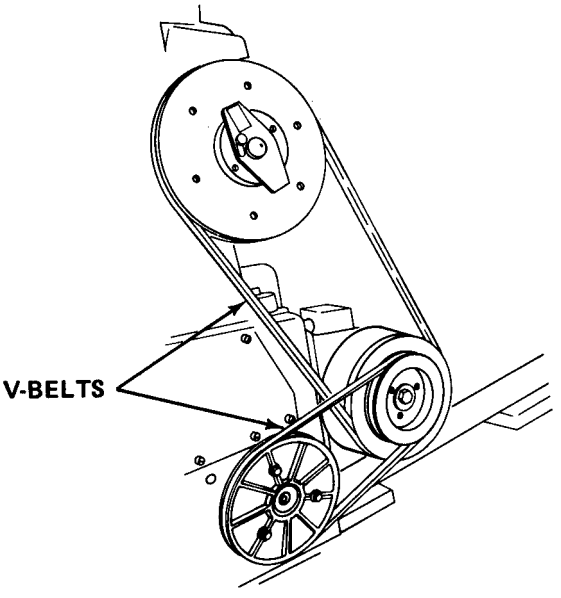
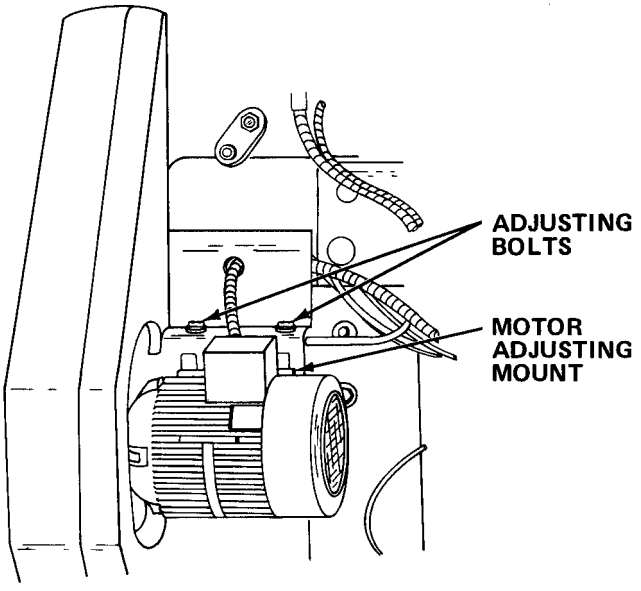
ITEM NO.	INTER-VAL	ITEM TO BE INSPECTED PROCEDURE
		PAPER CUTTER - Cont
2	M	Inspect Main Motor V-Belts. 1. Turn off power. a. Turn Star-Delta switch to Y position, then to O position. b. Turn main power switch to O position. c. Using operator key, lock safety lock. 2. Remove main motor V-belt cover.  3. Check V-belts for wear, cracking or oil deposits. Replace if defective.

Table 5-20. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES - Cont

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

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED PROCEDURE
		PAPER CUTTER - Cont
2	M	Inspect Main Motor V-Belts - Cont



4. Check V-belts' deflection. Deflection should be 10 mm (5/8 in.). If deflection differs from specifications, adjust V-belts by:

   a. Loosen locknuts on underside of motor adjusting mount.

   b. Turn adjusting bolts to the right to tighten V-belts, or to the left to loosen V-belts. Be sure to turn both bolts the same amount each time to maintain pulley alinement.

   c. Tighten locknuts on underside of motor adjusting mount.

5. Reinstall main motor V-belt cover.

5-35. 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 not corrected by a listed corrective action, notify your supervisor.

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

d. Prior to using the troubleshooting procedures for electrical malfunctions, always check plug connections and fuses.

e. Prior to using the troubleshooting procedures for hydraulic malfunctions, always check for loose or leaky pipe connections.

SYMPTOM INDEX

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

1. MACHINE DOES NOT CUT THROUGH MATERIAL.

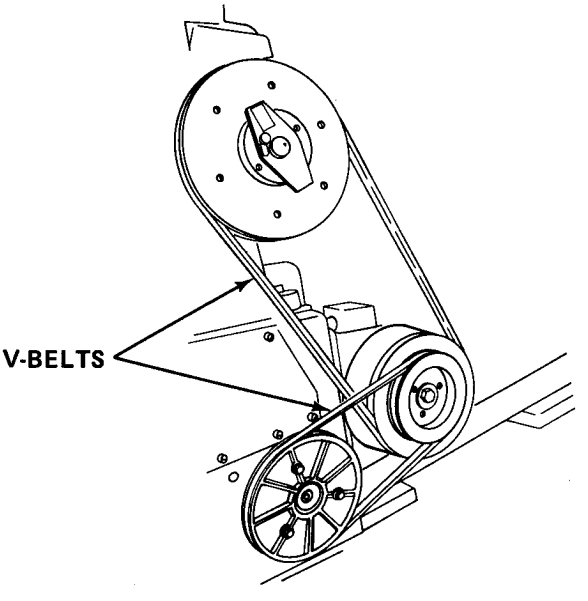
Step 1. Check for dull knife.

(a) If knife is dull, replace knife (paragraph 5-36.11).

(b) If not, proceed to step 2.

Step 2. Check main motor V-belts for proper tension.

(a) If V-belt is out of adjustment, perform V-belt adjustments for a 10 mm (3/8 in.) deflection (Table 5-20).



(b) If not, proceed to step 3.

Step 3. Check main motor V-belts for fray or wear.

(a) If frayed or worn, replace V-belts (paragraph 5-36.4).

(b) If not, proceed to step 4.

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

1. MACHINE DOES NOT CUT THROUGH MATERIAL - Cont

Step 4. Check main motor V-belts for oil.

(a) If belt is contaminated with oil, repair oil leak and replace V-belt (paragraph 5-36.4) and refer to direct/general support maintenance for correction of class III oil leak.

(b) If not, proceed to step 5.

Step 5. Check for oil on brake and clutch linings.

(a) If contaminated, clean clutch and brake linings and check hydraulic components and connections for leaks.

(b) If leaks are present, refer to direct/general support maintenance for repair of Class III leakage.

(c) If not, replace clutch and/or brake linings (paragraph 5-36.1 or 5-36.2).

2. BOTTOM SHEET OF MATERIAL IS CUT ONLY ON ONE SIDE OR NOT AT ALL.

Check that the knife is not parallel to the table. To correct this, proceed as follows:

Correct for proper parallel cut as follows:

(1) Loosen the locknut on the eccentric for the side that does not cut.

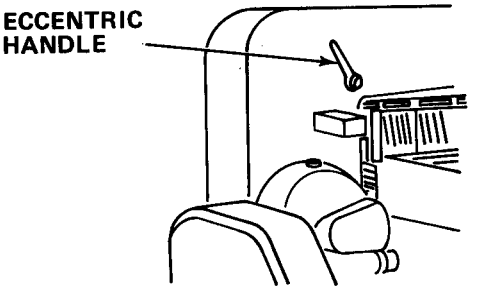


Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

2. BOTTOM SHEET OF MATERIAL IS CUT ONLY ON ONE SIDE OR NOT AT ALL - Cont

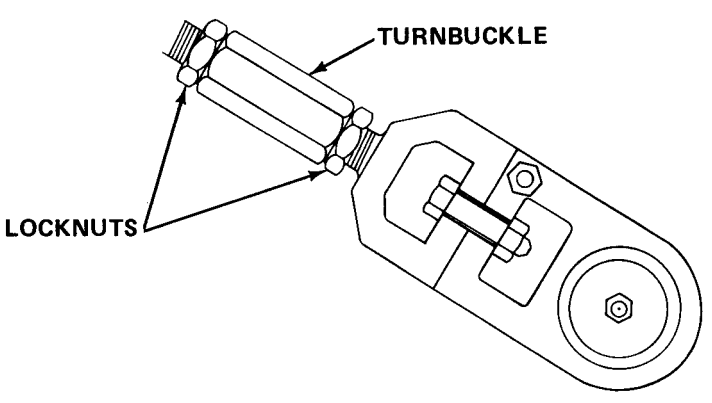
(2) Using the handle, rotate the eccentric and lower the knife.

(3) Tighten the locknut, and check with another cut.

NOTE

If eccentric cannot be adjusted enough to correct the problem, perform steps (4) thru (7).

(4) Remove the eccentric cover.



(5) Loosen the locknuts on the turnbuckle.

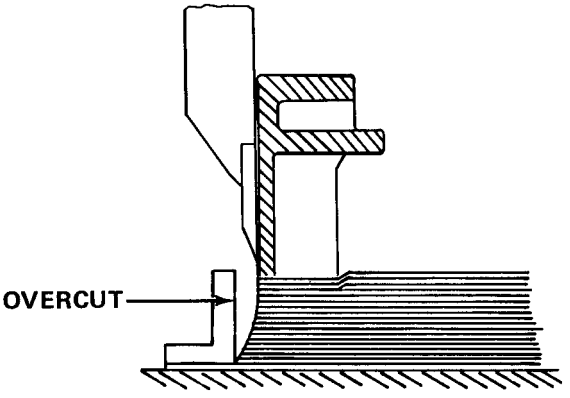
(6) Turn the turnbuckle 1/4 of a turn, and then make a cut. Continue to repeat steps (1) through (6) until problem is corrected.

(7) Tighten turnbuckle locknuts, and reinstall eccentric cover.

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

3. OVERCUT DURING THE CUT.



WARNING

- Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.
- Always keep the largest area of the material being cut behind the knife. If the larger area is in front of the knife, it could fly up and serious injury may occur.

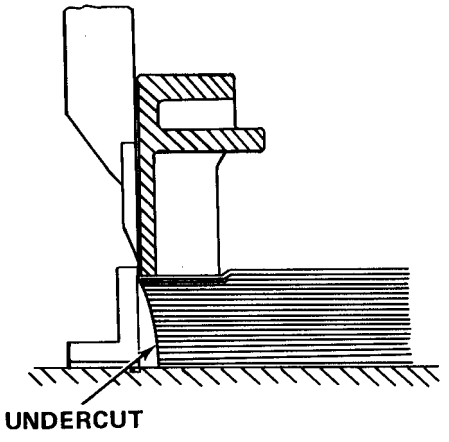
Step 1. Install a new cutting stick. Make a cut without paper, noting knife cut mark in cutting stick; then load cutter with a stack of map stock approximately 63.5 mm (2 1/2 in.) in height. Make a cut, checking the reason for the overcut as follows:

(a) If cutting stick receives a second line in front of first marking, replace the knife (paragraph 5-36.11).

(b) If there is no second mark on stick proceed to Step 2.

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
3. OVERCUT DURING THE CUT - Cont
Step 2. Check that backgauge is square to knife carrier.
(a) If backgauge is out of square, adjust backgauge (paragraph 5-36.20).
(b) If malfunction persists, refer to direct/general support maintenance.
4. UNDERCUT.



Check for dull or burred knife edge.

(a) If dull or burred, replace knife (paragraph 5-36.11).

(b) If malfunction persists, refer to malfunction 3, step 2.

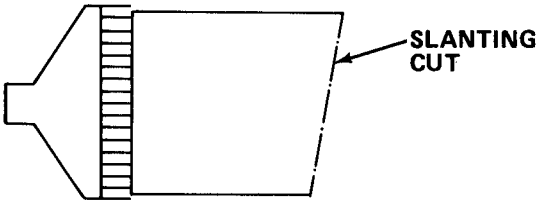
Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

5. SLANTING CUT.



Step 1. Check that backgauge is parallel to knife.

(a) If backgauge is not parallel to knife, adjust backgauge (paragraph 5-36.15).

(b) If backgauge is parallel, proceed to step 2.

Step 2. Check sledge guiding for play.

(a) If sledge guiding is loose, adjust as necessary (paragraph 5-36.16).

(b) If malfunction persists, refer to direct/general support maintenance.

6. ROUGH AND FUSED TOGETHER CUTS.

Check to see if knife is blunt.

(a) If knife is blunt, replace knife (paragraph 5-36.11).

(b) If malfunction persists, refer to direct/general support maintenance.

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

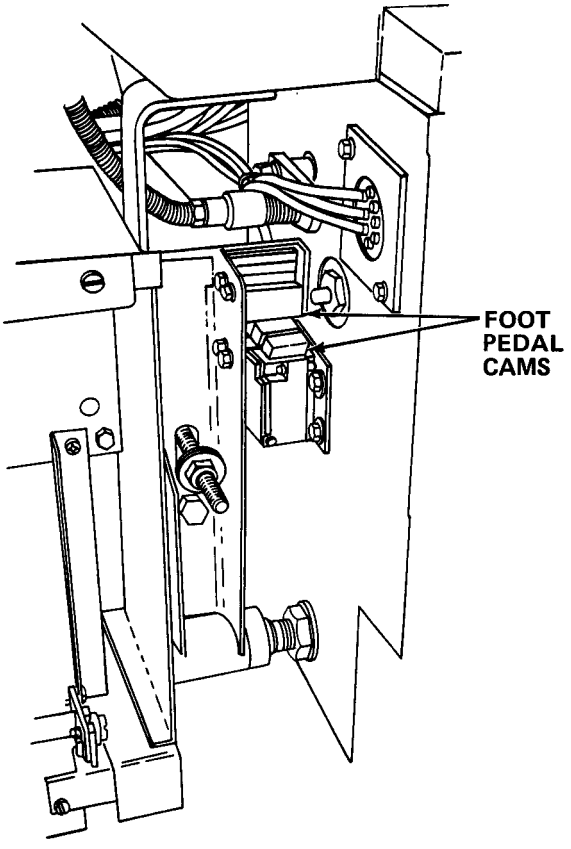
MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
7. WARPED CUTTING LINE.
Check knife for burrs and knife position in carrier.
(a) If knife has burrs, replace knife (paragraph 5-36.11).
(b) If knife is not properly positioned in knife carrier, reposition knife (paragraph 5-36.11).
8. NOTCHED CUTTING LINE.
Check knife for chips and/or nicks.
(a) If knife is chipped or nicked, replace knife (paragraph 5-36.11).
(b) If malfunction persists, refer to direct/general support maintenance.
9. CLAMP DOES NOT DESCEND COMPLETELY WHEN USING THE FOOT PEDAL.
Step 1. Check for loose foot pedal.
(a) If loose, retighten foot pedal (paragraph 5-36.18).
(b) If not, proceed to step 2.
Step 2. Check adjustment of cams on foot pedal.
(a) If out of adjustment, perform foot pedal adjustments (paragraph 5-36.18).
(b) If problem persists, proceed to step 3.
Step 3. Check return spring for proper tension.
(a) If spring tension is improper, perform return spring adjustments (paragraph 5-36.19).
(b) If malfunction persists, refer to direct/general support maintenance.

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
10. CLAMP MOVES DOWN TOO SLOWLY DURING CUTTING CYCLE. Check for loose or leaky connections in the hydraulic system. (a) If loose or leaky, retighten connections. (b) If malfunction persists, refer to direct/general support maintenance.
11. ROUGH FOOT PEDAL MOVEMENT. Check foot pedal cams for wear or looseness. (a) If loose, adjust foot pedal cam (paragraph 5-36.18).

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
11. ROUGH FOOT PEDAL MOVEMENT - Cont	
(b) If worn, replace foot pedal cams as follows:	



(1) Remove front electronics enclosure cover.

(2) Remove screws and defective cam.

(3) Install new cam and secure with screws.

(4) Perform clamp foot pedal adjustments (paragraph 5-36.18).

(c) If malfunction persists, refer to direct/general support maintenance.

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
12. CLAMP DOES NOT DESCEND.
Check clamp foot pedal switch adjustment.
(a) If out of adjustment, adjust cl amp foot pedal switch (paragraph 5-36.18).
(b) If malfunction persists, refer to direct/general support maintenance.
13. CLAMP IS RETURNING TOO SLOWLY, OR CLAMP DOES NOT RETURN AT ALL.
Check clamp return spring tension.
(a) If tension out of adjustment, adjust clamp return spring (paragraph 5-36.19). Be sure not to induce malfunction 9.
(b) If adjustment does not correct problem or return spring is broken, replace clamp return spring (paragraph 5-36.10).

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
14. CLAMP HESITATES BEFORE GOING DOWN.	Check adjustment of foot pedal cams.	(a) If out of adjustment, adjust foot pedal cams (paragraph 5-36.18). (b) If malfunction persists, refer to direct/general support maintenance.

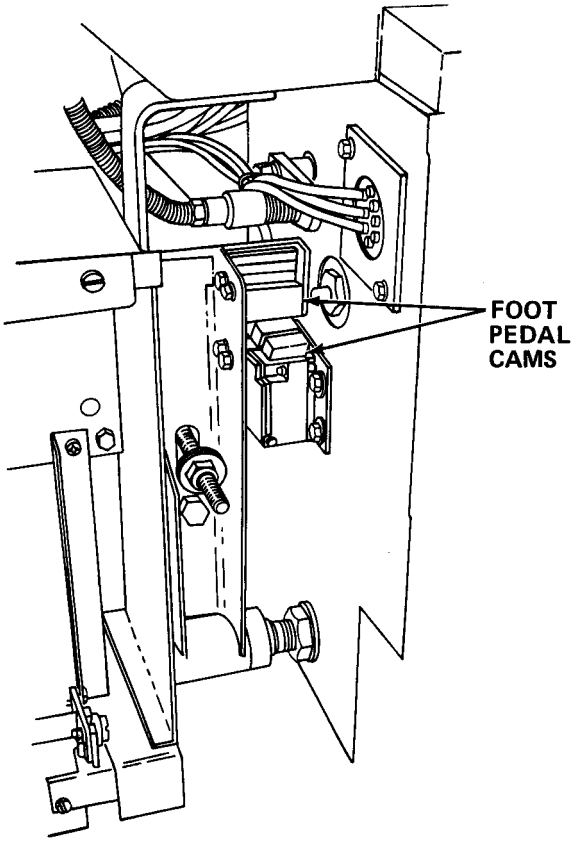


Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

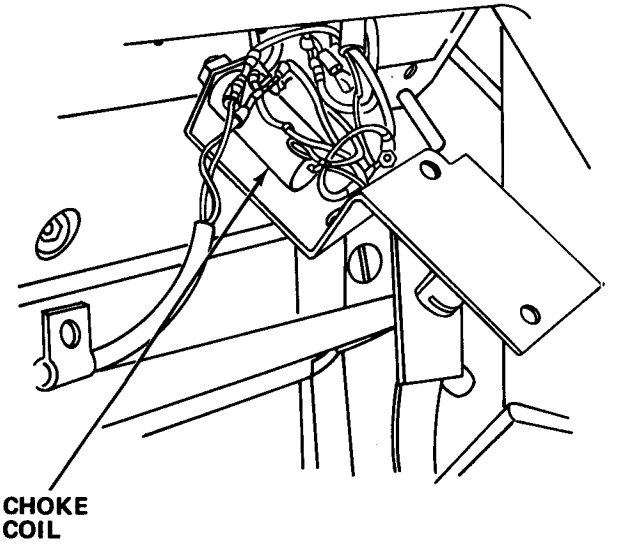
CORRECTIVE ACTION

15. FLUORESCENT TABLE LAMP DOES NOT COME ON.

WARNING

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

Step 1. Check for loose or broken wires to choke coil terminals of lamp switch.



(a) If loose or broken, reconnect wires to choke coil terminals.

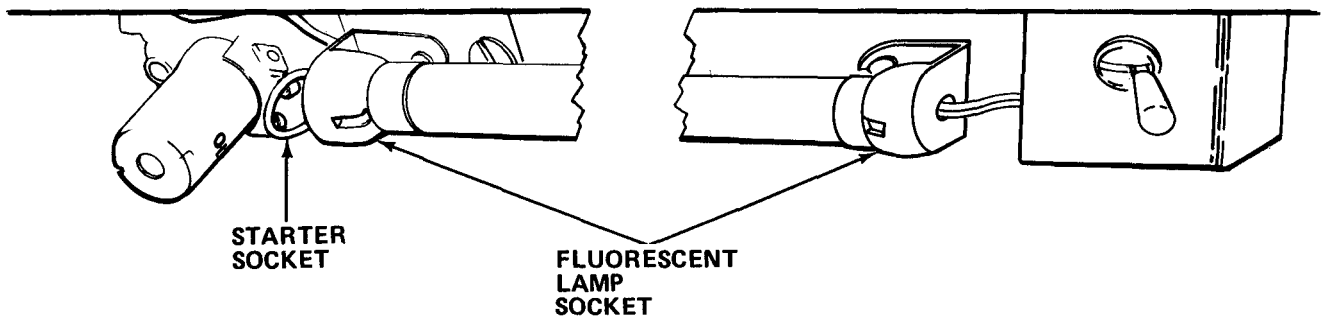
(b) If wiring is correct, proceed to step 2.

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

15. FLUORESCENT TABLE LAMP DOES NOT COME ON - Cont

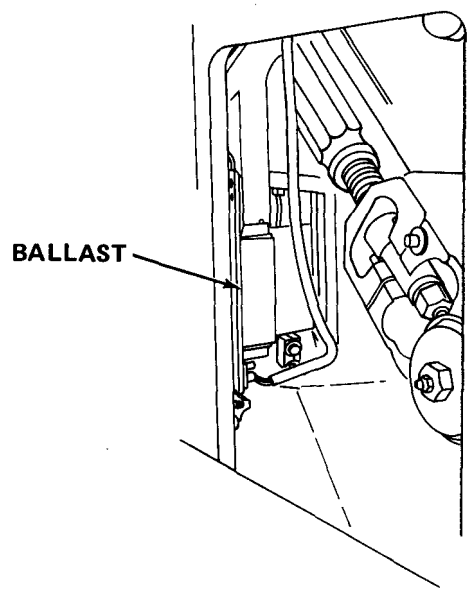
Step 2. Check that wires have not come loose at sockets of fluorescent lamp or starter.



(a) If wires are loose or broken, reconnect wires.

(b) If wiring is correct, proceed to step 3.

Step 3. Check for continuity through ballast using a multimeter.



(a) If multimeter shows no continuity, replace ballast (paragraph 5-36.13).

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
15. FLUORESCENT TABLE LAMP DOES NOT COME ON - Cont
(b) If continuity is present, proceed to step 4.
Step 4. Check fluorescent lamp switch for continuity.
(a) If continuity is not present, replace switch (paragraph 5-36.13).
(b) If continuity is present, proceed to step 5.
Step 5. Check capacitor for shorts.
(a) If defective, replace capacitor (paragraph 5-36.13).
(b) If malfunction persists, refer to electrical schematic and troubleshoot.
16. ONLY ONE OCL LAMP COMES ON.
WARNING Death or serious injury may occur from electrical shock unless power is turned off before servicing.

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

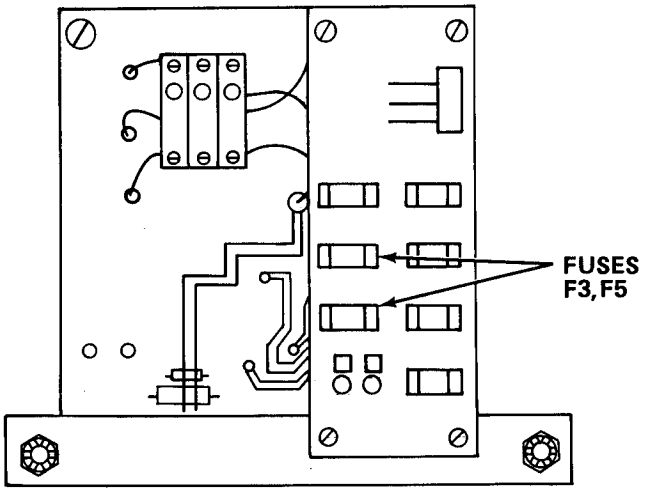
TEST OR INSPECTION

CORRECTIVE ACTION

16. ONLY ONE OCL LAMP COMES ON - Cont

Step 1. Check fuse F3 or F5 for open continuity.

(a) If fuse open, replace defective fuse.



(b) If malfunction persists, refer to electrical schematic and troubleshoot.

17. BACKGAUGE DOES NOT OPERATE ELECTRICALLY.

Step 1. Remove backgauge V-belt cover and check for motor operation.

(a) If motor operates, adjust or replace V-belts (paragraph 5-36.6).

(b) If motor does not operate, proceed to step 2.

Step 2. Check to see that backgauge motor overload relay is on (I), and not tripped.

(a) Reset overload relay. If relay trips again, proceed to step 5.

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

17. BACKGAUGE DOES NOT OPERATE ELECTRICALLY - Cont

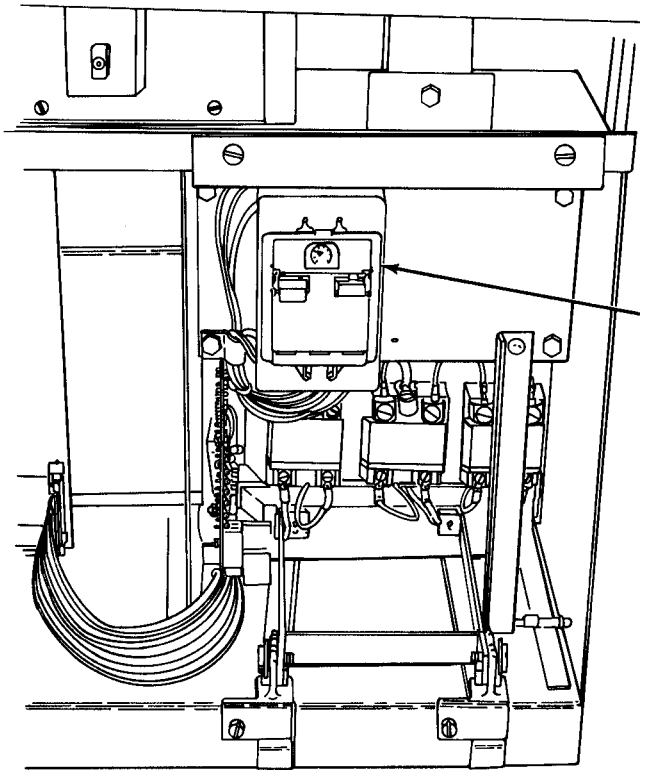
(b) If relay does not trip again and backgauge is still inoperable, proceed to step 3.

Step 3. Check output of backgauge overload relay.

a. Turn Star-Delta switch to Y position, then to O position.

b. Turn main power switch to O position.

c. Remove front electronics enclosure cover.



d. Remove backgauge overload relay cover.

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

17. BACKGAUGE DOES NOT OPERATE ELECTRICALLY - Cont

e. Turn main power switch to I position.

f. Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position. Then press control power on switch.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

g. Check for 120 ± 5 V ac at output of three contacts on overload relay while using backgauge controls.

(1) If voltage is present, proceed to step 5.

(2) If voltage is not present, proceed to step 4.

Step 4. Check for 120±5 V ac at input of three contacts on overload relay while using backgauge controls.

(a) If voltage is present, replace overload relay (paragraph 5-36.8).

(b) If voltage is not present, refer to direct/general support maintenance.

Step 5. Check resistance on backgauge motor windings.

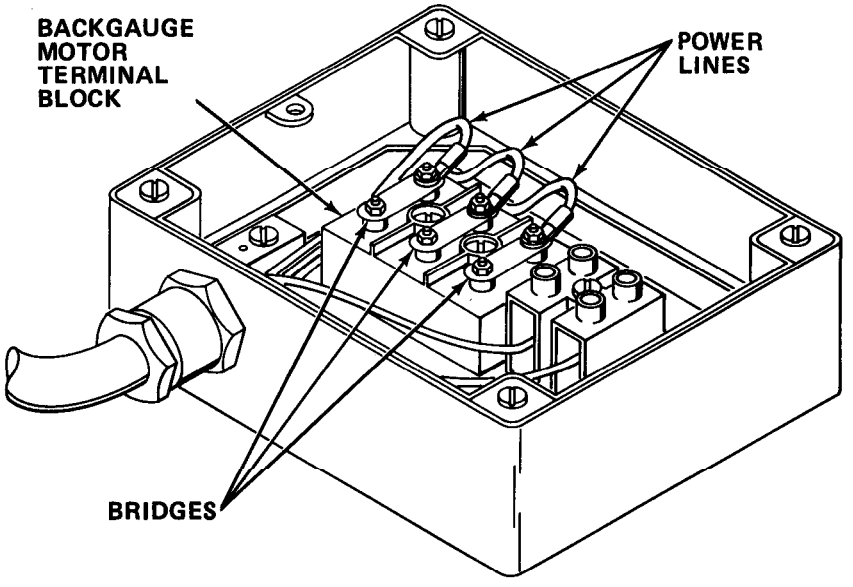
Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

17. BACKGAUGE DOES NOT OPERATE ELECTRICALLY - Cont



Remove terminal cover from motor and disconnect power line and bridges from backgauge motor terminal block. Take ohmmeter readings across terminals according to chart below, and be sure that all three readings are in range indicated below.

THREE-PHASE MOTOR TESTS

Test Lines at Terminals	Correct Ohmmeter Readings
U and X	3-5 ohms
V and Y	3-5 ohms
W and Z	3-5 ohms

(a) If readings are incorrect, replace backgauge motor (paragraph 5-36.7).

(b) If readings are correct, refer to direct/general support maintenance.

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
18. MAIN MOTOR WILL NOT START.
Step 1. Check to see that main motor overload relay is on (I), and not tripped. (a) If main motor overload relay is not tripped, proceed to step 2. (b) If tripped, reset overload relay. If relay trips again, proceed to step 4. (c) If relay does not trip again and main drive motor is still inoperable, proceed to step 2.
Step 2. Check for power to main drive motor overload relay as follows: a. Turn Star-Delta switch to Y position, then to O position. b. Turn main power switch to O position. c. Remove front electronics enclosure cover. d. Remove main drive motor overload relay cover. e. Turn main power switch to I position. f. Turn Star-Delta switch to Y position, then to △ position. g. Check for 120 ± 5 V ac at input of three contacts on overload relay. (a) If voltage is correct, proceed to step 3. (b) If voltage is not present, refer to direct/general support maintenance for replacement of Star-Delta switch (paragraph 5-40.53).
Step 3. Check for 120 ± 5 V ac at output of three contacts on overload relay. (a) If voltage is not present, replace overload relay, (paragraph 5-36.3). (b) If voltage is correct, proceed to step 4.

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION

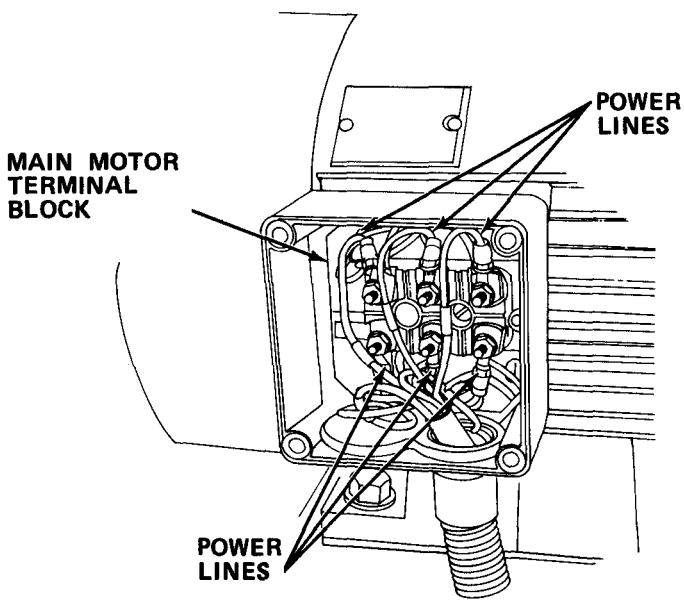
TEST OR INSPECTION

CORRECTIVE ACTION

18. MAIN MOTOR WILL NOT START - Cont

Step 4. Check resistance on main motor windings.

Remove terminal cover from motor and disconnect power lines from main drive motor terminal block. Take ohmmeter readings across terminals according to chart below, and be sure that all three readings are in range indicated below. Readings for all three phases must be equal.



THREE-PHASE MOTOR TESTS

Test Lines at Terminals	Correct Ohmmeter Readings
U and X	3-5 ohms
V and Y	3-5 ohms
W and Z	3-5 ohms

Table 5-21. ORGANIZATIONAL TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
18. MAIN MOTOR WILL NOT START - Cont
(b) If readings are incorrect, replace main drive motor (paragraph 5-36.5).
(c) If correct, replace cabling between overload relay and main drive motor.
19. BACKGAUGE DOES NOT TRAVEL ALL THE WAY FORWARD OR BACKWARD.
Step 1. Be sure that backgauge sledge cams and limit switches are positioned correctly and are not loose.
(a) If switches are out of adjustment, adjust backgauge limit switches (paragraph 5-36.17).
(b) If switches are adjusted correctly proceed to step 2.
Step 2. Check sledge guiding for proper adjustment.
(a) If out of adjustment, adjust sledge guiding, (paragraph 5-36.16).
(b) If malfunction persists, refer to direct/general support maintenance.

5-36. MAINTENANCE PROCEDURES.

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

5-36.1 Replace Main Drive Gear Clutch Pads.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
13 mm Combination Wrench
Metric Feeler Gages (0.4 - 0.8 mm)

SUPPLIES: Clutch Pads
Spacer Foils
Sandpaper Medium Grit (Item 23, Appendix E)

WARNING

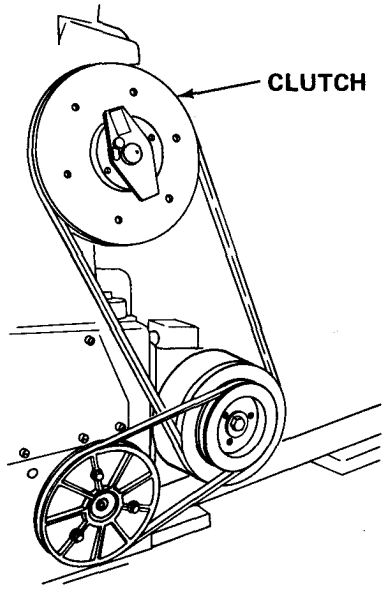
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

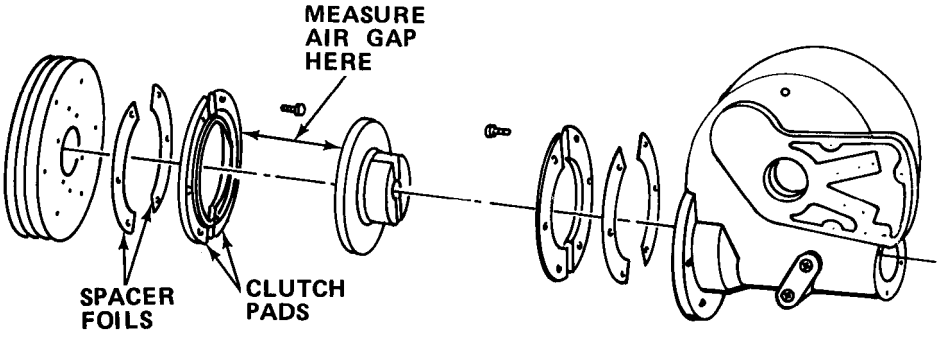
(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.



b. Remove main motor V-belt cover.



c. Remove bolts and defective clutch pads and any spacer foils.

d. Install new clutch pads and secure with bolts.

e. Check for air gap clearance of 0.4 - 0.8 mm (.016 - .031 in.).

f. If clearance is less than 0.4 mm (.016 in.), remove clutch pads and sand pad surface until proper gap is obtained when reinstalled. Repeat steps d. thru f. as necessary.

g. If clearance is more than 0.8 mm (.031 in.), remove clutch pads and add spacer foils until proper gap is obtained.

h. Reinstall main motor V-belt cover.

i. Place operator key back into safety lock.

5-36.2 Replace Main Drive Gear Clutch Brakes.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
Knife Reset Handles
13 mm Combination Wrench
Metric Feeler Gages (0.2 - 0.4 mm)

SUPPLIES: Clutch Brakes
Spacer Foils
Sandpaper Medium Grit (Item 23, Appendix E)

WARNING

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

a. Turn off power.

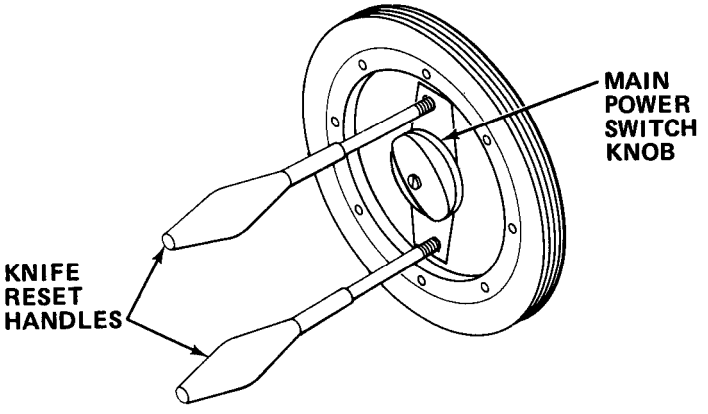
(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

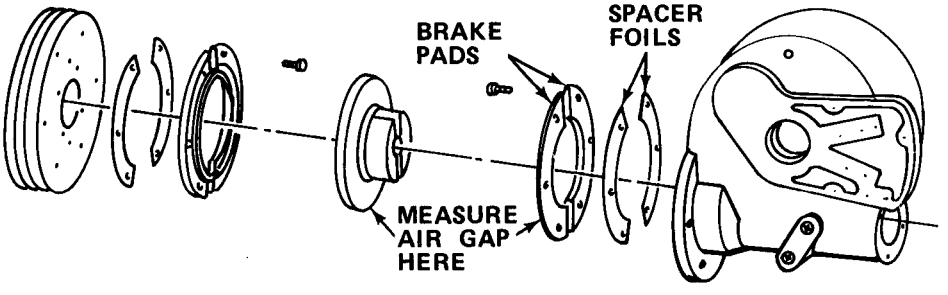
b. Remove main motor V-belt cover.

c. Remove main power switch knob.



d. Mount main power switch knob onto shaft of clutch pulley and rotate the safety plate right to open the clutch override holes.

e. Insert the reset handles into the override holes. Press the handles in while rotating the pulley until the threads engage. Then tighten the handles.



f. Remove bolts and defective brake pads and any spacer foils.

g. Install new brake pads and check air gap for clearance of 0.2 - 0.4 mm (.008 - .016 in.).

h. If clearance is less than 0.2 mm (.008 in.), then remove brake pads and sand pad surface until proper gap is obtained. Repeat steps g. and h. as necessary.

i. If clearance is more than 0.4 mm (.016 in.), remove brake pads and add spacer foils until proper gap is obtained.

j. Remove the reset handles.

k. Rotate the safety plate left and cover the override holes.

l. Remove main power knob and reinstall onto main power switch.

m. Reinstall main motor V-belt cover.

n. Place operator key back into safety lock.

5-36.3 Replace Main Drive Motor Overload Relay

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
No. 2 Cross Tip Screwdriver

SUPPLIES: Overload Relay

WARNING

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

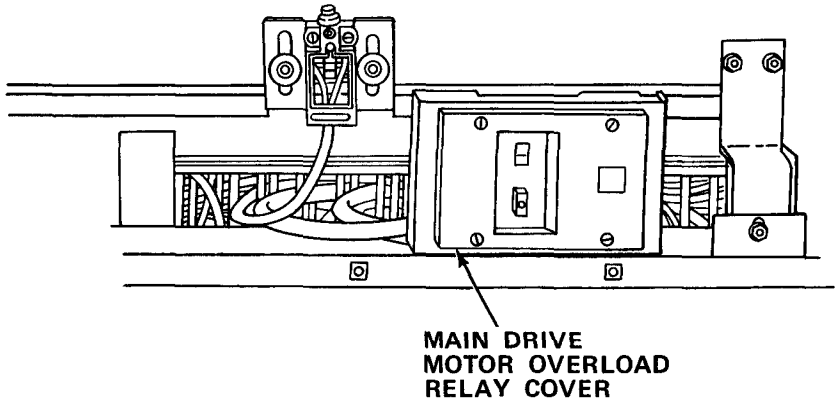
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove front electronics enclosure cover.



c. Remove screws and main drive motor overload relay cover.

d. Insert flat tip screwdriver into snap release holes, and unsnap plastic cover.

e. Loosen and remove retaining screw clamps. Then remove defective relay.

f. Tag and disconnect wiring from relay.

g. Remove defective relay from plastic frame by pressing in on tabs.

h. Reconnect wiring onto new relay.

i. Insert new relay into frame and press down until both tabs snap.

j. Reinstall plastic frame into mounting frame and secure with screw clamps.

k. Reinstall plastic cover over relay.

l. Reinstall overload relay cover and retain with screws.

m. Reinstall front electronics enclosure cover.

n. Place operator key back into safety lock.

5-36.4 Replace Main Drive Motor V-Belts.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
19 mm Combination Wrench

SUPPLIES: V-Belts

WARNING

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

NOTE

Always replace both V-belts when replacing either belt.

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

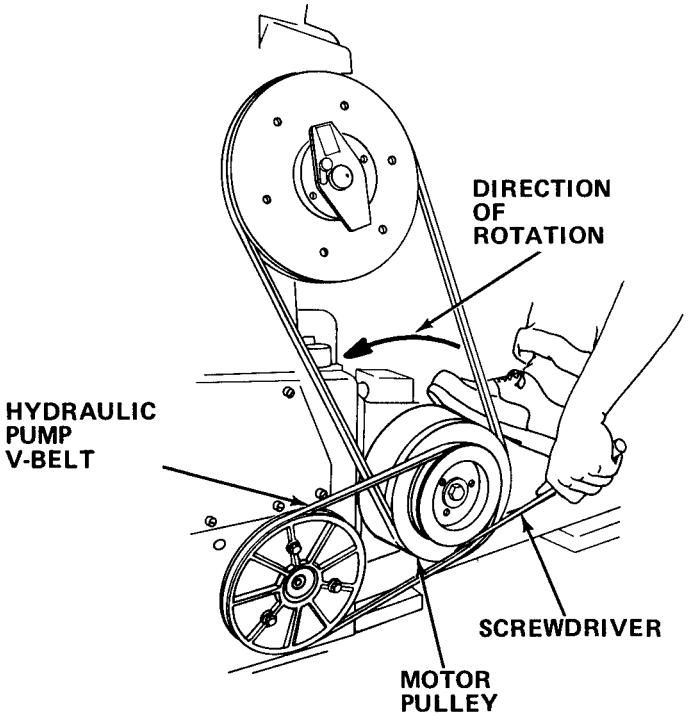
(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove main motor V-belt cover.

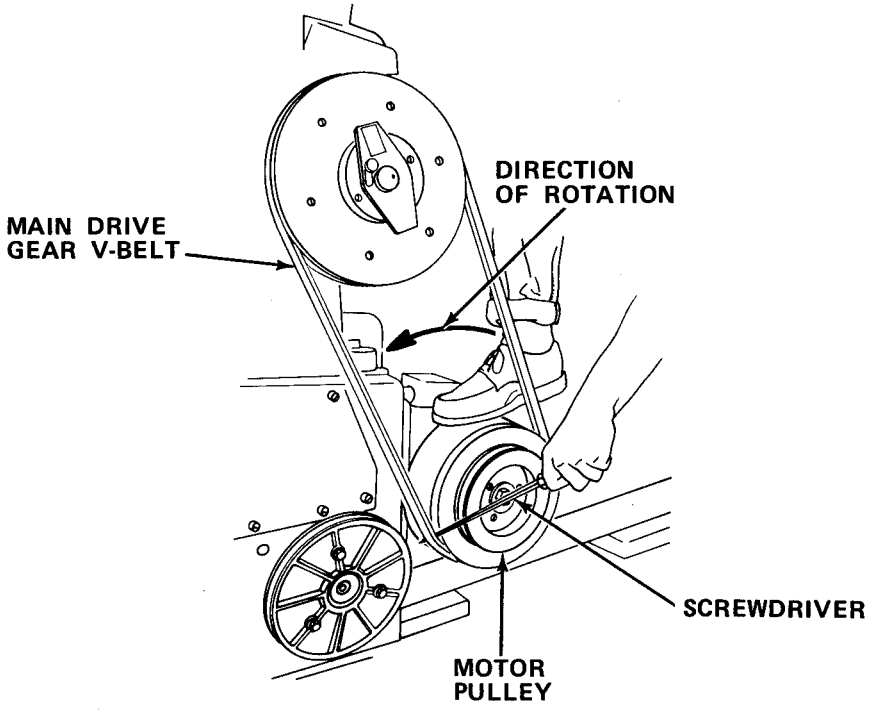
c. Remove inner V-belt cover.

d. Standing behind motor, place screwdriver under motor pulley between pulley and hydraulic pump V-belt.



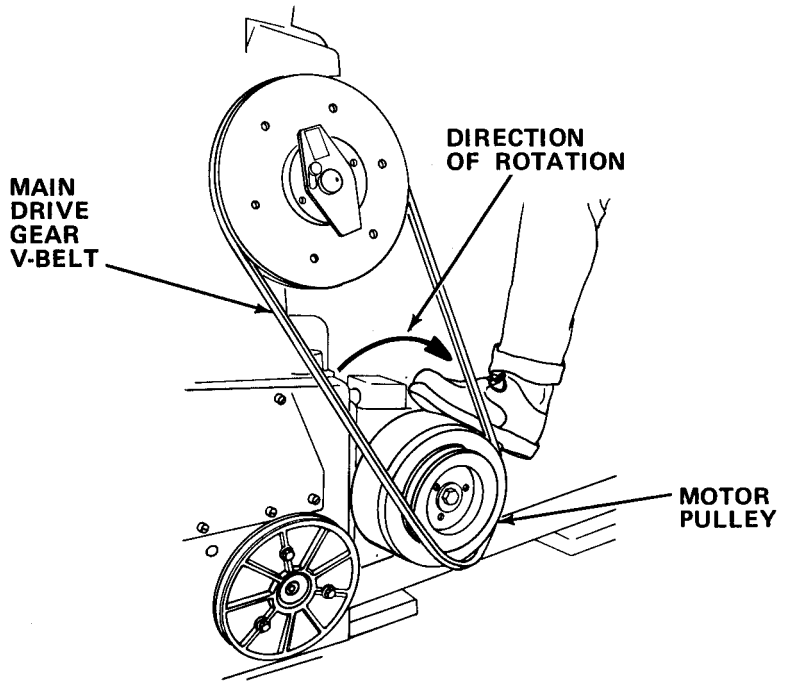
e. Place foot on top of motor pulley and rotate pulley forward until V-belt is free.

f. Place screwdriver between main drive gear V-belt and bottom of pulley.



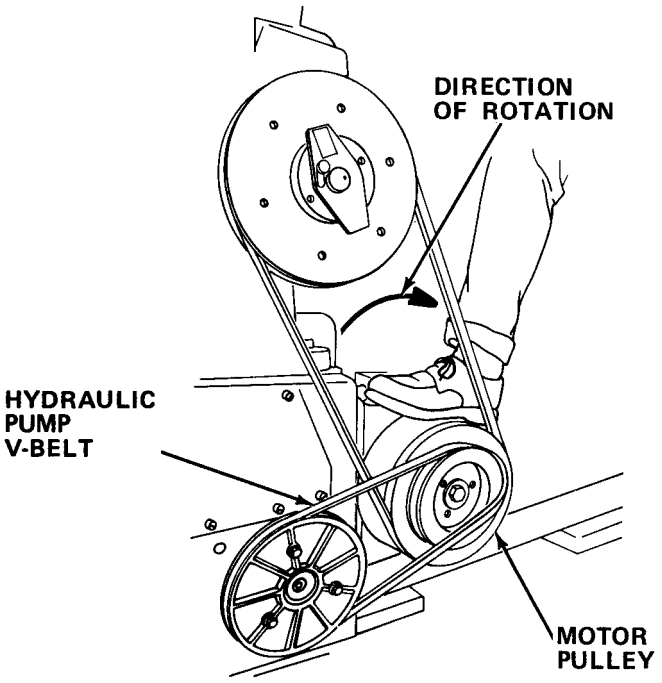
g. Place foot on top of motor pulley and rotate pulley forward until V-belt is free.

h. Place new main drive gear V-belt over clutch pulley and as far as possible over inside motor pulley.



i. Place foot on top of motor pulley and rotate back until V-belt is on pulley.

j. Place new hydraulic pump V-belt over pump pulley and as far as possible over outside motor pulley.

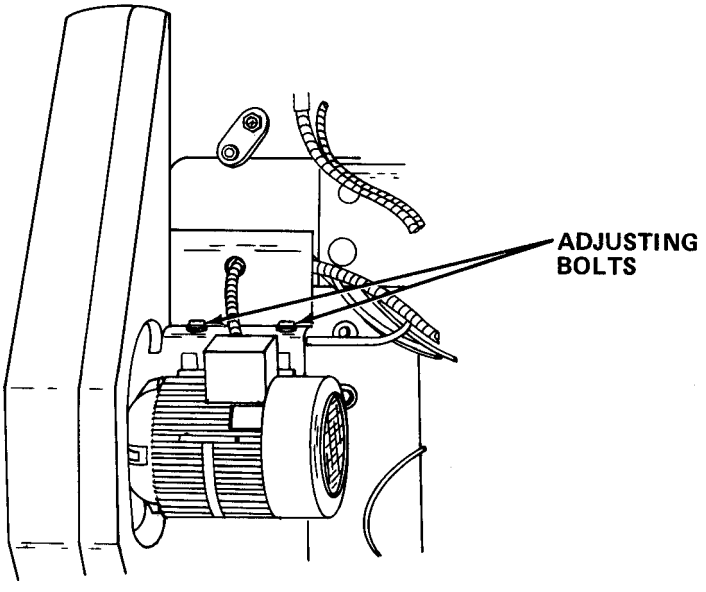


k. Place foot on top of motor pulley and rotate back until V-belt is on pulley.

l. Using modest finger pressure, press down on main gear drive V-belt and verify belt moves down only 10 mm (.39 in.).

m. If correct, proceed to step r.

n. If incorrect, adjust tension.



o. Loosen locknuts on underside of motor adjusting mount.

NOTE

Turning bolts right tightens belt.

p. Turn adjusting bolts until proper tension is obtained. Be sure to turn both bolts the same amount each time.

q. Tighten locknuts on underside of motor adjusting mount.

r. Reinstall inner V-belt cover.

s. Reinstall main drive V-belt cover.

t. Place operator key back into safety lock.

5-36.5 Replace Main Drive Motor.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
19 mm Combination Wrench

SUPPLIES: Main Drive Motor

WARNING

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

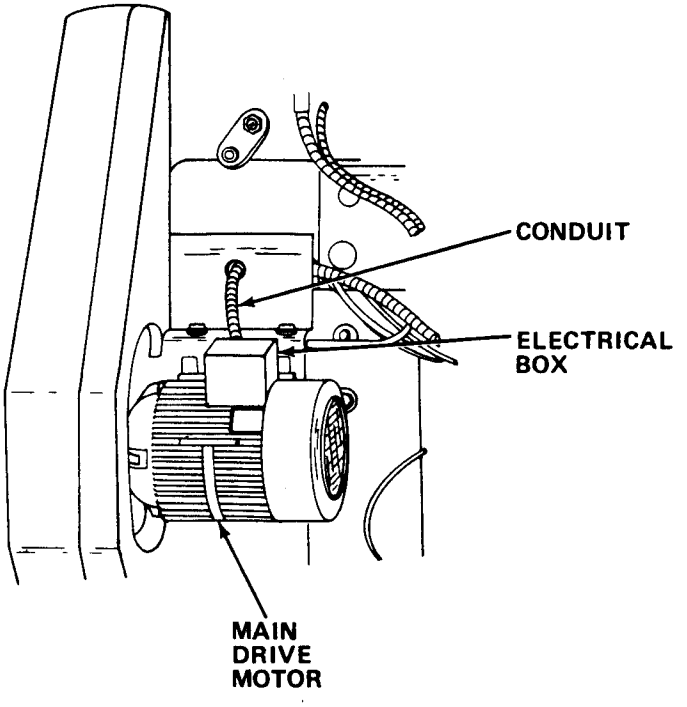
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Perform steps b. through g. of paragraph 5-36.4 to remove V-belts.



c. Remove electrical box cover on motor and tag and disconnect wiring.

d. Remove conduit connector and conduit from electrical box on motor.

e. Place blocks of wood under motor as close as possible to motor's height.

f. Remove mounting bolts and defective motor.

g. Install new motor and secure in place with mounting bolts.

h. Reinstall conduit and conduit connector to electrical box on new motor.

i. Reconnect wiring to new motor.

j. Perform steps h. through t. of paragraph 5-36.4 to reinstall V-belts.

5-36.6 Replace Backgauge Motor V-Belts.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
17 mm Socket with 3/8 in. Drive
3/8 i-n. Drive Ratchet
6 mm Hex Head Key Wrench

SUPPLIES: V-Belts

WARNING

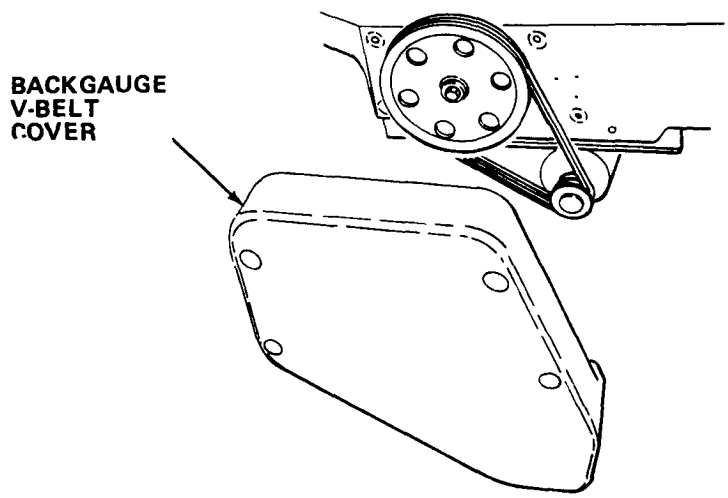
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

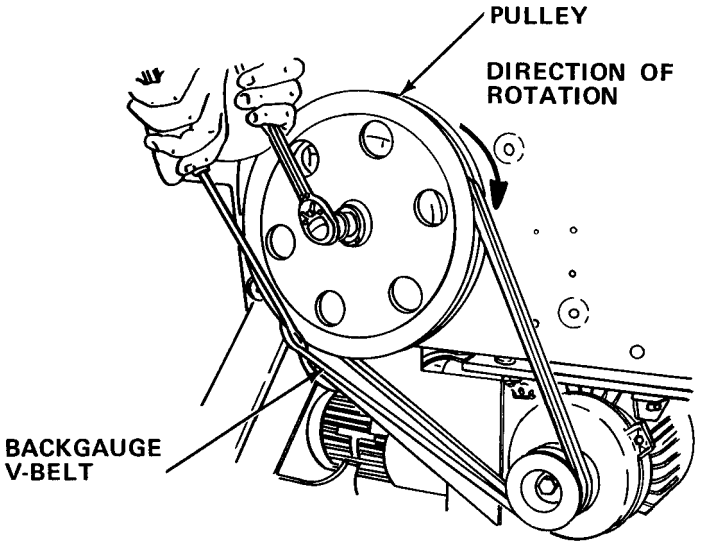
(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.



b. Remove backgauge V-belt cover.

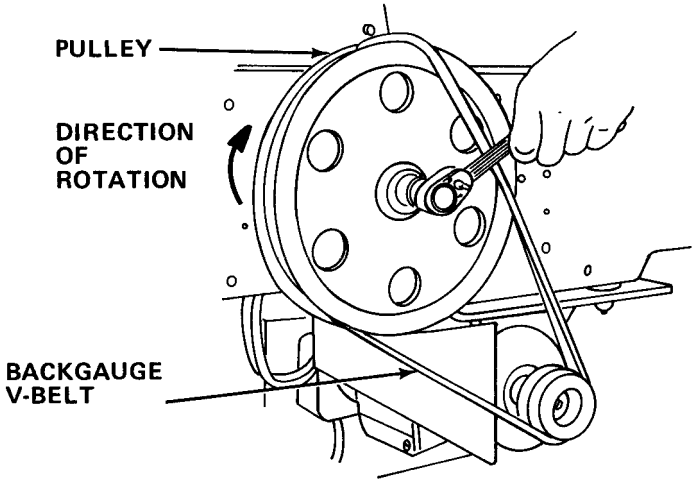
c. Place socket and ratchet on spindle's pulley nut. Place screwdriver under V-belt and pulley.



d. Rotate pulley to the right until V-belt is free.

e. Repeat above steps for second V-belt.

f. Install new V-belt on motor pulley and as much as possible on bottom of spindle pulley.



g. With ratchet and socket, rotate pulley to the right until V-belt is on.

h. Repeat steps f. and g. for remaining V-belt.

i. Reinstall backgauge V-belt cover.

j. Place operator key back into safety lock.

5-36.7 Replace Backgauge Motor.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
6 mm Hex Head Key Wrench
17 mm Combination Wrench
19 mm Combination Wrench
24 mm Combination Wrench
10 mm Combination Wrench

SUPPLIES: Backgauge Motor

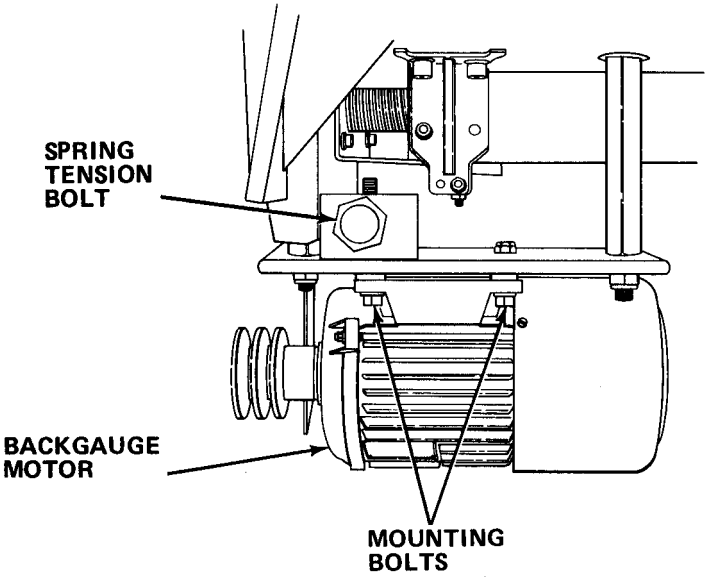
WARNING

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

a. Perform steps a. through f. of paragraph 5-40.37 and remove the backgauge brake.

b. Remove backgauge motor V-belt cover.

c. Tag and disconnect backgauge motor wiring.



NOTE

Record the number of turns on spring tension bolt that are required to loosen motor. The same number is required to tighten bolt.

d. Loosen the spring tension bolt until motor can be moved.

e. Pushing the motor in against the spring as far as possible, tighten the front plate mounting bolt so that the belt tension is removed.

f. Remove the V-belts.

g. Remove mounting bolts and defective motor.

h. Remove pulley and key from defective motor and reinstall on new motor.

i. Install new motor and secure with mounting bolts.

j. Reinstall the V-belts.

k. Firmly hold the motor in place and loosen the front mounting plate bolt. Then allow the spring tension to seat the motor in place.

l. Tighten spring tension bolt the same number of turns recorded in step d.

m. Reconnect the backgauge motor wiring.

n. Reinstall the backgauge motor V-belt cover.

o. Perform steps g. through r. of paragraph 5-40.37 to reinstall the backgauge brake.

5-36.8 Replace Backgauge Overload Relay

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: No. 2 Cross Tip Screwdriver
Flat Tip Screwdriver

SUPPLIES: Overload Relay

WARNING

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

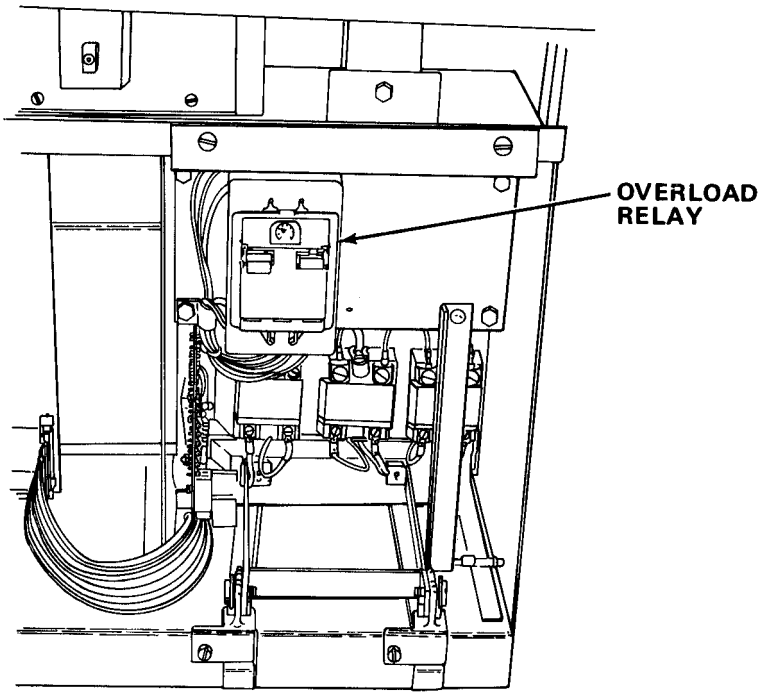
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove front electronics enclosure cover.



c. Pull plastic cover from overload relay.

d. Tag and disconnect wiring.

e. Remove mounting screws and defective overload relay.

f. Install new overload relay and secure with mounting screws.

g. Reconnect wiring.

h. Reinstall plastic cover over overload relay.

i. Reinstall front electronics enclosure cover.

j. Place operator key back into safety lock.

5-36.9 Replace Clamp Foot Pedal.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 13 mm Combination Wrench
5 mm Hex Head Key Wrench

SUPPLIES: Clamp Foot Pedal

WARNING

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

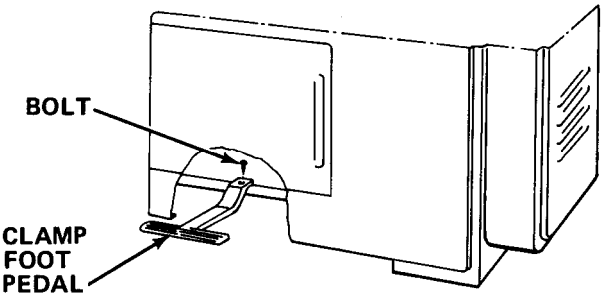
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove rear electronics enclosure cover.



c. Remove retaining bolt and wedge on rear of clamp foot pedal, and then remove defective clamp foot pedal from the front side of the cutter.

d. Insert new clamp foot pedal from the front side, and secure with retaining bolt and wedge.

e. Reinstall rear electronics enclosure cover.

f. Place operator key back into safety lock.

g. Perform clamp foot pedal adjustments (paragraph 5-36.18).

5-36.10 Replace Clamp Return Spring.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 24 mm Combination Wrench
17 mm Combination Wrench
5 mm Hex Head Key Wrench
10 in. Adjustable Wrench
Snap Ring Pliers

SUPPLIES: Return Spring

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

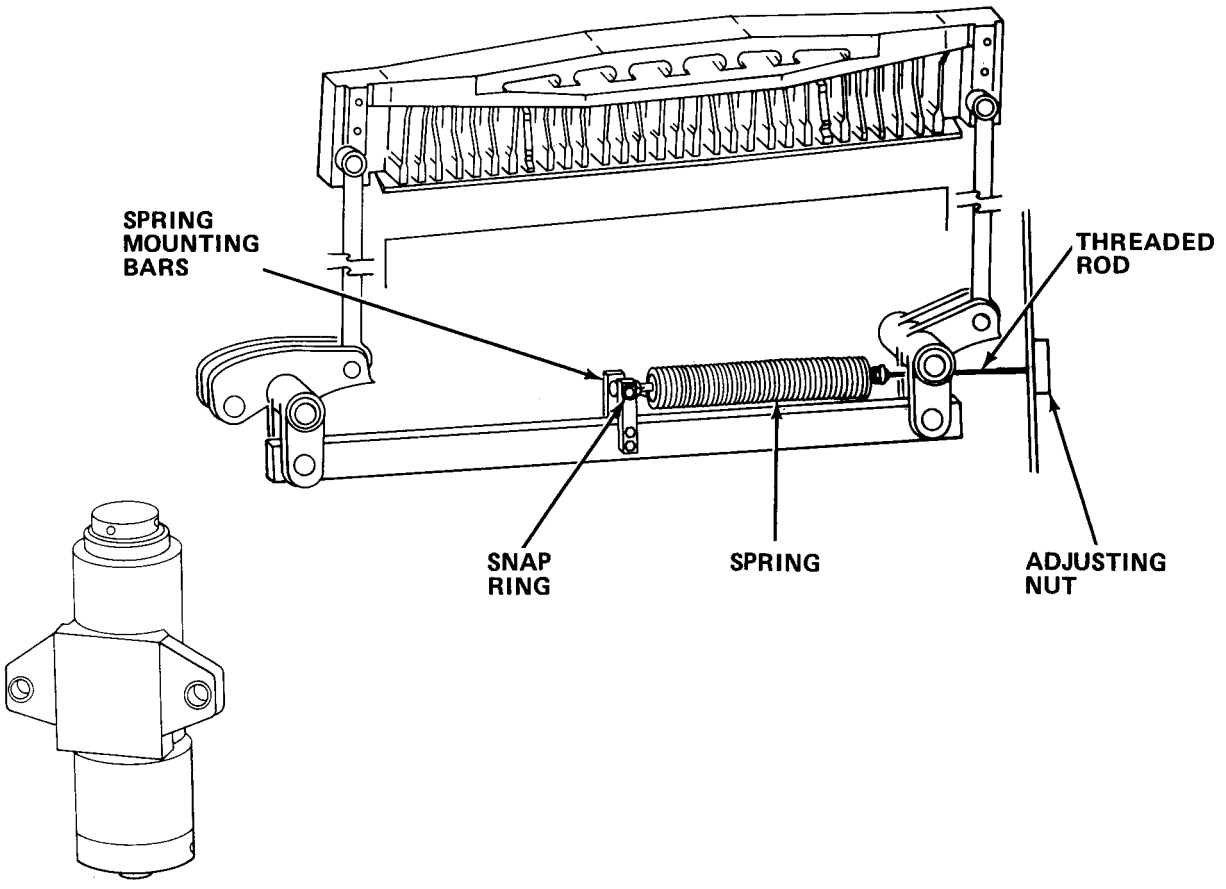
(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove rear electronics enclosure cover.

NOTE

Be sure to record the number of turns the adjusting nut is rotated. The same number of turns are required to reinstall adjusting nut properly.



c. Loosen the return spring fully by rotating adjusting nut to the left.

d. Remove snap ring from spring shaft retaining pin.

e. Remove spring mounting bars and defective spring with attached hardware from push bar.

f. Unscrew defective spring from threaded rod.

g. Screw new spring onto threaded rod.

h. Reinstall spring mounting bars to push rod and secure with retaining pin and snap ring.

i. Reinstall spring mounting bars, spring and attached hardware onto push bar.

j. Thread the other end of spring to the adjusting rod.

k. Rotate adjusting nut to the right the same number of turns it was loosened in step c.

l. Reinstall rear electronics enclosure cover.

m. Turn on power.

(1) Using operator key, unlock the safety lock.

(2) Turn main power switch to I position.

(3) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position.

(4) Press control power on switch.

n. Move the backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

o. To increase the spring tension, turn the adjusting nut to the right. This will increase the clamp return.

p. To decrease the spring tension, turn the adjusting nut to the left. This will slow down the clamp return and ease the downward action of the clamp.

q. Perform several clamping operations with foot pedal. Repeat steps o. and p. until the clamp's downward and upward motions are smooth.

r. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

5-36.11 Replace Knife.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: T-Handle Key (8 mm Hex Head Key)
Knife Carrying Handles
Knife Setting Gage
32 mm Open End Wrench (2)
41 mm Open End Wrench

SUPPLIES: Knife

a. Turn on circuit breaker.

b. Using operator key, unlock safety lock.

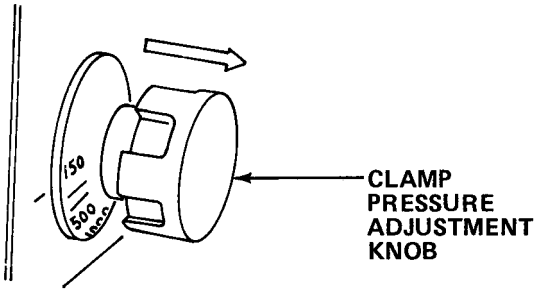
c. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

d. Move backgauge forward or backward as required until backgauge position is displayed on measurement display.



e. Pull out clamp pressure adjustment knob.

WARNING

Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.

NOTE

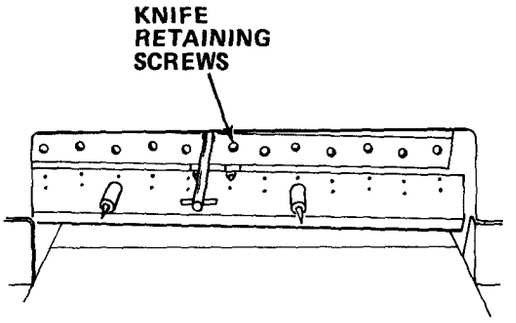
Measurement display flashes 888.88, indicating knife changing operations and backgauge operations are blocked.

f. Step on clamp foot pedal and lower clamp to approximately 3/4 inches (19 mm) above the table.

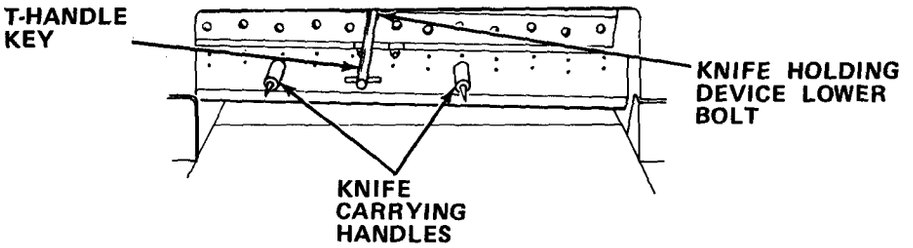
g. Pressing both cutting buttons, lower knife.

h. Remove two knife retaining screws on the left side.

i. Pressing both cutting buttons, raise knife to its upper position.



j. Remove remaining knife retaining srews.



k. Insert T-Handle key into the knife holding device lower bolt and turn right until knife is completely lowered.

WARNING

Use extreme care when handling the knife. The knife is extremely sharp and death or serious injury may occur from failure to observe this warning.

l. Screw the knife carrying handles into two bolt holds and place knife into the knife holding box.

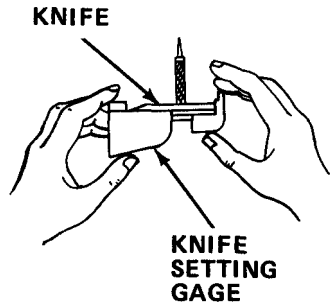
m. Turn or change the cutting stick as necessary (see paragraph 5-30.1).

WARNING

Use extreme care when handling the knife. The knife is extremely sharp and death or serious injury may occur from failure to observe this warning.

n. Using the knife carrying handles, place the new knife on a flat surface.

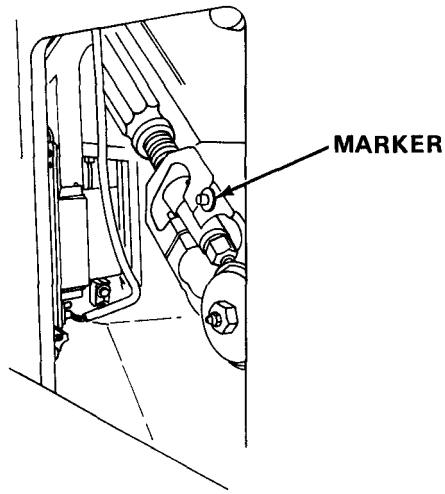
o. Insert T-Handle key into the knife holding device lower bolt and turn to the left until holding device is completely raised.



p. Using the knife setting gage, measure the width of the new knife.

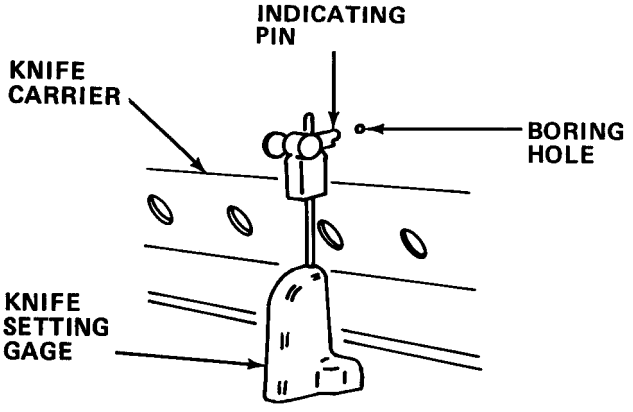
WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.



q. Remove eccentric cover. Using the cutting buttons, lower the knife carrier until the markers are alined, indicating that the knife carrier is in its lowest position.

r. Move adjusted knife setting gage to the knife carrier. If the indicating pin alines with the boring hole in the knife carrier, proceed to step v, if not, continue with step s. below.



s. Loosen locking nuts on connecting rod.

t. By turning the turnbuckle, adjust the knife carrier to position which allows the gage indicating pin to aline with the boring hole.

u. Tighten locking nuts on connecting rod.

WARNING

Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.

v. Raise the knife carrier by pressing both cutting buttons.

w. Lower the knife holding device again by using the T-Handle key.

WARNING

Use extreme care when handling the knife. The knife is extremely sharp and death or serious injury may occur from failure to observe this warning.

x. Using knife carrying handles, place knife onto the knife suspending bolts.

y. Raise the knife holding device.

z. Lower the knife by pressing both cutting buttons.

aa. Insert the knife retaining screws starting from the center to the outsides, and tighten screws with T-Handle key.

ab. Pressing the cutting buttons, raise knife.

ac. Insert one right-hand knife retaining screw and tighten.

ad. Pressing the cutting buttons, raise the knife to its upper position.

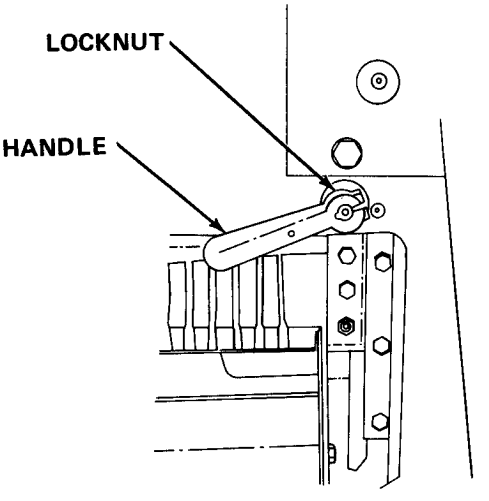
ae. Insert a sheet of paper under the knife at both ends of the knife.

af. Press down on the clamp foot pedal and hold.

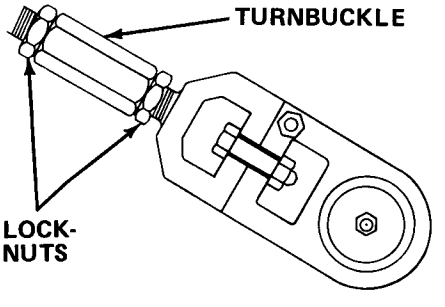
ag. Press both cutting buttons. When knife has completed its cut and reached the top, verify that both pieces of paper have been completely cut.

ah. If both pieces of paper have been completely cut, proceed to step ai. If not, perform the following:

(1) Pressing both cutting buttons, lower knife to its lowest position.



(2) Loosen locknuts on knife eccentrics and using handle, adjust the eccentrics until the knife is parallel; then tighten the locknuts.



(3) Loosen locknuts on turnbuckle and adjust turnbuckle until knife just touches the cutting stick, then tighten locknuts.

(4) Press both cutting buttons again and raise the knife.

(5) Place a sheet of paper under the knife at both ends.

(6) Press both cutting buttons and perform a cut.

(7) If both pieces of paper were not cut, loosen locknuts on turnbuckle and rotate turnbuckle 1/4 of a turn, then tighten locknuts.

(8) Repeat steps (1) through (7) until proper adjustment is obtained.

ai. Press in clamp pressure adjustment knob and step on clamp foot pedal to lower clamp fully. Then release clamp foot pedal to raise clamp.

aj. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock the safety lock.

(4) Turn off circuit breaker.

5-36.12 Replace Connecting Rod Shear Bolt.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 19 mm Combination Wrench

SUPPLIES: Shear Bolt

WARNING

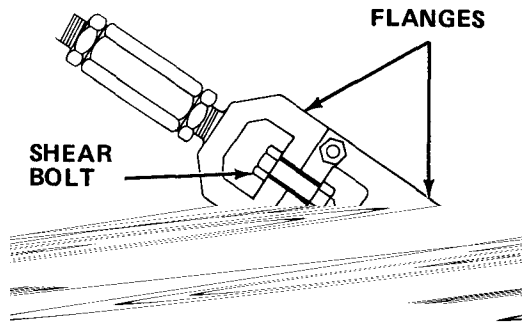
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.



b. Remove eccentric cover.

c. Remove nut and defective shear bolt.

d. Aline flanges by manually moving knife carrier (paragraph 5-36.21).

e. Remove shear bolt locking pin and reinstall on new shear bolt.

f. Install new shear bolt and secure with nut.

g. Perform manual knife carrier movements to raise knife to top dead center (paragraph 5-36.21).

h. Reinstall eccentric cover.

i. Place operator key back into safety lock.

5-36.13 Repair Table Lamp.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
10 mm Combination Wrench
Pliers

SUPPLIES: Toggle Switch
Capacitor
Butt Connectors
Ballast

WARNING

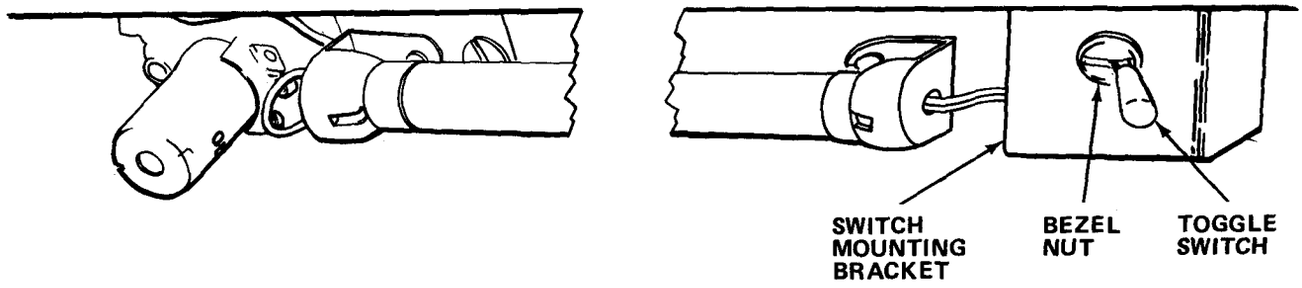
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.



b. To replace toggle switch, proceed as follows:

(1) Remove fluorescent lamp.

(2) Remove right side cable holddown.

(3) Remove retaining screws on switch mounting bracket and carefully lower switch and mounting bracket.

(4) Remove bezel nut on switch and lift defective switch from mounting bracket.

(5) Tag and disconnect wiring from defective switch.

(6) Reconnect wiring to new switch.

(7) Install new switch in mounting bracket and secure with bezel nut.

(8) Reinstall switch mounting bracket and secure with screws.

(9) Reinstall cable holddown and secure with screw.

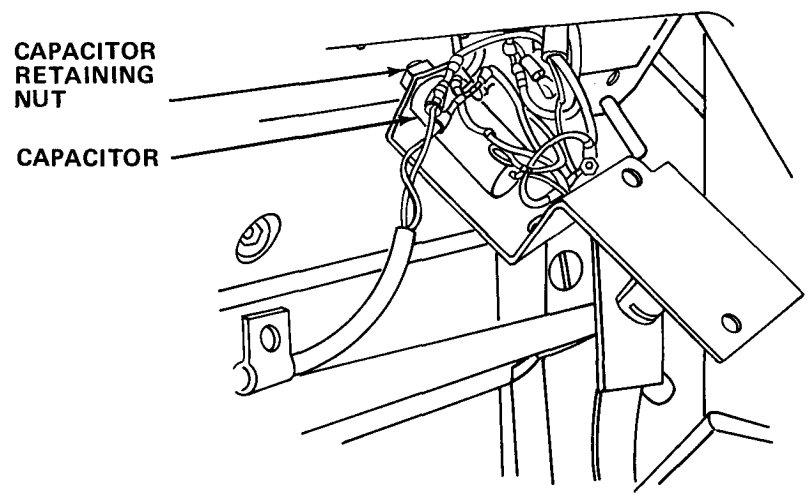
(10) Reinstall fluorescent lamp.

(11) Place operator key back into safety lock.

c. To replace capacitor, proceed as follows:

(1) Remove toggle switch. Perform steps b(1) through b(4).

(2) Tag and disconnect capacitor wires from switch.



(3) Remove capacitor retaining nut and defective capacitor.

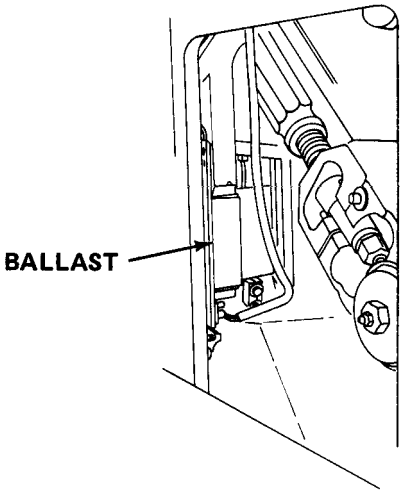
(4) Install new capacitor and secure with retaining nut.

(5) Reconnect wiring to switch.

(6) Reinstall toggle switch (steps b(7) through b(11)).

d. To replace lamp ballast, proceed as follows:

(1) Remove eccentric cover.



(2) Remove ballast mounting bolts and defective ballast.

(3) Tag and disconnect wires from defective ballast.

(4) Reconnect wires to new ballast.

(5) Install new ballast and secure with mounting bolts.

(6) Reinstall eccentric cover.

(7) Place operator key back into safety lock.

5-36.14 Adjust Main Motor V-Belt Tension.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
19 mm Combination Wrench

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

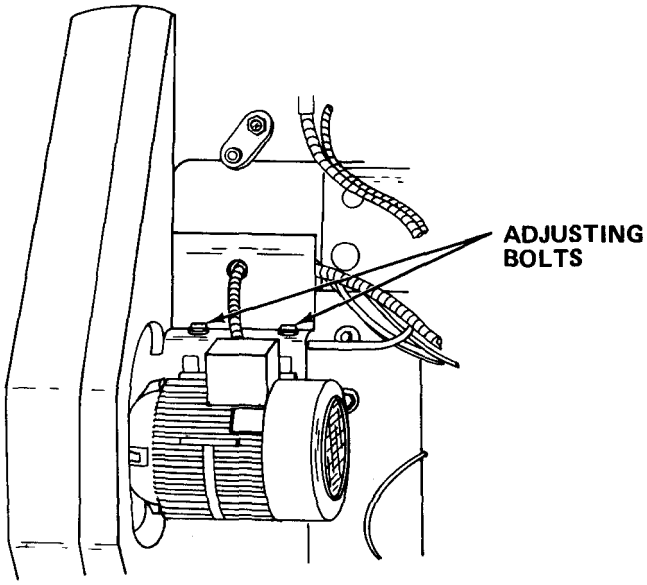
b. Remove the main drive V-belt cover.

c. Remove the inner V-belt cover.

d. Using modest finger pressure, press down on main gear drive V-belt and verify belt moves down only 10 mm (.39 in.).

e. If correct, proceed to step j.

f. If incorrect, adjust tension.



g. Loosen locknuts on underside of motor adjusting mount.

NOTE

Turning bolts right tighten belt.

h. Turn adjusting bolts until proper tension is obtained. Be sure to turn both bolts the same amount each time.

i. Tighten locknuts on underside of motor adjusting mount.

j. Reinstall inner V-belt cover.

k. Reinstall main drive V-belt cover.

l. Place operator key back into safety lock.

5-36.15 Adjust Backgauge.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 2.5 mm Hex Head Key Wrench
4 mm Hex Head Key Wrench
6 mm Hex Head Key Wrench

SUPPLIES: Ream of Paper approximately 5 cm (2 in.) in height, 76.2 cm (30 in.) in length, and 40 cm (10 in.) in width

a. Turn on circuit breaker.

b. Using operator key, unlock safety lock.

c. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta swich to Y position. After main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

d. Move backgauge forward or backward as required until backgauge position is displayed on measurement display.

WARNING

- Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.
- Always keep the largest area of the material being cut behind the knife. If the larger area is in front of the knife, it could fly up and cause serious injury.

NOTE

Ream of paper must be even on all sides.

e. Place ream of paper onto cutting table and position backgauge so that approximately 12.7 mm (1/2 in.) of paper will be cut.

f. Be sure the paper is fitted tightly against backgauge.

g. Lower clamp using clamp foot pedal.

h. Pressing both cutting buttons, cut paper.

i. Release clamp foot pedal and raise clamp.

j. Take half of cut ream (under clamp) and turn it 180°.

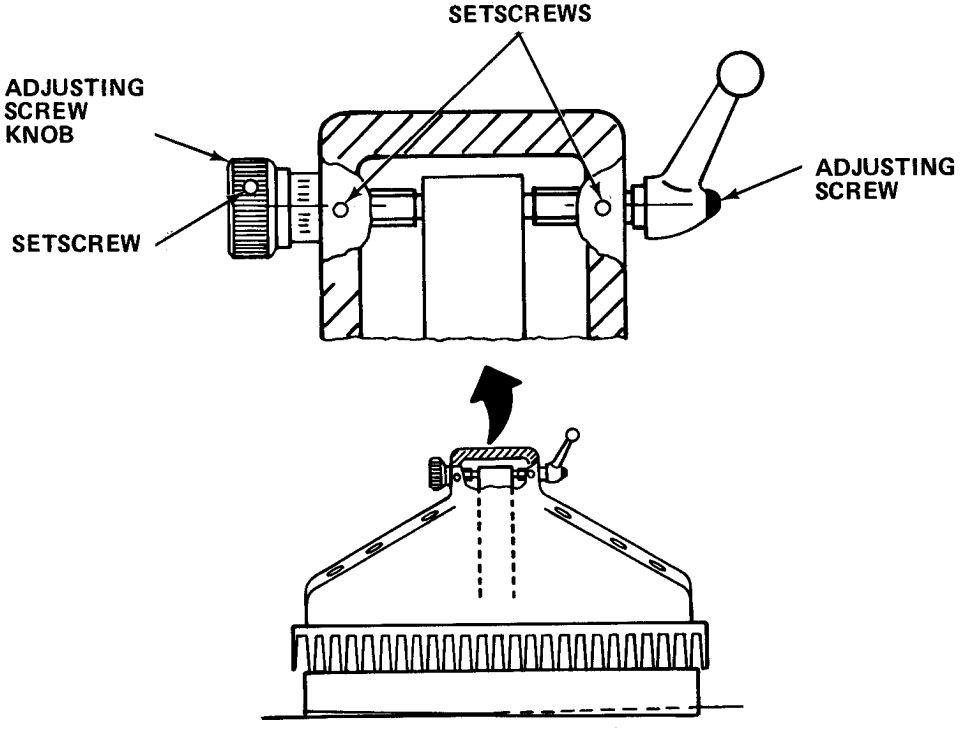
k. Place material on top of the remaining half in the machine making sure both materials are resting accurately and tightly against the backgauge.

NOTE

The side on which the lower half of the ream is wider than the top half is the side that the adjustment screw must be turned to the right. However, the opposite screw always has to be turned back the same amount.

l. Loosen set screws on adjustment screws.

m. Adjust screws as necessary.



n. Repeat steps e. - m. until properly adjusted.

o. Secure adjusting screws by tightening setscrews.

p. Loosen set screw on adjustment screw knob.

q. Rotate knob so that zero marking is alined with ▽ mark on the backgauge.

r. Tighten set screw on adjustment knob.

s. Position adjustment screw handle up to prevent it from coming in contact with back ledge of table by pulling it outward and rotating to the left.

t. Turn off power.

(1) Turn Star-Delta switch to Y postion, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock the safety lock.

u. Turn off the circuit breaker.

5-36.16 Adjust Sledge Guides.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 4 mm Hex Head Key Wrench
13 mm Combination Wrench

a. Turn on power.

(1) Using operator key, unlock safety lock.

(2) Turn main power switch to I position.

(3) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position.

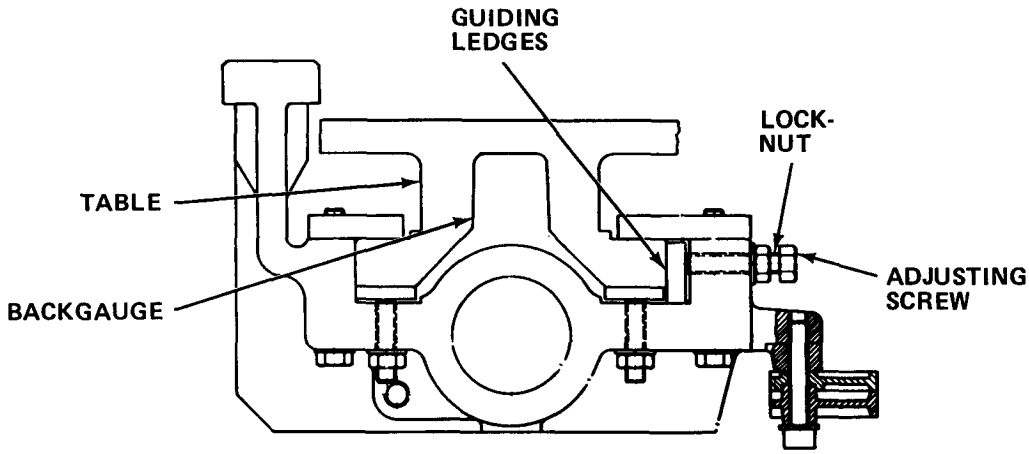
(4) Press control power on switch.

b. Move backgauge forward or backward as required until backgauge position is displayed on measurement display.

WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

c. To adjust up and down looseness, loosen locking nuts on bottom adjusting screws and adjust screws until free and easy movement without play is obtained.



d. To adjust side-to-side looseness, loosen locking nuts on side adjusting screws and adjust screws until free and easy movement without play is obtained.

e. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

5-36.17 Adjust Table Stop Bolts and Limit Switches.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS: 17 mm Combination Wrench
Flat Tip Screwdriver
6 mm Hex Head Key Wrench

SUPPLIES: None

a. Turn on circuit breaker.

b. Using operator key, unlock safety lock.

c. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

d. Move backgauge forward or backward as required until backgauge position is displayed on measurement display.

NOTE

- Be sure the measurement display is adjusted correctly (paragraph 5-40.60).
- It will be necessary to manually move the backgauge using the backgauge control knob to position the backgauge to the stops.

e. Position the backgauge to 94.50 cm (37.20 in.).

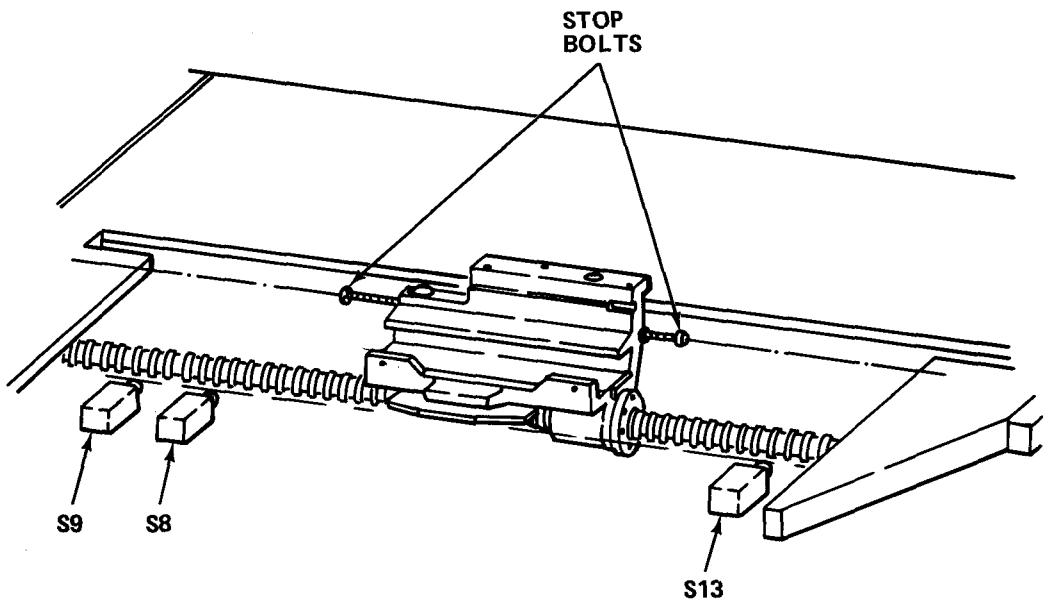
WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

f. Remove oil drip pans under the table spindle.

NOTE

It may be necessary to move the backgauge forward in order to adjust the stop bolt.



g. Loosen locknut and adjust rear stop bolt to proper setting.

h. Repeat steps e. through g. until proper adjustment is obtained.

i. Tighten locknut.

j. Position the backgauge to 1.95 cm (0.76 in).

NOTE

It may be necessary to move the backgauge back in order to adjust the stop bolt.

k. Loosen locknut and adjust front stop bolt to proper setting.

l. Repeat step j. and k. until proper adjustment is obtained.

m. Tighten locknut.

NOTE

Adjust limit switches to the following specifications:

Backward limit switch (S13)	93.50 cm (36.81 in.)
Forward limit switch with false clamp installed (S8)	8.80 cm (3.46 in.)
Forward limit switch without false clamp installed (S9)	2.40 cm (.94 in.)

n. Move the backgauge either forward or backward (depending on what switch you are adjusting) until it stops automatically. (Do not manually position backgauge.)

o. Note the position on the measurement display.

p. Move the backgauge away from the limit switch.

NOTE

It may be necessary to adjust the nylon cams to obtain proper adjustment. To adjust cams, loosen two hex head bolts. Use care to only move the cam you are adjusting.

q. Adjust the limit switch by loosening two screws at the front of the switch and move the switch in (to stop sooner) or out (to stop later).

r. Repeat steps n - q until proper adjustment is obtained.

s. Repeat steps n - r for remaining limit switches.

t. Reinstall oil drip pans.

u. Turn off power.

(1) Turn Star-Delta switch to Y position and then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock the safety lock.

(4) Turn off circuit breaker.

5-36.18 Adjust Clamp Foot Pedal.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
1-1/16 in. Combination Wrench
10 mm Socket with 1/4 in. Drive
1/4 in. Drive Ratchet
17 mm Deep Well Socket with 1/2 in. Drive
1/2 in. Drive Ratchet
Metric Feeler Gages (0.1 - 0.6 mm)
Metric Rule (158.75 mm (6.25 in.))
5 mm Hex Head Key Wrench

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

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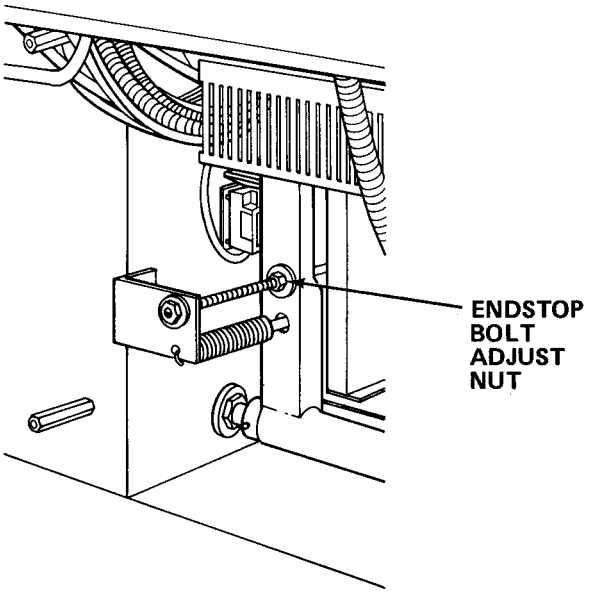
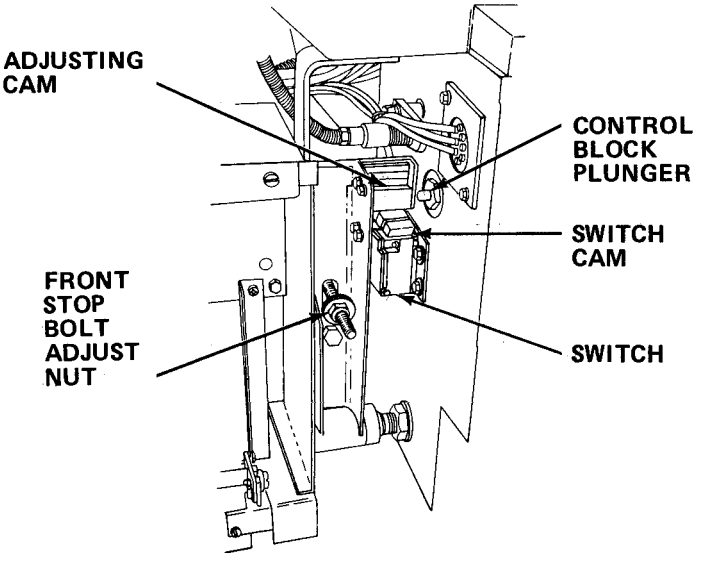
b. Remove front and rear electronics enclosure covers.



c. With the foot pedal in its uppermost position, it should not touch the frame of the electronics control unit. If it does, adjust the endstop bolt on guiding rod.



d. With the foot pedal in its uppermost position, an air gap of O.O - 0.1 mm (0.0 - .004 in.) should exist between the plunger of the control block and the adjusting cam. If not, then reposition the adjusting cam.

e. Pushing the foot pedal down to its lowest position should move the plunger in 12 mm (.47 in.). If not, then adjust the frontstop bolt on the guiding rod.

f. With the foot pedal down to its lowest position, a gap of 0.5 mm (.02 in.) should exist between the switch cam and the switch. If not, then adjust the switch as follows:

(1) Loosen two switch mounting screws and move up and down until 0.5 mm (.02 in.) clearance is obtained.

(2) Tighten mounting screws.

g. Reinstall front and rear electronics enclosure covers.

h. Place operator key back into the safety lock.

5-36.19 Adjust Clamp Return Spring.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 24 mm Combination Wrench

a. Turn on power.

(1) Using operator key, unlock the safety lock.

(2) Turn main power switch to I position.

(3) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position.

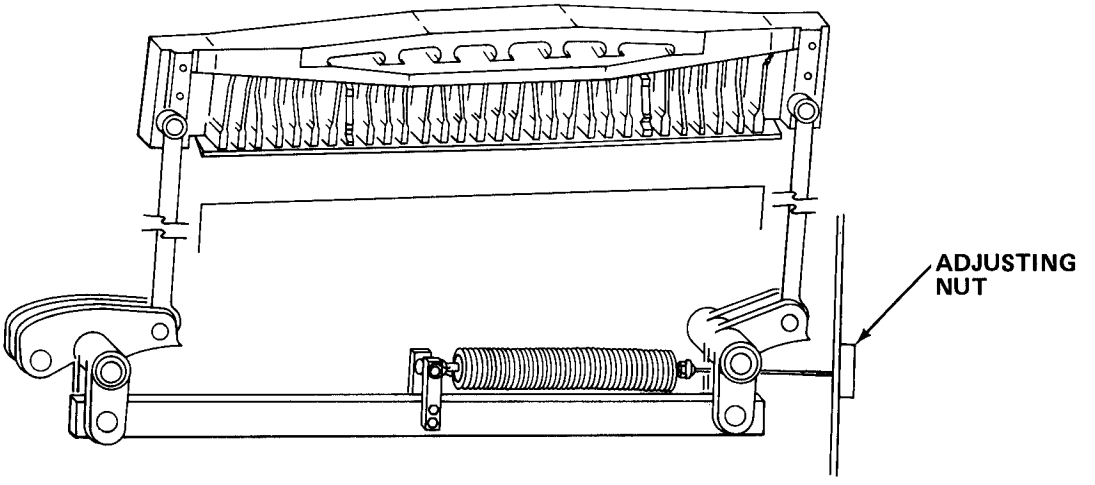
(4) Press control power on switch.

b. Move the backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

c. To increase the spring tension, turn the adjusting nut to the right. This will increase the clamp return.



d. To decrease the spring tension, turn the adjusting nut to the left. This will slow down the clamp return and ease the downward action of the clamp.

e. Perform several clamping operations with the foot pedal. Repeat steps c. and d. until the clamp's downward and upward motions are smooth.

f. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

5-36.20 Adjust Backgauge Angle.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 19 mm Open End Wrench

SUPPLIES: Paper

a. Turn on circuit breaker.

b. Using operator key, unlock safety lock.

c. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position.

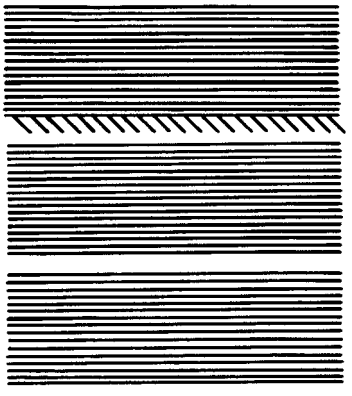
(3) Press control power on switch.

d. Move backgauge forward or backward as required until backgauge position is displayed on measurement display.

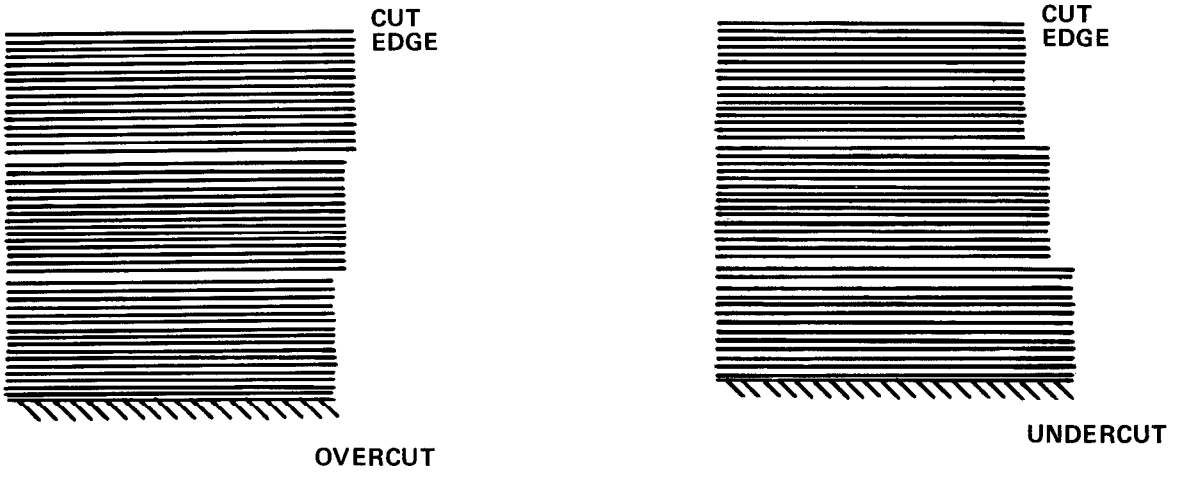
e. Place a stack of paper approximately 29-1/2 in. x 22 in. and 3 in. in height under the clamp. Position the backgauge so that 1/4 in. will be cut off the paper. Cut the paper.

f. Turn the paper 180° and again trim 1/4 in. off the stack.

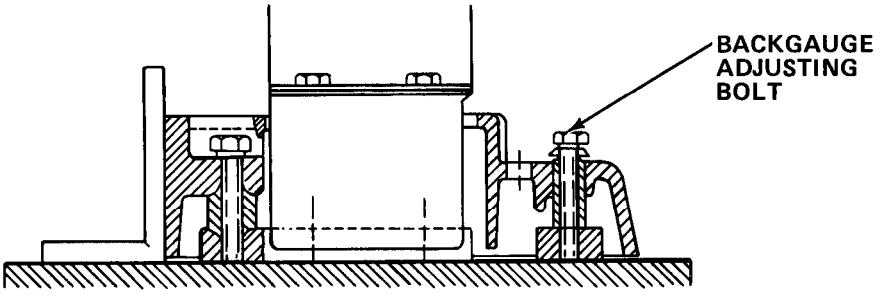
g. Jog the stack of paper tightly against the backgauge rakes. Perform another cut this time cutting off two inches of paper.



h. Remove 3/4 in. of paper from the top and bottom of the stack. Place the top of stack on the bottom and the bottom on the top.



i. Jog the paper evenly and determine if an overcut or undercut exists.



j. If an overcut exists, loosen the adjusting bolt on the backgauge; if an undercut exists, tighten the adjusting bolt.

k. Repeat steps e. through j. until problem is corrected.

l. Turn off power.

(1) Turn Star-Delta switch to Y pos ition, then to 0 position.

(2) Turn main power switch to 0 position.

(3) Using operator key, lock the safety lock.

5-36.21 Manually Move Knife Carrier.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Reset Handles
Flat Tip Screwdriver

WARNING

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

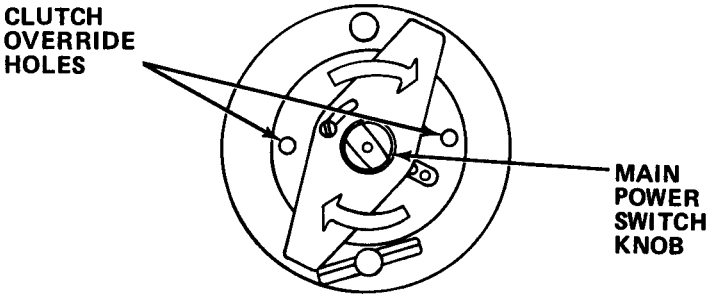
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

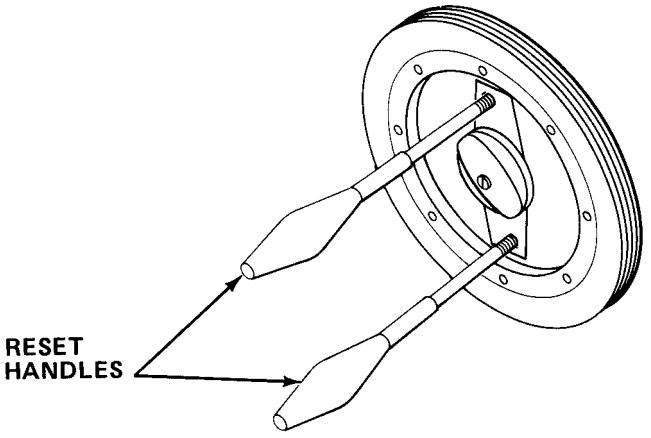
b. Remove main power switch knob.

c. Remove main drive gear clutch cover.



d. Install main power switch knob onto shaft of clutch plate.

e. Rotate knob to the right to uncover the clutch override holes.

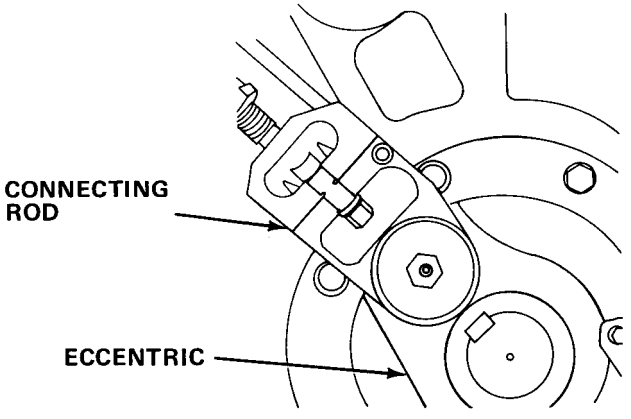


f. Insert the reset handles into the override holes and rotate to the right until the threads engage. Tighten handles.

g. Remove eccentric cover.

NOTE

- Carrier must be all the way up or cut cannot be performed.
- It may be necessary to remove the safety bolt cover and hold the safety bolt back to move the knife through all of its movement.



h. Rotate handles and main drive gear to the right until the carrier is in its uppermost position (connecting rod and eccentric are alined).

i. Remove reset handles.

j. Rotate clutch plate to the left to cover the override holes.

k. Remove main power switch knob and reinstall onto control panel.

l. Reinstall main drive gear clutch cover.

m. Reinstall eccentric cover.

5-37. PREPARATION FOR STORAGE OR SHIPMENT. Contact your battalion for packing and shipping instructions.

Section X DIRECT/GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

5-38. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

5-38.1 Common Tools and Equipment. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

5-38.2 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.

5-38.3 Repair Parts. Repair parts are listed and illustrated in the repair parts and special tools list, TM 5-3610-253-24P covering direct/general support maintenance for this equipment.

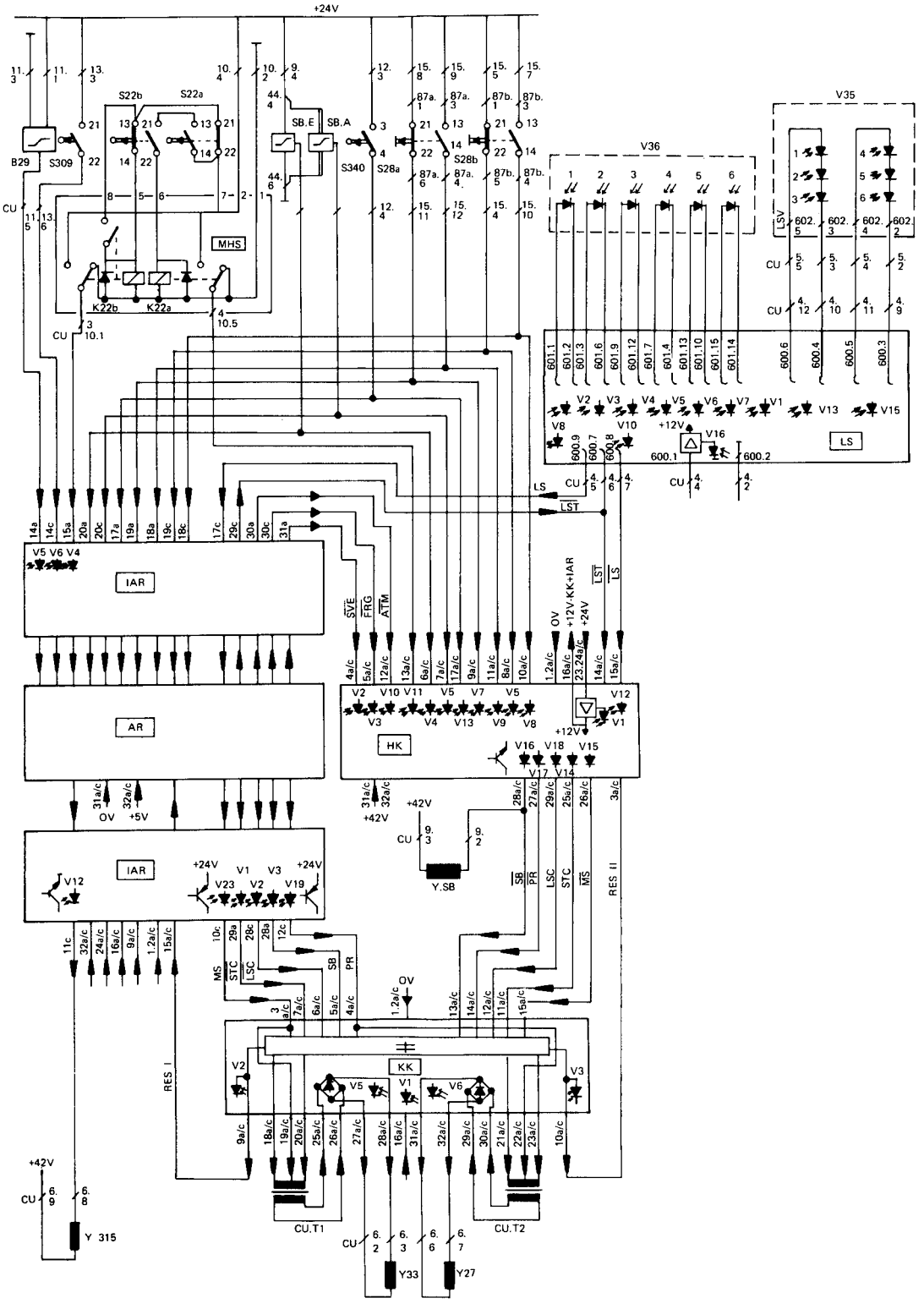
5-39. DIRECT/GENERAL SUPPORT TROUBLESHOOTING PROCEDURES.

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 the operator and organizational technician should be conducted in addition to the direct/general support trouble-shooting procedures.

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

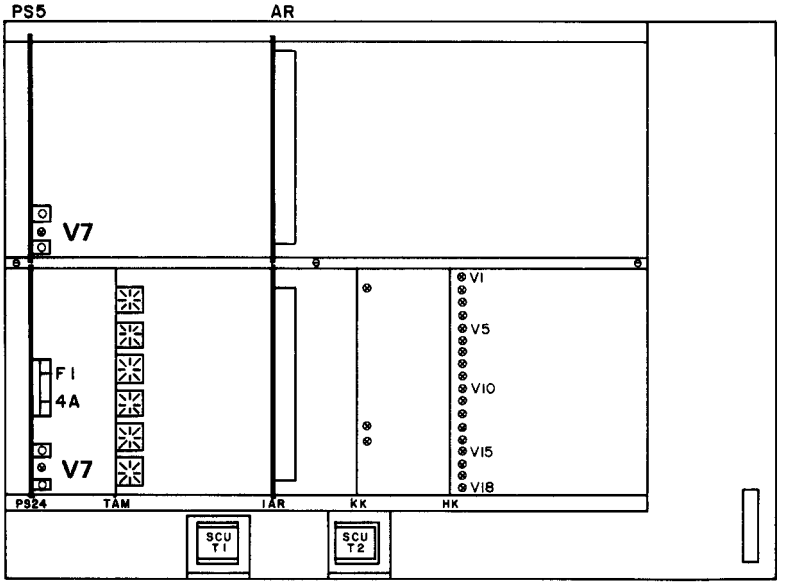
NOTE

Sufficient data is not available for you to test or troubleshoot printed circuit boards. When associated wiring, ribbon cables, power cords and other related electrical components have been eliminated as possible faults, then the printed circuit boards must be substituted, one for one, until the fault is isolated.



C. The following table lists all LED lights located in the electronics enclosure. The table is divided into two indications. The “Basic Signal” indication is the initial basic condition of light diodes after the machine is turned on. The “LED ON” indication is a statement describing what the on indication of the LED means.

Table 5-22. LED BASIC SIGNAL INDICATIONS



Card	Led	Basic Signal	Led On
PS5	V7	ON	+5.1 V existing for positioning computer
PS24	V7	ON	+24 V existing

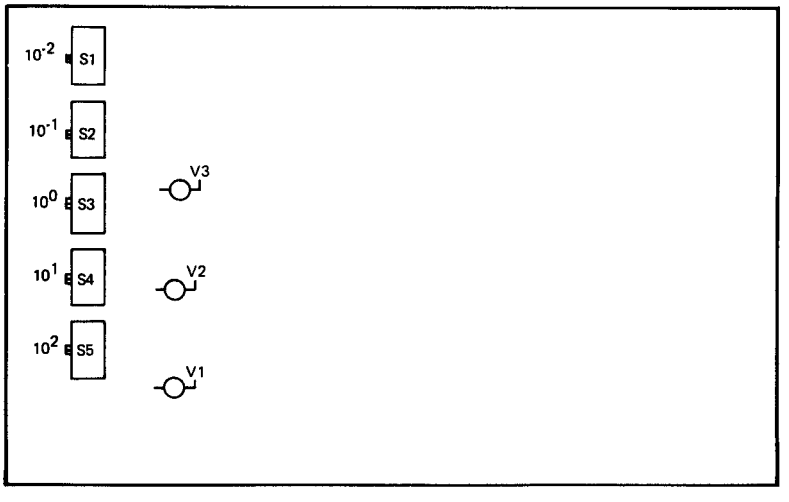
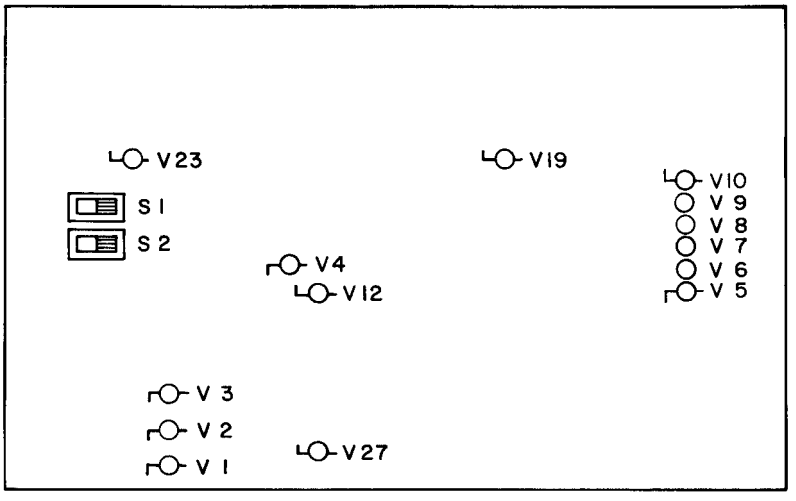


Table 5-22. LED BASIC SIGNAL INDICATIONS - Cont

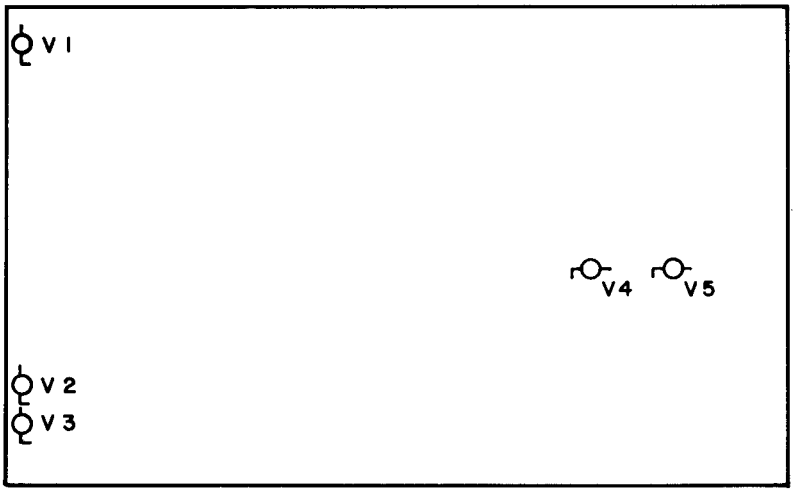
Card	Led	Basic Signal	Led On
TAM	V1	ON or OFF	Flashing during backgauge movement
	V2	ON or OFF	Counting forward
	V3	OFF	Will light up for approximately 0.5 seconds while passing reference point



IAR	V1	OFF	Cutting buttons activated within 0.5 seconds
	V2	OFF	Light barrier monitor test completed
	V3	ON	Safety bolt not activated
	V4	ON	Gear limit switch S22b tripped
	V5	ON	Clamp upper position b29 activated
	V6	OFF	Foot pedal S309 activated
	V7	OFF	Backgauge forward switch S10 engaged
	V8	OFF	Backgauge reverse switch S14 engaged
	V9	OFF	Backgauge handwheel adjustment S18 engaged
	V10	OFF	Not used

Table 5-22. LED BASIC SIGNAL INDICATIONS - Cont

Card	Led	Basic Signal	Led On
IAR - Cont			
	V12	OFF	Locking valve (M1) Solenoid Y315 activated
	V19	OFF	+24 V on transformer CU.T2 - clamping
	V23	OFF	+24 V on transformer CU.T1 - cutting
	V27	OFF	Not used



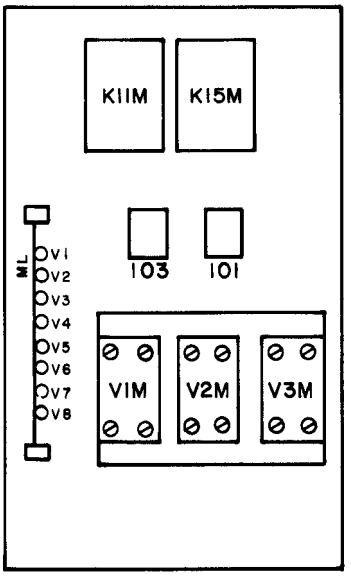
KK	V1	ON	+12 V supply voltage existing
	V2	OFF	Logic error cutting circuit - logic disagreement
	V3	OFF	Logic error cutting circuit - logic disagreement
	V4	OFF	Magnetic valve clamping (M2) Solenoid Y27 activated
	V5	OFF	Magnetic valve cutting (M1) Solenoid Y33 activated

Table 5-22. LED BASIC SIGNAL INDICATIONS - Cont

Card	Led	Basic Signal	Led On
KK - Cont			
			
HK	V1	ON	+ 12 V supply voltage existing
	V2	OFF	Retarding of cutting cycle completed
	V3	ON	if backgauge position has been displayed
(Cut cycle release)		OFF	if no backgauge position visible at the display
	V4	ON	Safety bolt in locking position - S.SBE
	V5	OFF	Safety bolt disengaged - S.SBA
	V6	ON	Cutting button left - S28a - contact normally closed
	V7	ON	Cutting button right - S28b - contact normally closed
	V8	OFF	Cutting button left - S28a - contact normally open

Table 5-22. LED BASIC SIGNAL INDICATIONS - Cont

Card	Led	Basic Signal	Led On
HK - Cont	V9	OFF	Cutting button left - S28b - contact normally open
	V10	OFF	Not Used
	V11	OFF	Knife upstroke, gear limit switch S22a activated
	V12	ON	Light barrier beams clear of obstructions
	V13	OFF	Knife inching mode S340 activated
	V14	OFF	Cutting buttons activated within 0.5 seconds
	V15	OFF	Signal for transformer CU.T2 - clamping
	V16	OFF	Safety bolt activated
	V17	OFF	Signal for transformer CU.T1 - cutting
	V18	OFF	Light barrier monitor test completed



ML	V1	OFF	Backgauge motor fast - K11M energized
	V2	OFF	Backgauge motor forward - K15M de-energized

Table 5-22. LED BASIC SIGNAL INDICATIONS - Cont

Card	Led	Basic Signal	Led On
ML - Cont			
	V3	OFF	Not used
	V4	OFF/ON	False clamp plate stored - activated -
	V5	OFF	Lifting solenoid for motorbrake on - Y17 - no brake action
	V6	ON	Table limit switch front - OFF, if tripped -
	V7	ON	Table limit switch rear S13 - OFF, if tripped -
	V8	OFF	Backgauge motor ON

SYMPTOM INDEX

SYMPTOM INDEX - Cont

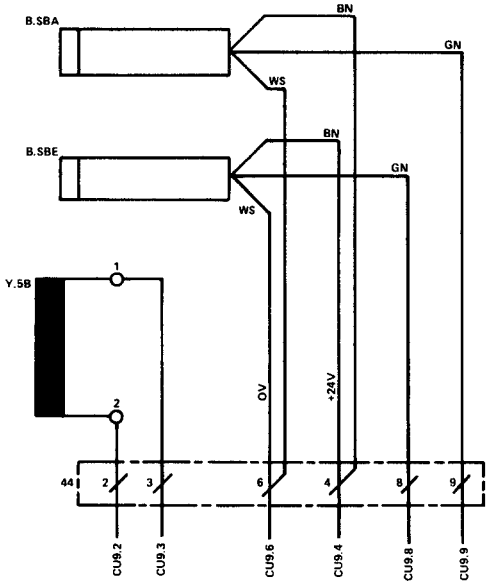
Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. ERROR MESSAGE 49.	Check output of +5.1 V.	(a) Adjust or replace circuit board PS 5 (paragraph 5-40.31). (b) If malfunction persists, refer to electrical and electronic schematics for fault isolation.
2. ERROR MESSAGE 81.	Proximity switches of safety bolt acknowledge both positions at the same time.	

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

2. ERROR MESSAGE 81 - Cont



Step 1. Check +24 V supply voltage to proximity switches at plug connector 44, ground on pin 6 and +24 V on pin 4.

(a) If voltage is missing, replace PS 24 (paragraph 5-40.31).

(b) If correct, proceed to step 2.

Step 2. Check switches for proper operation, B.SBA (rear switch) closed, B.SBE (front switch) open.

(a) Perform test of safety bolt proximity switches and replace defective parts (paragraph 5-40.3).

(b) If correct readings are obtained, proceed to step 3.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. ERROR MESSAGE 81 - Cont	Step 3. Visually check ribbon cable between circuit boards IAR and AR and check continuity on all pins.	(a) If ribbon cable is defective, replace ribbon cable (paragraph 5-40.33). (b) If ribbon cable is not defective, proceed to step 4.
	Step 4. Replace circuit board IAR (paragraph 5-40.28).	If malfunction persists, proceed to step 5.
	Step 5. Replace circuit board AR (paragraph 5-40.28).	If malfunction persists, refer to electrical and electronic schematics for fault isolation.
3. ERROR MESSAGE 82.	During activation of locking valve (M1) solenoid (Y315), control transistor on card IAR does not function.	
	Step 1. Visually check ribbon cable between circuit boards IAR and AR and check continuity of all pins.	(a) If ribbon cable is defective, replace ribbon cable (paragraph 5-40.33). (b) If ribbon cable is not defective, proceed to step 2.
	Step 2. Replace circuit board IAR (paragraph 5-40.28).	If malfunction persists, proceed to step 3.
	Step 3. Replace circuit board AR (paragraph 5-40.28).	If malfunction persists, refer to electrical and electronic schematics for fault isolation.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

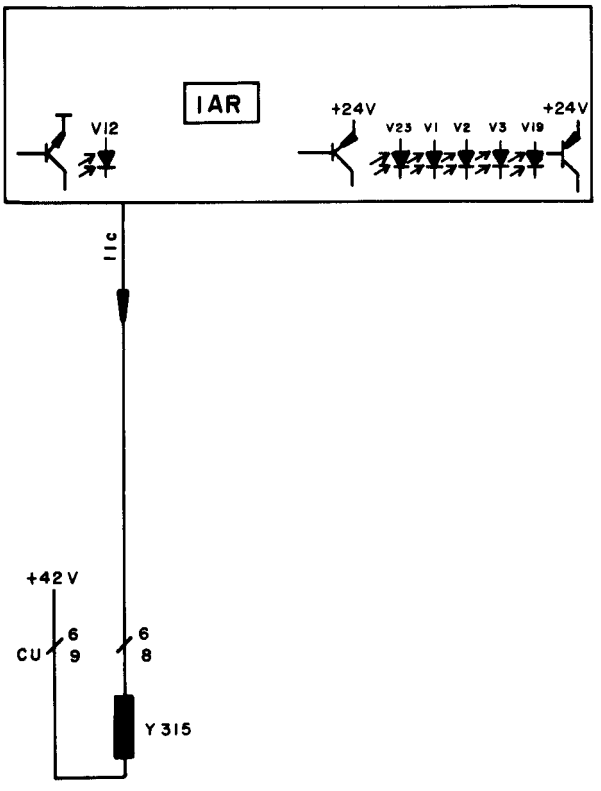
MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
4. ERROR MESSAGE 83 - Cont The light barrier does not react to the test signal before cutting cycle starts with output condition interrupted. Step 1. Check adjustment of light barrier.	(a) Perform light barrier adjustments (paragraph 5-40.62). (b) If adjustment cannot be made, replace defective part. (c) If adjustment is correct, proceed to step 2.
Step 2. Visually check ribbon cable between circuit boards IAR and AR and check continuity of all pins.	(a) If ribbon cable is defective, replace ribbon cable (paragraph 5-40.33). (b) If ribbon cable is not defective, proceed to step 3.
Step 3. Replace circuit board LS (paragraph 5-40.52).	If malfunction persists, proceed to step 4.
Step 4. Replace circuit board IAR (paragraph 5-40.28).	If malfunction persists, proceed to step 5.
Step 5. Replace circuit board AR (paragraph 5-40.28).	If malfunction persists, refer to electrical and electronic schematics for fault isolation.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

5. ERROR MESSAGE 84.

While locking valve (M1) Solenoid (Y315) is switched off, voltage of +42 V is missing on control line for locking valve.



Step 1. Check +42 V supply voltage to locking valve at connector CU 6, pin 9.

(a) If +42 V is present, proceed to step 4.

(b) If + 42 V is not present, proceed to step 2.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

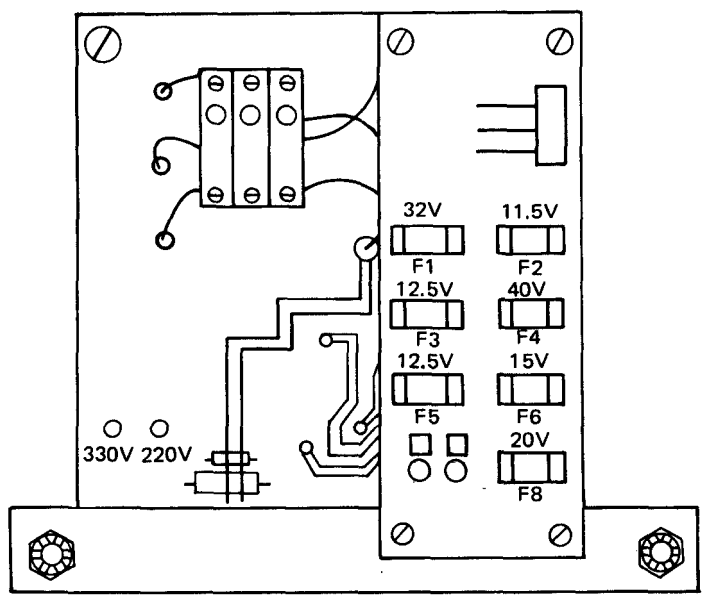
5. ERROR MESSAGE 84 - Cont

Step 2. Check for + 42 V at plug connector SCU 1, pin 9.

(a) If present, replace SCU motherboard (paragraph 5-40.34).

(b) If not, proceed to step 3.

Step 3. Check for 40 V ac at fuse F4.



(a) If 40 V ac is present, replace rectifier PM.V2 and capacitor PM.C1, (paragraph 5-40.54).

(b) If 40 V ac is not present, and fuse is not defective, replace main transformer (paragraph 5-40.54).

Step 4. Check resistance of locking valve coil for open circuit between connector CU 6, pins 8 and 9.

(a) If 45-52 ohms is not present, replace locking valve (paragraph 5-40.20).

(b) If correct resistance is obtained, proceed to step 5.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

5. ERROR MESSAGE 84 - Cont

Step 5. Visually check ribbon cable between circuit boards IAR and AR and check continuity of all pins.

(a) If ribbon cable is defective, replace ribbon cable (paragraph 5-40.33).

(b) If ribbon cable is not defective, proceed to step 6.

Step 6. Replace circuit board IAR (paragraph 5-40.28).

If malfunction persists, proceed to step 7.

Step 7. Replace circuit board AR (paragraph 5-40.28).

If malfunction persists, refer to electrical and electronic schematics for fault isolation.

6. ERROR MESSAGE 85 OR 86.

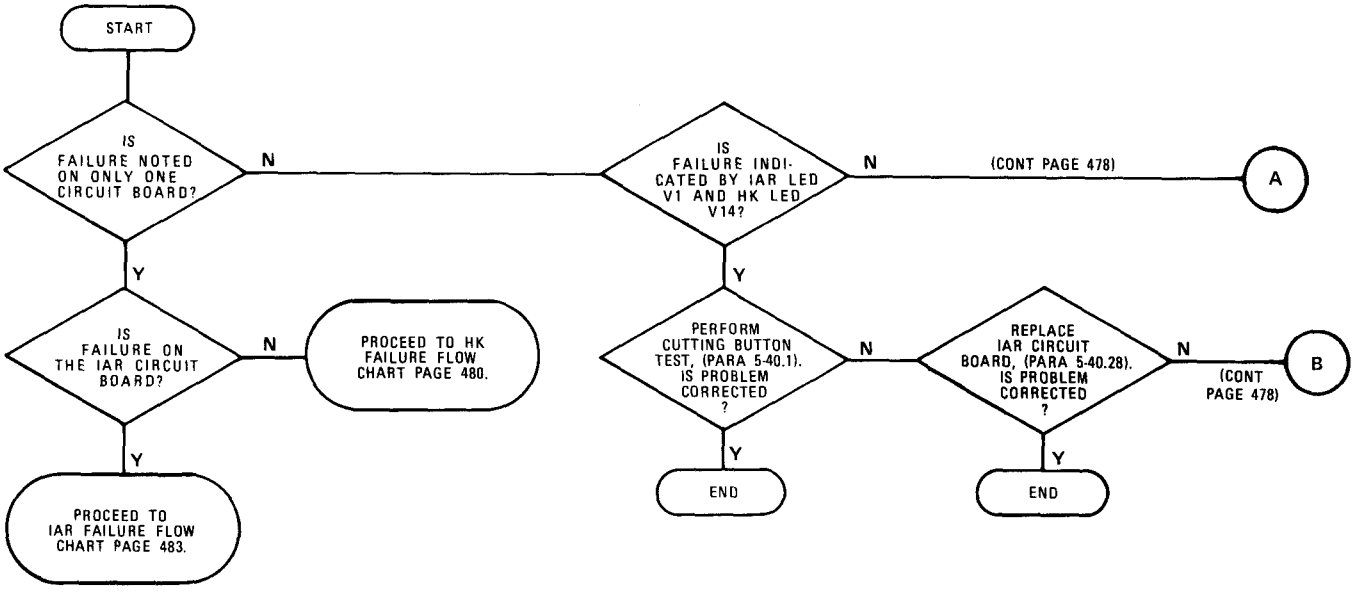
(85) During cutting cycle, control channel board (KK) registers discrepancies more than three times at logic outputs between the cutting circuit channels (board HK and AR).

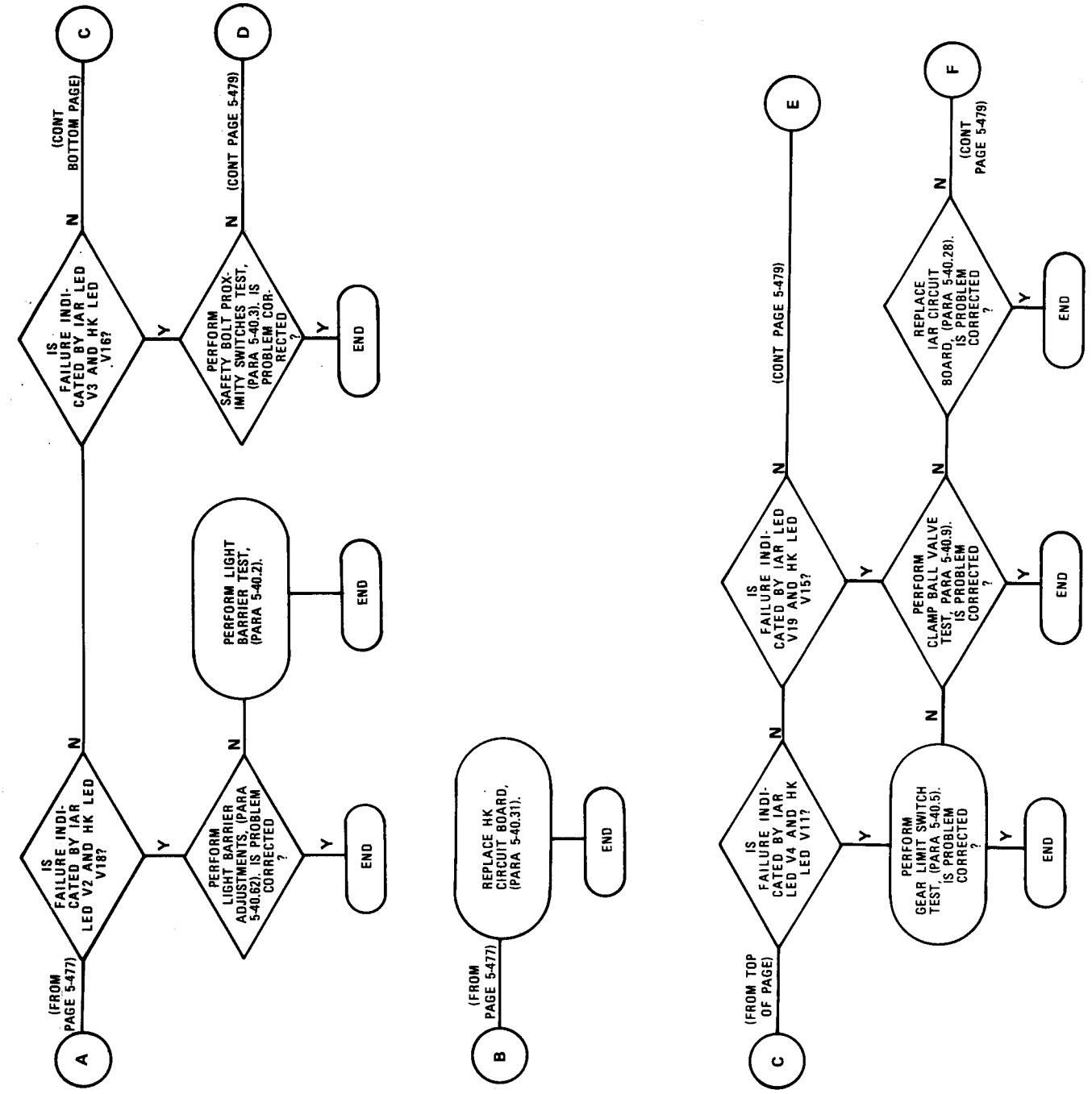
(86) Static discrepancy exists between output of both cutting circuit channels (board HK and board IAR). LED V2 and V3 on KK board are lit permanently.

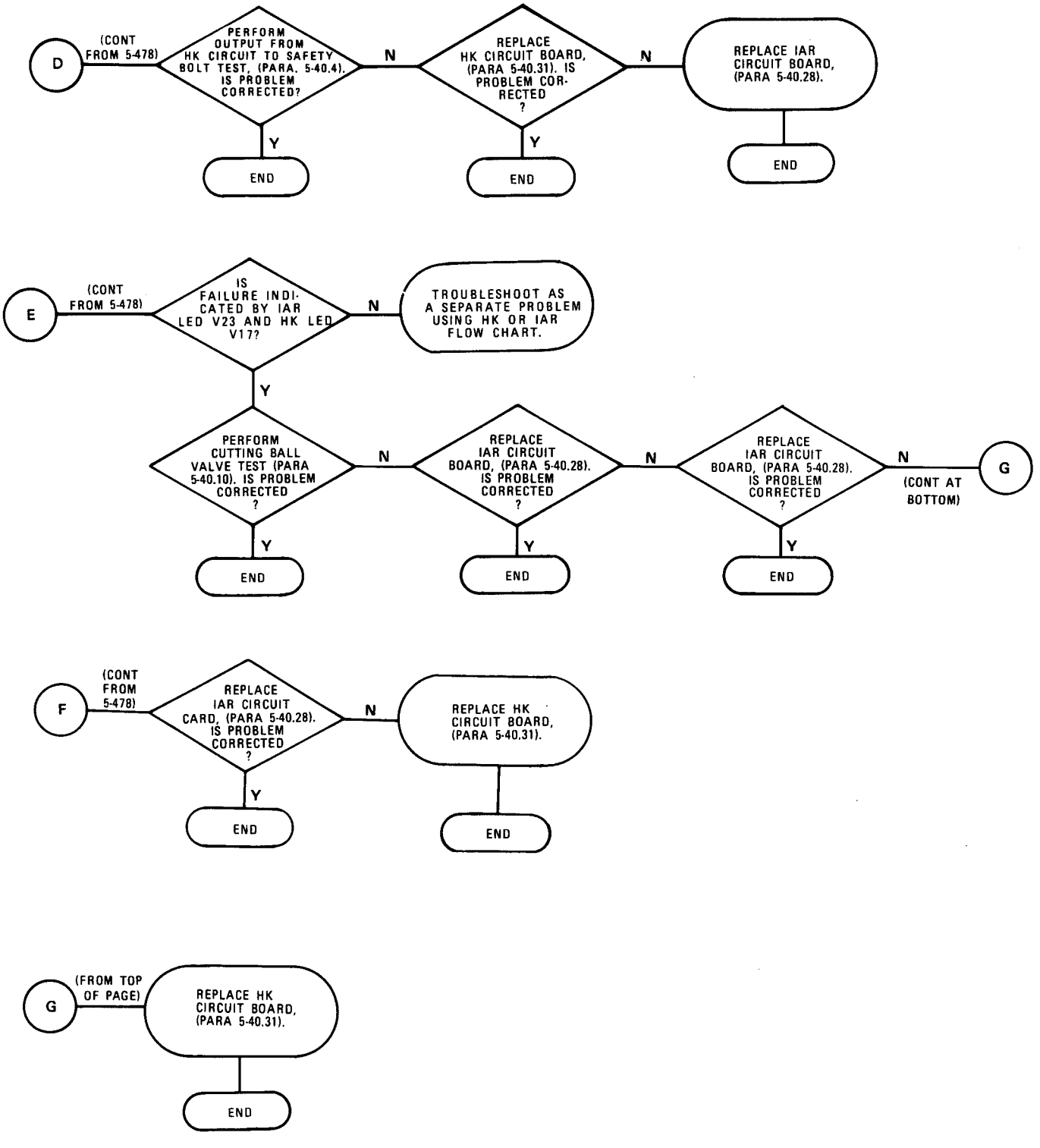
Step 1. Check basic condition of all LEDs on card HK and IAR and note all errors (Table 5-22.)

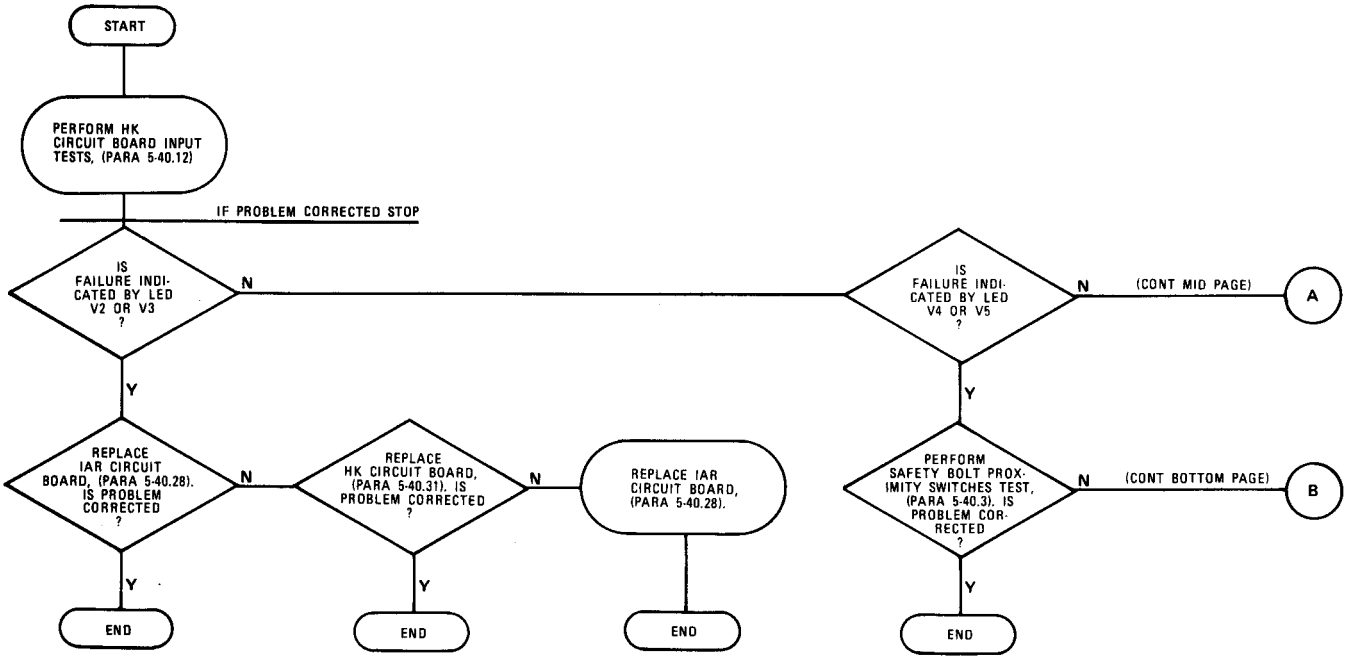
(a) Troubleshoot error in accordance with the following flow chart.

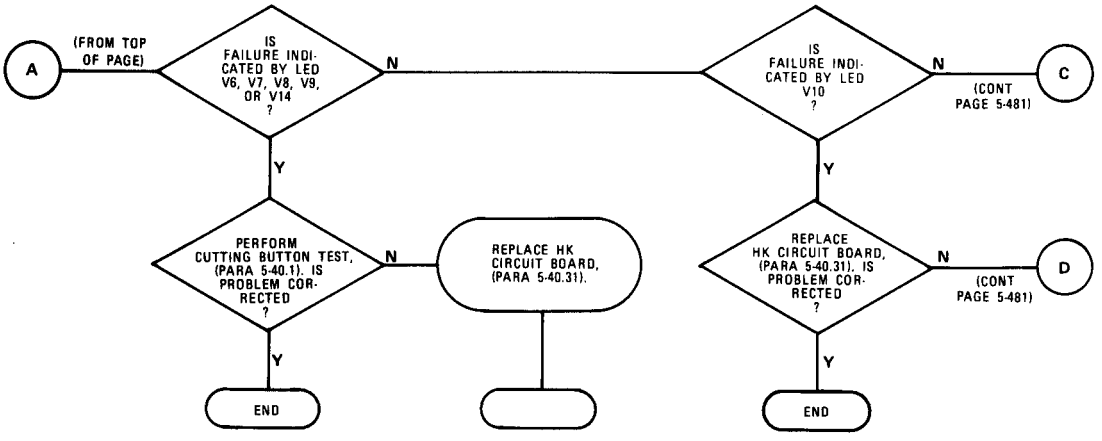
(b) If malfunction is not corrected, proceed to step 2.

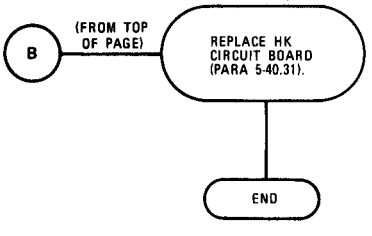

START
IS FAILURE NOTED ON ONLY ONE CIRCUIT BOARD?
N
Y
IS FAILURE ON THE IAR CIRCUIT BOARD?
N
PROCEED TO HK FAILURE FLOW CHART PAGE 480.
Y
PROCEED TO IAR FAILURE FLOW CHART PAGE 483.
IS FAILURE INDICATED BY IAR LED V1 AND HK LED V14?
N
(CONT PAGE 478)
A
Y
PERFORM CUTTING BUTTON TEST, (PARA 5-40.1). IS PROBLEM CORRECTED ?
N
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28). IS PROBLEM CORRECTED ?
N
(CONT PAGE 478)
B
Y
END
Y
END

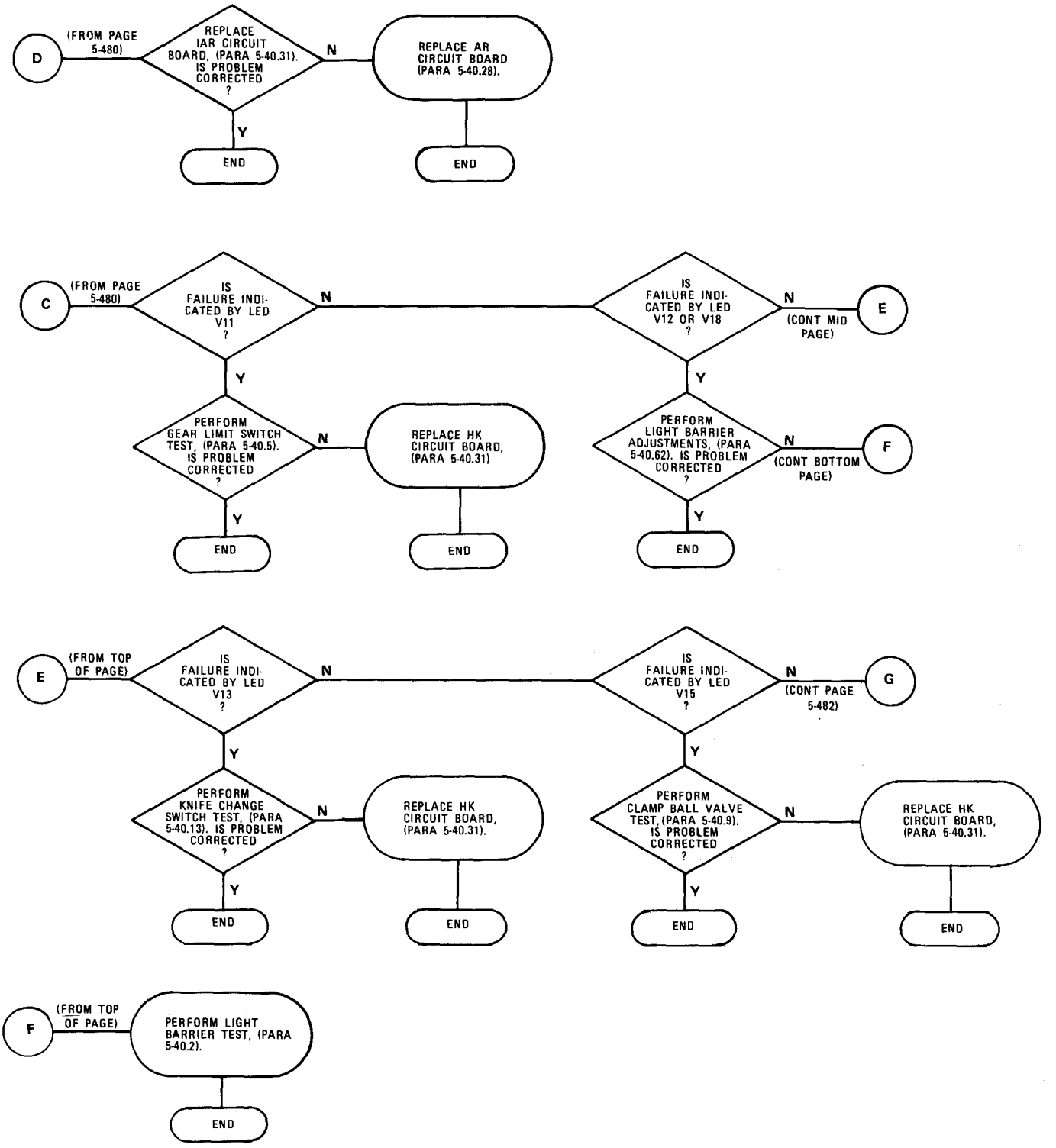

A
(FROM PAGE 5-477)
IS FAILURE INDICATED BY IAR LED V2 AND HK LED V18?
N
Y
PERFORM LIGHT BARRIER ADJUSTMENTS, (PARA 5-40.62). IS PROBLEM CORRECTED ?
N
Y
END
PERFORM LIGHT BARRIER TEST, (PARA 5-40.2).
END
C
IS FAILURE INDICATED BY IAR LED V3 AND HK LED V16?
N
(CONT BOTTOM PAGE)
Y
PERFORM SAFETY BOLT PROXIMITY SWITCHES TEST, (PARA 5-40.3). IS PROBLEM CORRECTED ?
N
(CONT PAGE 5-479)
Y
END
D
B
(FROM PAGE 5-477)
REPLACE HK CIRCUIT BOARD, (PARA 5-40.31).
END
C
(FROM TOP OF PAGE)
IS FAILURE INDICATED BY IAR LED V4 AND HK LED V11?
N
Y
PERFORM GEAR LIMIT SWITCH TEST, (PARA 5-40.5). IS PROBLEM CORRECTED ?
N
Y
END
IS FAILURE INDICATED BY IAR LED V19 AND HK LED V15?
N
(CONT PAGE 5-479)
Y
PERFORM CLAMP BALL VALVE TEST, PARA 5-40.9). IS PROBLEM CORRECTED ?
N
Y
END
E
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28). IS PROBLEM CORRECTED ?
N
(CONT PAGE 5-479)
Y
END
F

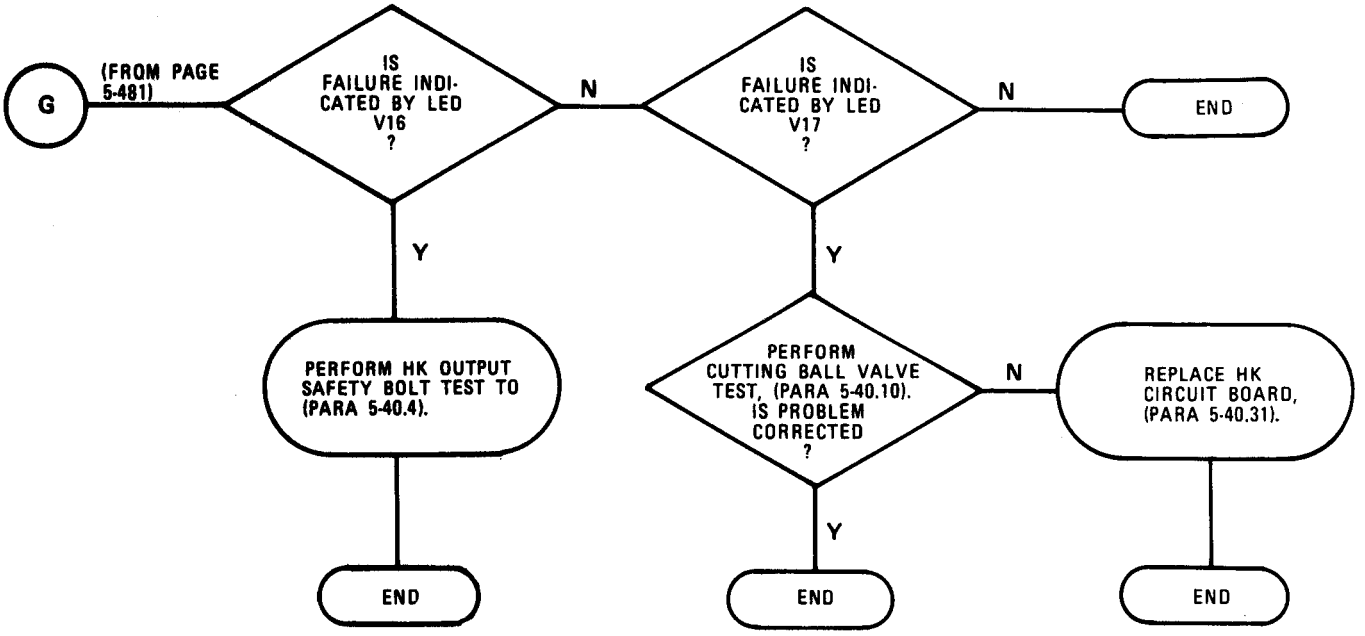

D
(CONT FROM 5-478)
PERFORM OUTPUT FROM HK CIRCUIT TO SAFETY BOLT TEST, (PARA. 5-40.4). IS PROBLEM CORRECTED?
N
REPLACE HK CIRCUIT BOARD, (PARA 5-40.31). IS PROBLEM CORRECTED ?
N
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28).
Y
END
Y
END
END
E
(CONT FROM 5-478)
IS FAILURE INDICATED BY IAR LED V23 AND HK LED V17?
N
TROUBLESHOOT AS A SEPARATE PROBLEM USING HK OR IAR FLOW CHART.
Y
PERFORM CUTTING BALL VALVE TEST (PARA 5-40.10). IS PROBLEM CORRECTED ?
N
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28). IS PROBLEM CORRECTED ?
N
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28). IS PROBLEM CORRECTED ?
N
G
(CONT AT BOTTOM)
Y
END
Y
END
Y
END
F
(CONT FROM 5-478)
REPLACE IAR CIRCUIT CARD, (PARA 5-40.28). IS PROBLEM CORRECTED ?
N
REPLACE HK CIRCUIT BOARD, (PARA 5-40.31).
Y
END
END
G
(FROM TOP OF PAGE)
REPLACE HK CIRCUIT BOARD, (PARA 5-40.31).
END

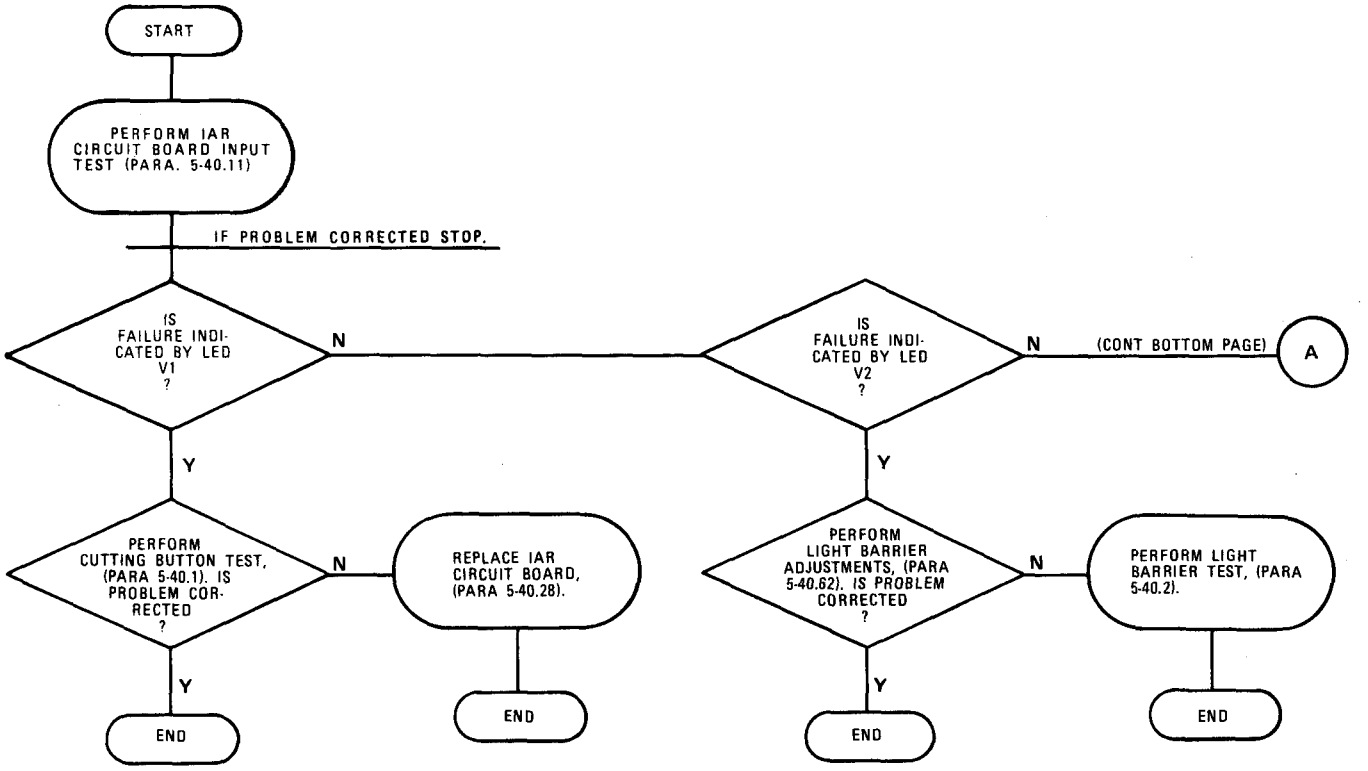

START
PERFORM HK CIRCUIT BOARD INPUT TESTS, (PARA 5-40.12)
IF PROBLEM CORRECTED STOP
IS FAILURE INDICATED BY LED V2 OR V3 ?
N
Y
IS FAILURE INDICATED BY LED V4 OR V5 ?
N
(CONT MID PAGE)
A
Y
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28). IS PROBLEM CORRECTED ?
N
Y
END
REPLACE HK CIRCUIT BOARD, (PARA 5-40.31). IS PROBLEM CORRECTED ?
N
Y
END
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28).
END
PERFORM SAFETY BOLT PROXIMITY SWITCHES TEST, (PARA 5-40.3). IS PROBLEM CORRECTED ?
N
(CONT BOTTOM PAGE)
B
Y
END

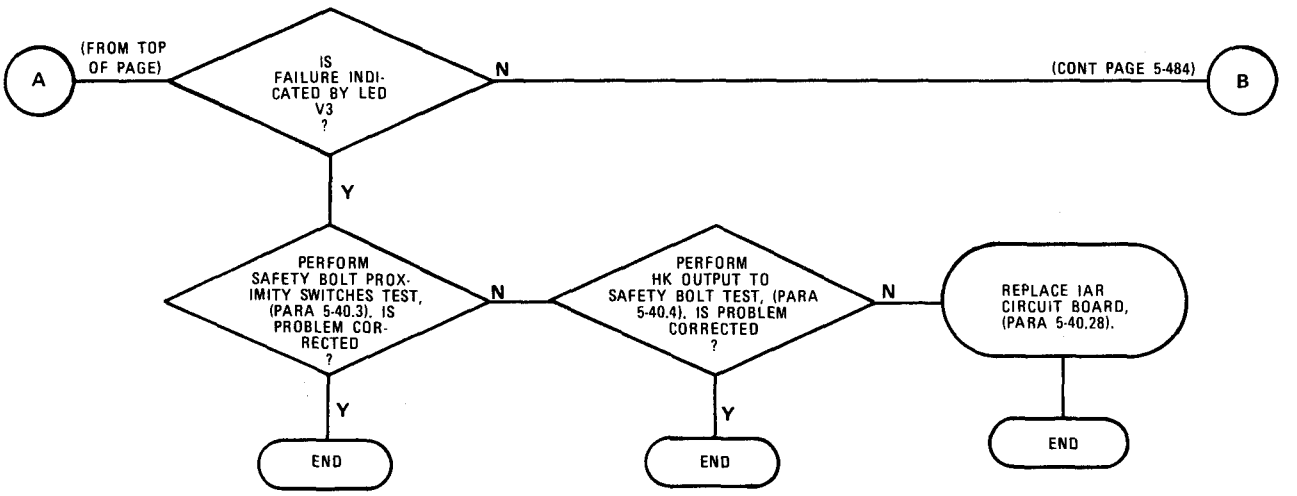

A
(FROM TOP OF PAGE)
IS FAILURE INDICATED BY LED V6, V7, V8, V9, OR V14 ?
N
Y
IS FAILURE INDICATED BY LED V10 ?
N
(CONT PAGE 5-481)
C
Y
PERFORM CUTTING BUTTON TEST, (PARA 5-40.1). IS PROBLEM CORRECTED ?
N
Y
END
REPLACE HK CIRCUIT BOARD, (PARA 5-40.31).
REPLACE HK CIRCUIT BOARD, (PARA 5-40.31). IS PROBLEM CORRECTED ?
N
(CONT PAGE 5-481)
D
Y
END

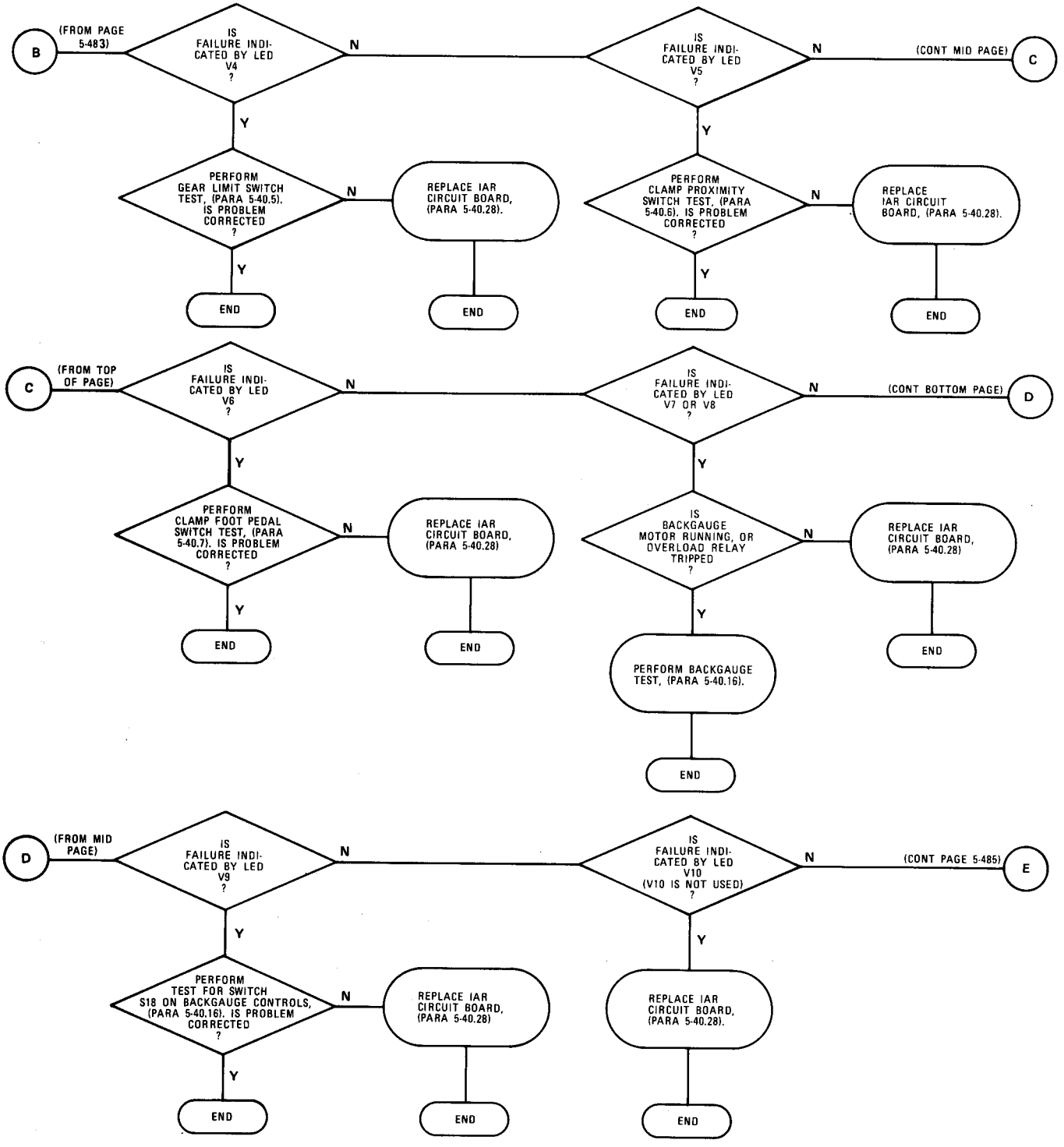

B
(FROM TOP OF PAGE)
REPLACE HK CIRCUIT BOARD (PARA 5-40.31).
END

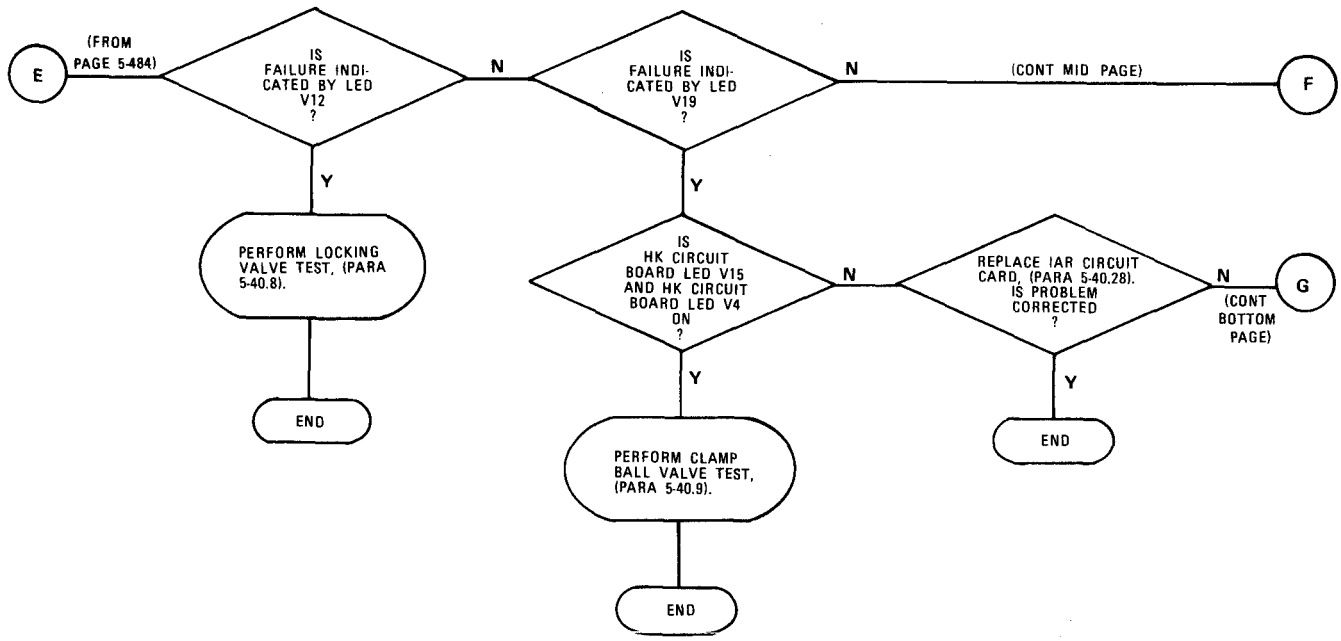

D
(FROM PAGE 5-480)
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.31). IS PROBLEM CORRECTED ?
N
REPLACE AR CIRCUIT BOARD (PARA 5-40.28).
Y
END
END
C
(FROM PAGE 5-480)
IS FAILURE INDICATED BY LED V11 ?
N
IS FAILURE INDICATED BY LED V12 OR V18 ?
N
(CONT MID PAGE)
E
Y
Y
PERFORM GEAR LIMIT SWITCH TEST, (PARA 5-40.5). IS PROBLEM CORRECTED ?
N
REPLACE HK CIRCUIT BOARD, (PARA 5-40.31)
PERFORM LIGHT BARRIER ADJUSTMENTS, (PARA 5-40.62). IS PROBLEM CORRECTED ?
N
(CONT BOTTOM PAGE)
F
Y
Y
END
END
END
E
(FROM TOP OF PAGE)
IS FAILURE INDICATED BY LED V13 ?
N
IS FAILURE INDICATED BY LED V15 ?
N
(CONT PAGE 5-482)
G
Y
Y
PERFORM KNIFE CHANGE SWITCH TEST, (PARA 5-40.13). IS PROBLEM CORRECTED ?
N
REPLACE HK CIRCUIT BOARD, (PARA 5-40.31).
PERFORM CLAMP BALL VALVE TEST, (PARA 5-40.9). IS PROBLEM CORRECTED ?
N
REPLACE HK CIRCUIT BOARD, (PARA 5-40.31).
Y
Y
END
END
END
END
F
(FROM TOP OF PAGE)
PERFORM LIGHT BARRIER TEST, (PARA 5-40.2).
END

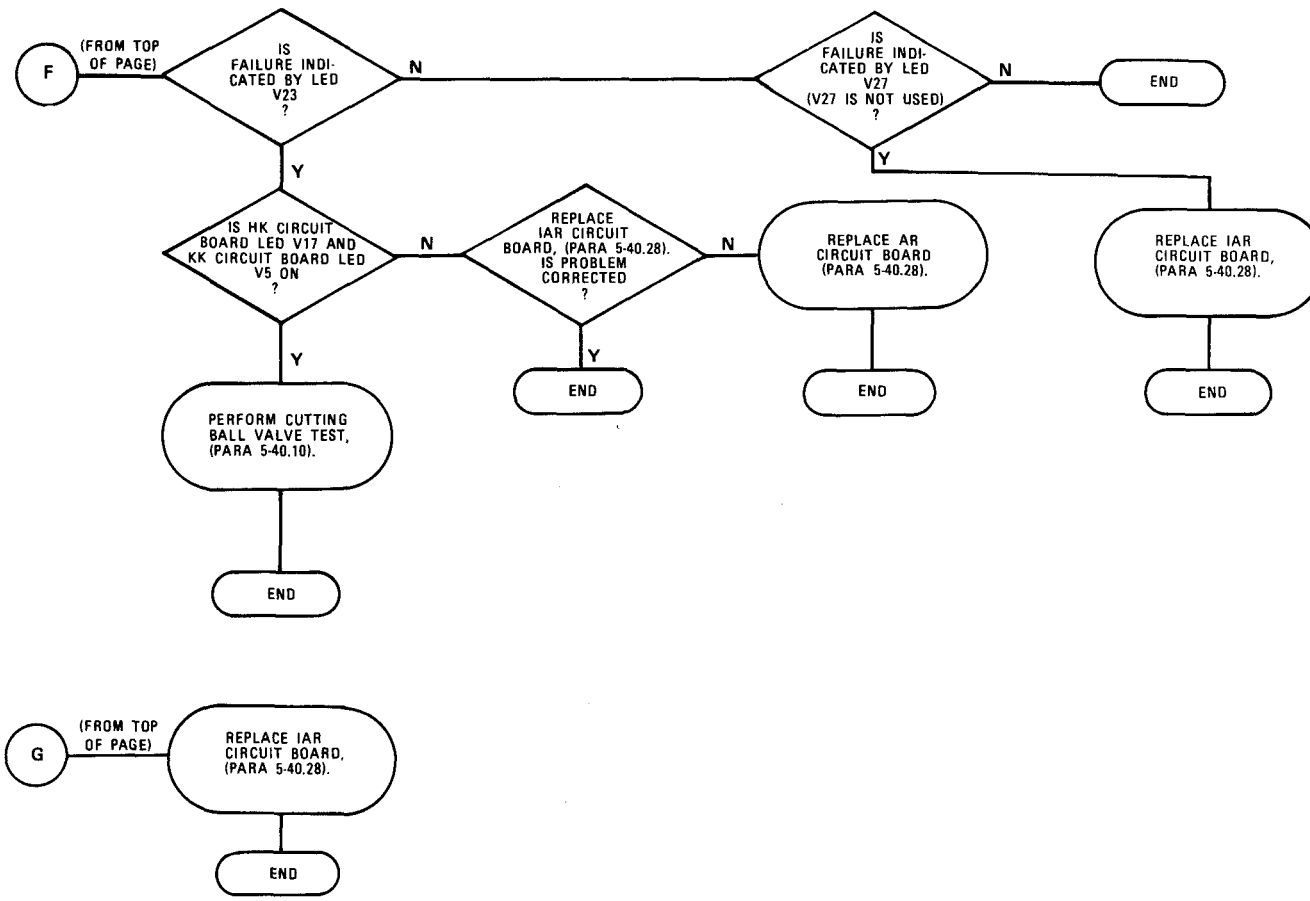

G
(FROM PAGE 5-481)
IS FAILURE INDICATED BY LED V16 ?
N
IS FAILURE INDICATED BY LED V17 ?
N
END
Y
Y
PERFORM HK OUTPUT SAFETY BOLT TEST TO (PARA 5-40.4).
PERFORM CUTTING BALL VALVE TEST, (PARA 5-40.10). IS PROBLEM CORRECTED ?
N
REPLACE HK CIRCUIT BOARD, (PARA 5-40.31).
END
Y
END
END


START
PERFORM IAR CIRCUIT BOARD INPUT TEST (PARA. 5-40.11)
IF PROBLEM CORRECTED STOP.
IS FAILURE INDICATED BY LED V1 ?
N
Y
PERFORM CUTTING BUTTON TEST, (PARA 5-40.1). IS PROBLEM CORRECTED ?
N
Y
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28).
END
END
IS FAILURE INDICATED BY LED V2 ?
N
(CONT BOTTOM PAGE)
A
Y
PERFORM LIGHT BARRIER ADJUSTMENTS, (PARA 5-40.62). IS PROBLEM CORRECTED ?
N
Y
PERFORM LIGHT BARRIER TEST, (PARA 5-40.2).
END
END


A
(FROM TOP OF PAGE)
IS FAILURE INDICATED BY LED V3 ?
N
(CONT PAGE 5-484)
B
Y
PERFORM SAFETY BOLT PROXIMITY SWITCHES TEST, (PARA 5-40.3). IS PROBLEM CORRECTED ?
N
Y
END
PERFORM HK OUTPUT TO SAFETY BOLT TEST, (PARA 5-40.4). IS PROBLEM CORRECTED ?
N
Y
END
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28).
END


B
(FROM PAGE 5-483)
IS FAILURE INDICATED BY LED V4 ?
N
Y
PERFORM GEAR LIMIT SWITCH TEST, (PARA 5-40.5). IS PROBLEM CORRECTED ?
N
Y
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28).
END
END
IS FAILURE INDICATED BY LED V5 ?
N
(CONT MID PAGE)
C
Y
PERFORM CLAMP PROXIMITY SWITCH TEST, (PARA 5-40.6). IS PROBLEM CORRECTED ?
N
Y
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28).
END
END
C
(FROM TOP OF PAGE)
IS FAILURE INDICATED BY LED V6 ?
N
Y
PERFORM CLAMP FOOT PEDAL SWITCH TEST, (PARA 5-40.7). IS PROBLEM CORRECTED ?
N
Y
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28)
END
END
IS FAILURE INDICATED BY LED V7 OR V8 ?
N
(CONT BOTTOM PAGE)
D
Y
IS BACKGAUGE MOTOR RUNNING, OR OVERLOAD RELAY TRIPPED ?
N
Y
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28)
END
PERFORM BACKGAUGE TEST, (PARA 5-40.16).
END
D
(FROM MID PAGE)
IS FAILURE INDICATED BY LED V9 ?
N
Y
PERFORM TEST FOR SWITCH S18 ON BACKGAUGE CONTROLS, (PARA 5-40.16). IS PROBLEM CORRECTED ?
N
Y
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28)
END
END
IS FAILURE INDICATED BY LED V10 (V10 IS NOT USED) ?
N
(CONT PAGE 5-485)
E
Y
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28).
END


E
(FROM PAGE 5-484)
IS FAILURE INDICATED BY LED V12 ?
N
IS FAILURE INDICATED BY LED V19 ?
N
(CONT MID PAGE)
F
Y
PERFORM LOCKING VALVE TEST, (PARA 5-40.8).
END
Y
IS HK CIRCUIT BOARD LED V15 AND HK CIRCUIT BOARD LED V4 ON ?
N
REPLACE IAR CIRCUIT CARD, (PARA 5-40.28). IS PROBLEM CORRECTED ?
N
G
(CONT BOTTOM PAGE)
Y
END
Y
PERFORM CLAMP BALL VALVE TEST, (PARA 5-40.9).
END


F
(FROM TOP OF PAGE)
IS FAILURE INDICATED BY LED V23 ?
N
IS FAILURE INDICATED BY LED V27 (V27 IS NOT USED) ?
N
END
Y
Y
IS HK CIRCUIT BOARD LED V17 AND KK CIRCUIT BOARD LED V5 ON ?
N
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28). IS PROBLEM CORRECTED ?
N
REPLACE AR CIRCUIT BOARD (PARA 5-40.28).
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28).
Y
Y
END
END
END
Y
PERFORM CUTTING BALL VALVE TEST, (PARA 5-40.10).
END

G
(FROM TOP OF PAGE)
REPLACE IAR CIRCUIT BOARD, (PARA 5-40.28).
END

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
6. ERROR MESSAGE 85 OR 86 - Cont	
Step 2. Check adjustment of gear limit switches.	(a) Adjust gear limit switches (paragraph 5-40.58). (b) If problem is not corrected, proceed to step 3.
Step 3. Check adjustment of light barrier.	(a) Adjust light barrier (paragraph 5-40.62). (b) If problem is not corrected, proceed to step 4.
Step 4. Replace HK circuit board (paragraph 5-40.31).	If problem is not corrected, proceed to step 5.
Step 5. Replace IAR circuit board (paragraph 5-40.28).	If malfunction persists, proceed to step 6.
Step 6. Replace AR circuit board (paragraph 5-40.28).	If malfunction persists, proceed to step 7.
Step 7. Replace KK circuit board (paragraph 5-40.31).	If malfunction persists, proceed to step 8.
Step 8. Replace LS circuit board (paragraph 5-40.52).	If malfunction persists, refer to electrical and electronic schematics for fault isolation.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
7. ERROR MESSAGE 87. Normally open and normally closed contact of a cutting button are simultaneously closed. Step 1. Check cutting buttons. (a) Perform cutting buttons test and replace defective parts (paragraph 5-40.1). (b) If malfunction persists, proceed to step 2. Step 2. Replace circuit board IAR (paragraph 5-40.28). If malfunction persists, proceed to step 3. Step 3. Check ribbon cable between circuit board AR and IAR and check continuity of all pins. (a) If ribbon cable is defective, replace ribbon cable (paragraph 5-40.33). (b) If ribbon cable is not defective, proceed to step 4. Step 4. Replace circuit board AR (paragraph 5-40.28). If malfunction persists, refer to electrical and electronic schematics for fault isolation.
8. ERROR MESSAGE 88 OR 92. Safety bolt, without being activated, has left locking position or is not returning to the locking position within two seconds after cutting cycle is completed. Knife is not in uppermost position. Step 1. Check safety bolt for mechanical stiffness in movement. (a) If safety bolt moves stiffly, replace safety bolt (paragraph 5-40.48). (b) If not, proceed to step 2.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

8. ERROR MESSAGE 88 OR 92 - Cont

Step 2. Check safety bolt proximity switches.

(a) Perform safety bolt proximity switches test and replace defective parts (paragraph 5-40.3).

(b) If problem is not corrected, proceed to step 3.

Step 3. Perform safety bolt test.

(a) Perform test of safety bolt and replace defective parts (paragraph 5-40.4).

(b) If problem is not corrected, proceed to step 4.

Step 4. Replace circuit board IAR (paragraph 5-40.28).

If malfunction persists, refer to electrical and electronic schematics for fault isolation.

9. ERROR MESSAGE 89 OR 90.

(89) The normally open contact of one cutting button is in closed position when control voltage is turned on.

(90) The normally closed contact of one cutting button is not in the closed position.

Check cutting buttons.

(a) Perform cutting buttons test and replace defective parts (paragraph 5-40.1).

(b) If malfunction persists, refer to electrical and electronic schematics for fault isolation.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
10. MACHINE DOES NOT CUT THROUGH MATERIAL .	Check clutch pressure.	(a) If clutch pressure is incorrect, adjust clutch pressure as necessary, (paragraph 5-40.57). (b) If correct pressure cannot be obtained, replace P2 block (paragraph 5-40.19). (c) If clamping pressure is also being affected, replace hydraulic pump (paragraph 5-40.24).
11. KNIFE PULLS SHEETS OUT FROM UNDER CLAMP.	Step 1. Check to see if clamp pressure buildup is retarded.	(a) If pressure buildup is retarded, bleed the hydraulic system (paragraph 5-40.65). (b) If problem is not corrected, proceed to step 2.
	Step 2. Check space between knife carrier and clamp during full clamping pressure and correct as necessary (paragraph 5-40.17).	
12. KNIFE CARRIER RUNS AGAINST GUIDING GIBS AT THE TOP.	Step 1. Visually check for the following damages: a. Bent connecting rod (paragraph 5-40.44). b. Bent shaft on main drive gear (paragraph 5-40.46). c. Bent eccentric bolt (paragraph 5-40.46).	If any of the preceding parts are defective, replace, using appropriate procedures.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
13. CLAMP DOES NOT DESCEND COMPLETELY WHEN USING THE FOOT PEDAL .	
Step 1. Check to see if clamp foot pedal pressure is too low.	(a) If pressure is too low, perform clamp foot pedal pressure adjustments (paragraph 5-40.55). (b) If pressure correct, proceed to step 2.
Step 2. Check for properly adjusted clamp guiding.	If out of adjustment, perform clamp guiding adjustment (paragraph 5-40.64).
14. CLAMP MOVING DOWN TOO SLOWLY DURING CUTTING CYCLE.	
Step 1. Check for air in hydraulic system.	(a) Bleed hydraulic system (paragraph 5-40.65). (b) If malfunction persists, proceed to step 2.
Step 2. Check control block for dirt or blockage.	(a) If contaminated, clean control block. (b) If not, proceed to step 3.
Step 3. Check that clamp ball valve closes.	(a) Test clamp ball valve and replace defective parts (paragraph 5-40.8). (b) If not defective, proceed to step 4.
Step 4. Check that clamp cylinder builds up pressure properly.	(a) If defective, replace clamp cylinder (paragraph 5-40.23). (b) If malfunction persists, proceed to step 5.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

14. CLAMP MOVING DOWN TOO SLOWLY DURING CUTTING CYCLE - Cont

Step 5. Pump delivery may be insufficient despite good pressure because of a defective pump.

Replace pump (paragraph 5-40.24).

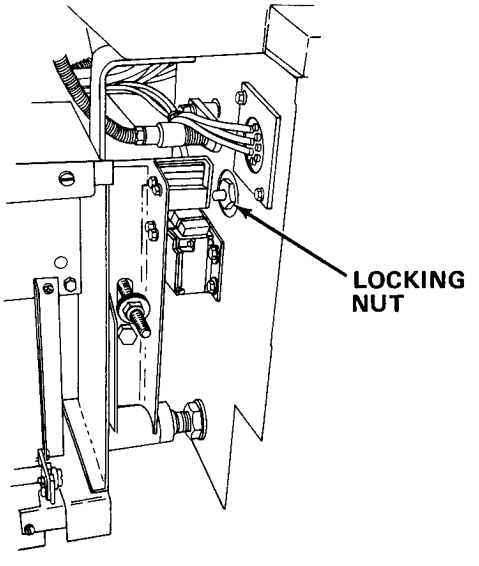
15. CLAMP RETURNING TOO SLOWLY, OR NOT AT ALL.

Step 1. Check return spring for proper tension.

(a) If adjustment is needed, adjust return spring (paragraph 5-36.19).

(b) If adjustment is not needed, proceed to step 2.

Step 2. Check that clamp control valve moves freely.



(a) If clamp control valve does not move freely, loosen clamp control valve shaft by turning locking nut around shaft.

(b) If clamp control valve moves freely, proceed to step 3.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
15. CLAMP RETURNING TOO SLOWLY, OR NOT AT ALL - Cont	
Step 3. Check that locking valve (M1) is energized and/or not jammed.	(a) Test locking valve and replace defective parts (paragraph 5-40.9). (b) If not defective, proceed to step 4.
Step 4. Check that clamp ball valve (M2) is de-energized.	Test clamp ball valve and replace defective parts (paragraph 5-40.8).
16. ROUGH FOOT PEDAL MOVEMENT.	
Check for hesitation in clamp control valve.	If clamp control valve hesitates, replace P1 block (paragraph 5-40.18).
17. CLAMP DOES NOT DESCEND.	
Check that locking valve (M1 is energized.	(a) Perform locking valve test and replace defective parts (paragraph 5-40.9). (b) If malfunction persists, refer to electrical and electronic schematics and troubleshoot.
18. NO KNIFE INCHING MODE.	
Step 1. Check for improper clutch pressure.	(a) If low, adjust clutch pressure (paragraph 5-40.57). (b) If pressure is correct, proceed to step 2.
Step 2. Replace inch valve (paragraph 5-40.21).	

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

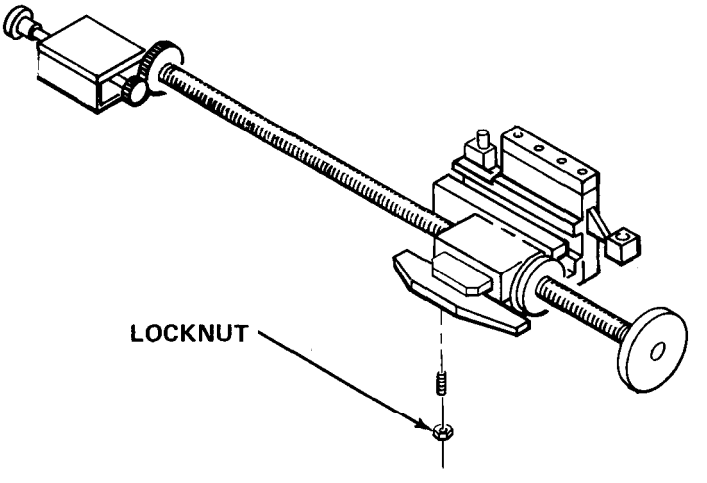
19. MEASURED BACKGAUGE POSITION AND MEASUREMENT DISPLAY ARE NOT IN AGREEMENT. ADJUSTMENT DOES NOT CORRECT PROBLEM OR BACKGAUGE POSITION DOES NOT STAY SET.

Step 1. Check for loose table spindle.

(a) If loose, tighten table spindle.

(b) If not, proceed to step 2.

Step 2. Check for play in sledge.



(a) If play is present, remove locknut and tighten spindle nut by manually turning spindle. Turn fine hand control on backgauge control knob until backgauge has no play, but is still under spring tension.

(b) If not, proceed to step 3.

Step 3. Check for play in backgauge sledge guiding rail.

(a) Adjust guiding rails (paragraph 5-36.16).

(b) If adjustment is not needed, proceed to step 4.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

19. MEASURED BACKGAUGE POSITION AND MEASUREMENT DISPLAY ARE NOT IN AGREEMENT. ADJUSTMENT DOES NOT CORRECT PROBLEM OR BACKGAUGE POSITION DOES NOT STAY SET - Cont

Step 4. Check for worn brake linings.

If brake linings are worn, replace backgauge brake (paragraph 5-40.37).

20. PAPER CUTTER IS ON. BACKGAUGE WILL NOT WORK CORRECTLY. ALL OTHER FUNCTIONS ARE OPERATIONAL.

Step 1. Check that cable connection 104 on MC unit is connected and tight.

(a) If loose or not connected, connect motor cable to connection 104.

(b) If not, proceed to step 2.

Step 2. Verify proper LED indications for backgauge controls (Table 5-22).

(a) If malfunction is noted, proceed to steps 4 through 8.

(b) If not, proceed to step 3.

Step 3. Check MC unit input/outputs.

(a) Perform MC unit input/output tests and replace defective parts (paragraph 5-40.16).

(b) If malfunction persists, refer to electrical and electronic schematics for fault isolation.

Step 4. Remove cover to backgauge control switches. Inspect switches for signs of damage.

(a) If damaged, replace backgauge control switches (paragraph 5-40.38).

(b) If not, proceed to step 5.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

20. PAPER CUTTER IS ON. BACKGAUGE WILL NOT WORK CORRECTLY. ALL OTHER FUNCTIONS ARE OPERATIONAL - Cont

Step 5. Inspect backgauge control switches while using backgauge control knob. Be sure switches are not loose and are being activated correctly.

(a) If loose, adjust backgauge control switches:

1. Loosen switch mounting screw.

2. Move switch forward or backward so that it is activated by moving backgauge control in or out, according to wiring diagram. Switch S18 is activated by pressing control in; S10 by pulling it out. Switch S14 is activated by pressing button in.

3. Position switch so its control is fully activated by nylon cam. Parts must not be jammed or broken.

4. Tighten mounting screws. Reinstall switch cover.

(b) If switches are not loose, proceed to step 6.

Step 6. Remove backgauge control switch cover. Disconnect switch wiring. Check for correct continuity (see wiring diagram) across contacts of each switch when it is activated.

(a) If continuity is not correct, replace backgauge control switch (paragraph 5-40.38).

(b) If correct, proceed to step 7.

Step 7. Check that brass slip ring on nylon cam is clean.

(a) If contaminated, clean slip ring.

(b) If not, proceed to step 8.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

20. PAPER CUTTER IS ON. BACKGAUGE WILL NOT WORK CORRECTLY. ALL OTHER FUNCTIONS ARE OPERATIONAL - Cont

Step 8. Check MC unit inputs and outputs.

(a) Perform MC unit input/output checks and replace defective parts (paragraph 5-40.16).

(b) If malfunction persists, refer to electrical and electronic schematics for fault isolation.

21. PAPER CUTTER POWER SWITCH ON. MAIN MOTOR STARTS. ALL OTHER FUNCTIONS INOPERATIVE.

Step 1. Check input circuit breakers.

WARNING

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

a. Remove power supply cover, and slide power supply out.

b. Press reset buttons on three main circuit breakers.

c. Turn on power.

d. Turn main power switch to I position.

e. Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position.

f. Press control power on switch.

(a) If paper cutter operational, end of procedure.

(b) If not, proceed to step 2.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
21. PAPER CUTTER POWER SWITCH ON. MAIN MOTOR STARTS. ALL OTHER FUNCTIONS INOPERATIVE - Cont
Step 2. Check for 220 V ac across 220 V and O Volt taps on input to transformer.
(a) If voltage is present, replace transformer (paragraph 5-40.54).
(b) If voltage is not present, proceed to step 3.
Step 3. Check for 115 ± V ac output of circuit breakers.
WARNING Death or serious injury may occur from electrical shock unless power is turned off before servicing.
(a) If voltage is not present, replace defective circuit breaker (paragraph 5-40.54).
(b) If voltage is present, proceed to step 4.
Step 4. Check for 220 V ac across line load.
WARNING Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.
(a) If voltage present, replace line load (paragraph 5-40.54).
(b) If voltage is not present, proceed to step 5.
Step 5. Check operation of control power on switch.

Table 5-23. DIRECT/GENERAL SUPPORT TROUBLESHOOTING - Cont

MALFUNCTION TEST OR INSPECTION	CORRECTIVE ACTION
21. PAPER CUTTER POWER SWITCH ON. MAIN MOTOR STARTS. ALL OTHER FUNCTIONS INOPERATIVE - Cont	

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position and then to O position.

(2) Turn main power switch to O position.

(3) Turn off circuit breaker.

b. Remove screws and control panel.

c. Pull control panel out from paper cutter and position it so that access to control power on switch is available.

d. Slide heat shrink off switch.

e. Holding the control power on switch in, check for continuity across terminals.

(1) If continuity is not present, replace control power on switch (paragraph 5-40.53).

(2) If continuity is present, replace PMD board (paragraph 5-40.54).

(3) If malfunction persists, refer to electrical and electronic schematics for fault isolation.

5-40. MAINTENANCE PROCEDURES.

a. This section contains instructions covering direct/general support maintenance functions for the paper cutter. 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 the equipment is properly functioning.

INDEX

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INDEX - Cont

5-40.1 Test Cutting Buttons (S28a and b).

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

SUPPLIES: Rubber Matting

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove front and rear electronics enclosure covers.

c. Extend circuit board HK.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

d. Turn on power.

(1) Turn main power switch to I position.

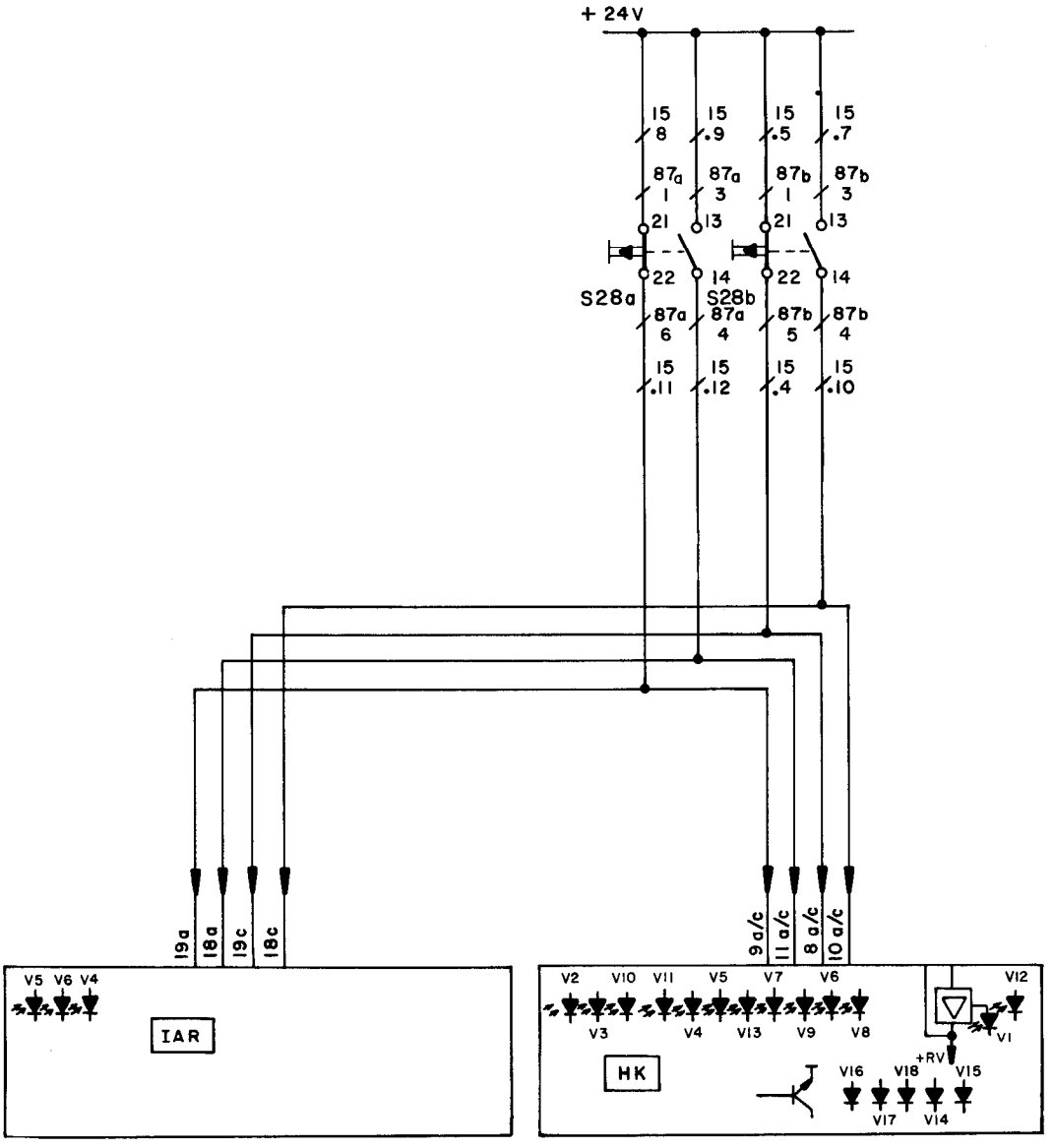
(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

e. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

f. With buttons not depressed, pins 9 a/c and 8 a/c should read +24 V, pins 10 a/c and 11 a/c should read 0 volts. Use ground post on SCU as ground.

g. With buttons depressed, pins 11 a/c and 10 a/c should read +24 V, pins 9 a/c and 8 a/c should read 0 volts. Use ground post on SCU as ground.



h. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

i. Reinstall board HK and extend circuit board IAR.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

j. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

k. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

l. With buttons not depressed, pins 19a and 19c should read +24 V, pins 18a and 18c should read 0 volts. Use ground post on SCU as ground.

m. With buttons depressed, pins 18a and 18c should read +24 V, pins 19a and 19c should read 0 volts. Use ground post on SCU as ground.

n. If all indications are correct, the cutting buttons are functioning properly.

o. If none of these indications are correct, check PS 24 output (paragraph 5-40.63). If +24 V output is correct, troubleshoot cabling between cutting buttons and SCU unit.

p. If partial failure exists, check continuity of cutting buttons. If continuity checks good, problem may now be in cabling or SCU mother-board. Check and replace as required (paragraph 5-40.34).

q. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

r. Reinstall circuit board IAR.

s. Reinstall front and rear electronics enclosure covers.

5-40.2 Test Light Barrier Outputs/Inputs.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

SUPPLIES: Rubber Matting

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove front and rear electronics enclosure covers.

c. Extend circuit board HK.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

d. Turn on power.

(1) Turn main power switch to I position.

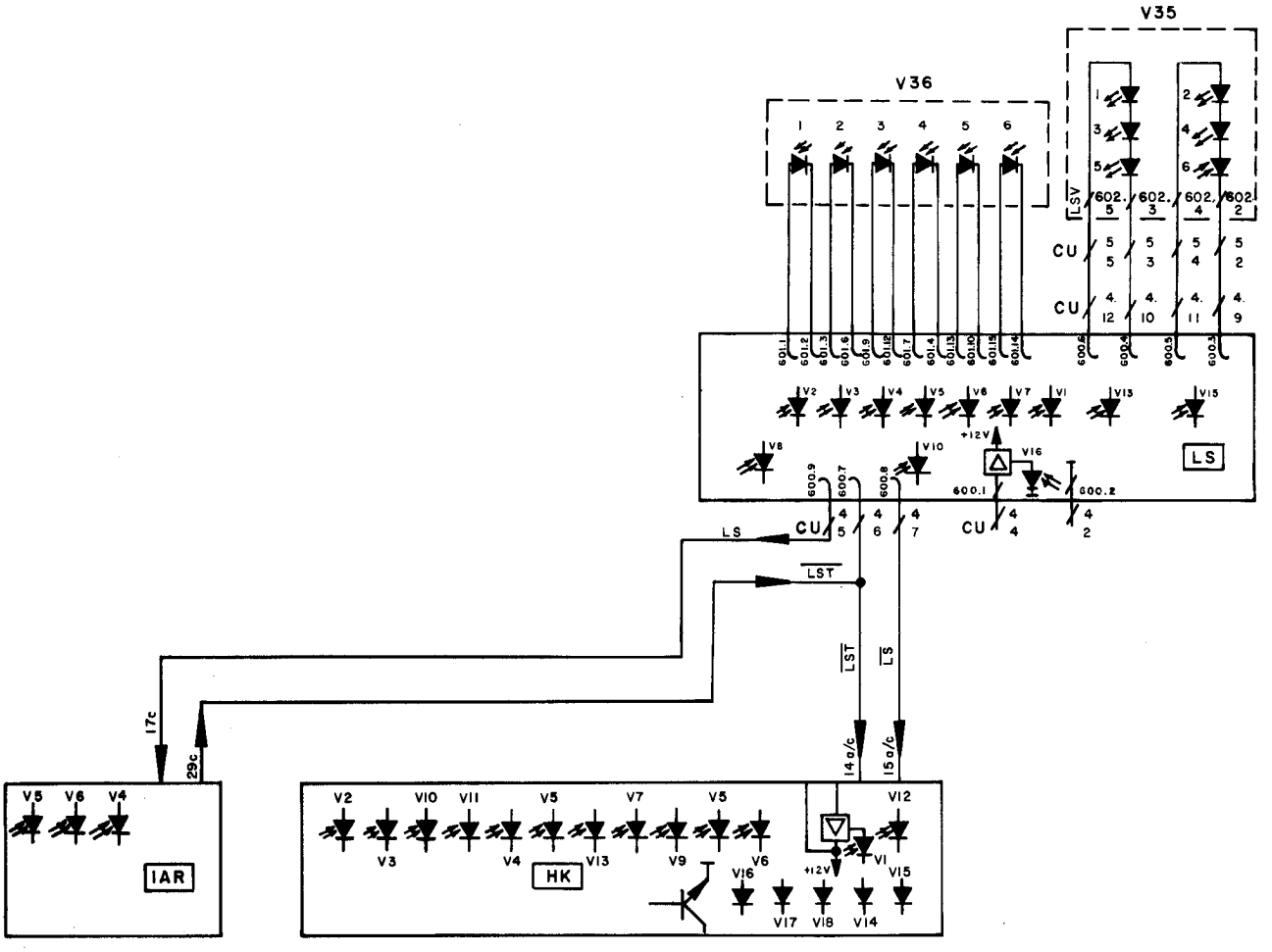
(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

e. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

f. With light barrier not interrupted, check for 0 volts at pin 15 a/c. Use ground post on SCU as ground.

g. With light barrier interrupted, check for +5.1 V at pin 15 a/c. Use ground post on SCU as ground. If +5.1 V is not present and green LED on left barrier housing is off, replace cable. If green LED is on and no +5.1 V, replace circuit board LS (paragraph 5-40.52).



h. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

i. Reinstall circuit board HK and extend circuit board IAR.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

j. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

k. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

l. With light barrier not interrupted, check for +5.1 V at 17c. Use ground post on SCU as ground. If +5.1 V is not present, replace cable.

m. Check plug connector 600 pin 1 in left barrier housing for +24 V. Use pin 2 of connector as ground. If +24 V is present, proceed to step o.

n. If missing, check +24 V output of PS 24 (paragraph 5-40.63). Check plug connectors and cable.

o. Check pin 29c for +5.1 V on circuit board IAR. Use ground post on SCU as ground. If not present, replace circuit boards IAR, HK and LS in that order until problem is corrected (paragraphs 5-40.28, 5-40.31 and 5-40.52).

p. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

q. Reinstall circuit board IAR.

r. Reinstall front and rear electronics enclosure covers.

5-40.3 Test Safety Bolt Proximity Switches (SB.A and SB.E).

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

SUPPLIES: Rubber Matting

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove front and rear electronics enclosure covers.

c. Extend circuit board HK.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

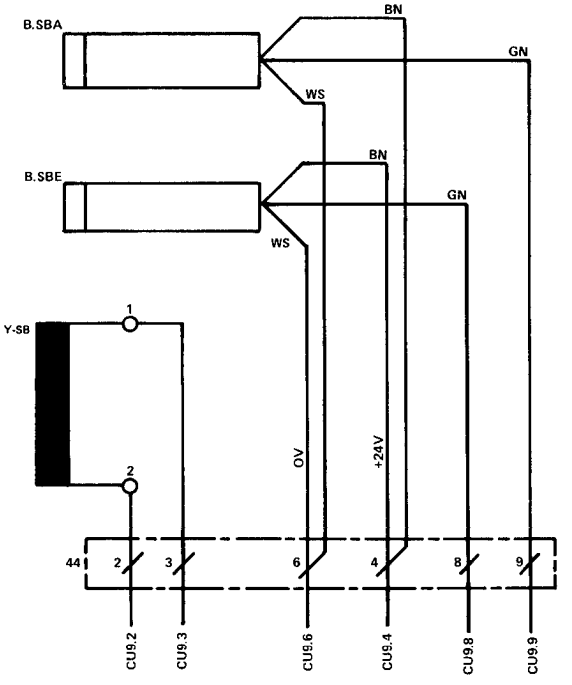
d. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

e. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.



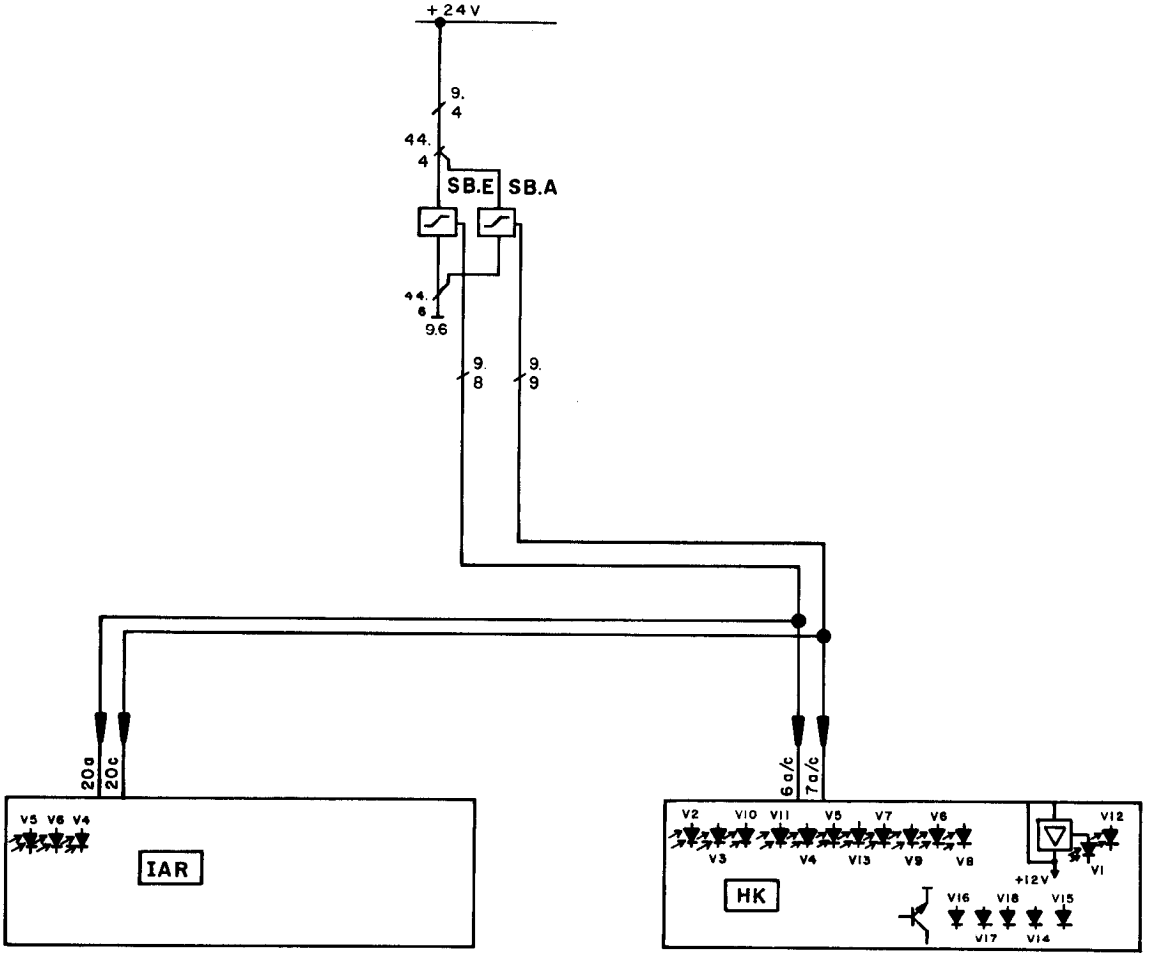
f. With safety bolt in, check pin 6 a/c for +24 V, and pin 7 a/c for 0 volts. Use ground post on SCU as ground.

NOTE

Safety bolt cover must be removed for the following step.

g. Manually position the safety bolt in energized (out) position.

h. With safety bolt out, check pin 7 a/c for +24 V, and pin 6 a/c for 0 volts. Use ground post on SCU as ground.



i. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

j. Reinstall circuit board HK and extend circuit board IAR.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

k. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

l. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

m. With safety bolt in, check pin 20a for +24 V, and pin 20c for 0 volts. Use ground post on SCU as ground.

n. Manually position the safety bolt in energized (out) position.

o. With safety bolt out, check pin 20c for +24 V, and pin 20a for 0 volts. Use ground post on SCU as ground.

p. If steps f, h, m, and o are correct, no problem exists with safety bolt proximity switches.

q. If none of these indications are correct, check PS 24 output (paragraph 5-40.63). If output is correct, troubleshoot cabling between safety bolt switches and SCU unit.

r. If +24 V was not received on pin 6 a/c of HK board (step f.), and not received on pin 20a of IAR board (step n.), check cable. If cable is good, replace proximity switches (paragraph 5-40.47).

s. If +24 V was not received on pin 7 a/c of HK board (step h.), and not received on pin 20c of IAR board (step p.), check cable. If cable is good, replace proximity switches (paragraph 5-40.47).

t. If problem is still not isolated, failure may exist in SCU motherboard. Replace motherboard (paragraph 5-40.34).

u. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

v. Reinstall circuit board IAR.

w. Reinstall front and rear electronics enclosure covers.

x. Reinstall safety bolt cover.

5-40.4 Test Output of HK Board to Safety Bolt (Y.SB).

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove front and rear electronics enclosure covers.

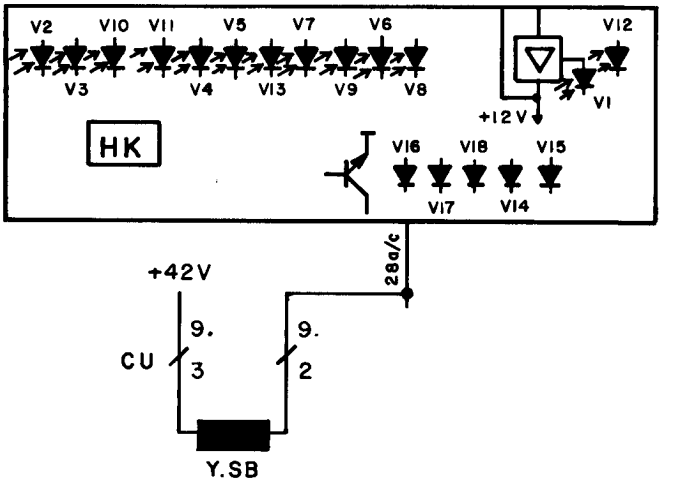
c. Remove safety bolt cover.

d. Remove plug 44.

e. Check for continuity across two wires on terminal block going to safety bolt for 40 to 50 ohms.

f. If 40 to 50 ohms is present, proceed to step h.

g. If 40 to 50 ohms is not present, replace safety bolt (paragraph 5-40.48).



h. Plug in plug 44 and reinstall safety bolt cover.

i. Remove HK circuit board. Check for 40 to 50 ohms between connector 9 pin 3 and pin 28 a/c of HK board.

j. If continuity is not present, replace cable. If present, replace HK circuit board (paragraph 5-40.31).

k. Reinstall HK circuit board.

l. Reinstall front and rear electronics enclosure covers.

5-40.5 Test Gear Limit Switches (S22a and b).

MOS: 35E, Special Electronic Devices Repairer

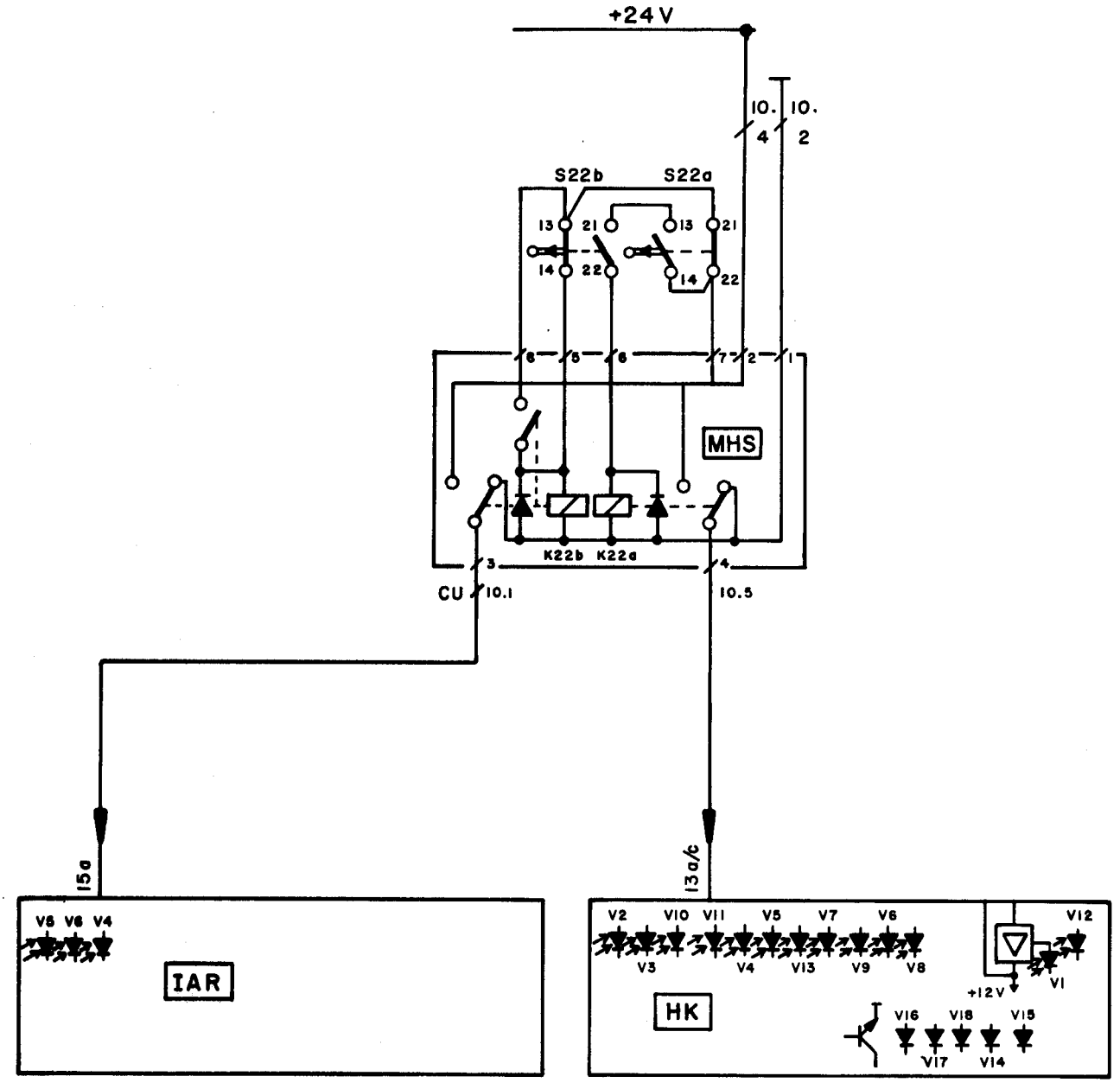
TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

SUPPLIES: Rubber Matting

a. Check adjustment of gear limit switches (paragraph 5-40.58).

b. Remove front and rear electronics enclosure covers.

c. Extend circuit board HK.



WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

d. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

e. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

f. With knife in upper position, check pin 13 a/c for 0 volts. Use ground post on SCU as ground. If voltage is present, replace gear limit switches (paragraph 5-40.45).

g. With knife in lower position, check pin 13 a/c for +24 V. Use ground post on SCU as ground. If +24 V is not present, replace gear limit switches (paragraph 5-40.45).

h. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

i. Reinstall circuit board HK, and extend circuit board IAR.

j. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

k. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

l. With knife in upper position, check pin 15a for 0 volts. Use ground post on SCU as ground. If voltage is present, replace gear limit switches (paragraph 5-40.45).

m. With knife in lower position, check pin 15a for +24 V. Use ground post on SCU as ground. If voltage is not present, replace gear limit switches (paragraph 5-40.45).

n. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

o. Reinstall front and rear electronics enclosure covers.

5-40.6 Test Clamp Proximity Switch (b29).

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

SUPPLIES: Rubber Matting

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove front and rear electronics enclosure covers.

c. Extend circuit board IAR.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

d. Turn on power.

(1) Turn main power switch to I position.

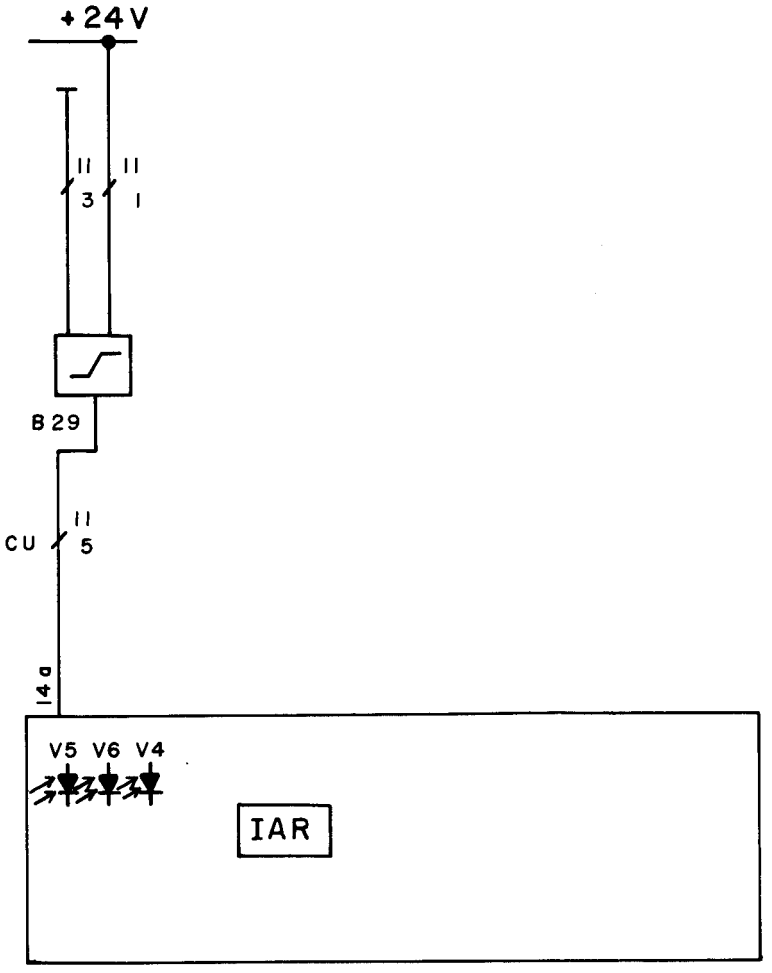
(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

e. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

f. Check pin 14a for +24 V when clamp is in the upper position. Use ground post on SCU as ground. If +24 V is not present, check adjustment of clamp proximity switches (paragraph 5-40.59).

g. If adjustment fails to correct the fault, replace the clamp proximity switch (paragraph 5-40.42).



h. Check pin 14a for 0 volts when clamp is lowered. Use ground post on SCU as ground. If voltage is present, replace clamp proximity switch (paragraph 5-40.42).

i. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

j. Reinstall circuit board IAR.

k. Reinstall front and rear electronics enclosure covers.

5-40.7 Test Clamp Foot Pedal Switch (S309).

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

SUPPLIES: Rubber Matting

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove front and rear electronics enclosure covers.

c. Extend circuit board IAR.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

d. Turn on power.

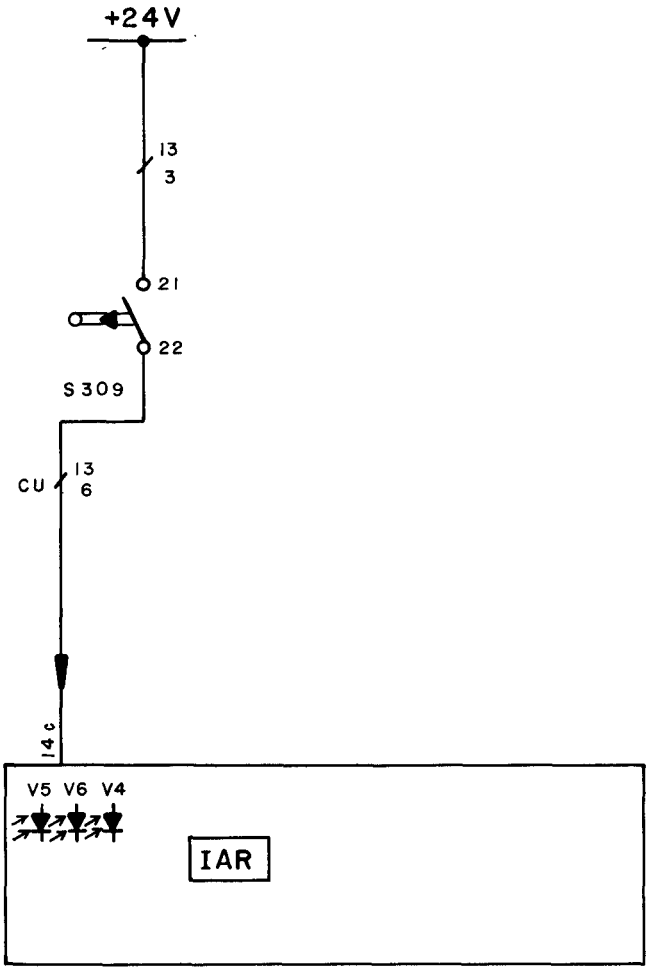
(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch toll position.

(3) Press control power on switch.

e. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

f. Without depressing clamp foot pedal, check pin 14c for 0 volts. Use ground post on SCU as ground.



g. With clamp foot pedal down, check pin 14c for +24 V. Use ground post on SCU as ground.

h. If correct indications exist, clamp foot pedal switch is good.

i. If indications are incorrect, check PS 24 output (paragraph 5-40.63). If output is correct, check clamp foot pedal switch adjustment (paragraph 5-36.18).

j. If problem still exists, switch or cabling is defective. Replace clamp foot pedal switch or cabling as appropriate (paragraph 5-40.41).

k. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

l. Reinstall circuit board IAR.

m. Reinstall front and rear electronics enclosure covers.

5-40.8 Test Solenoid Y315, (Locking Valve).

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

WARNING

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

a. Turn off power.

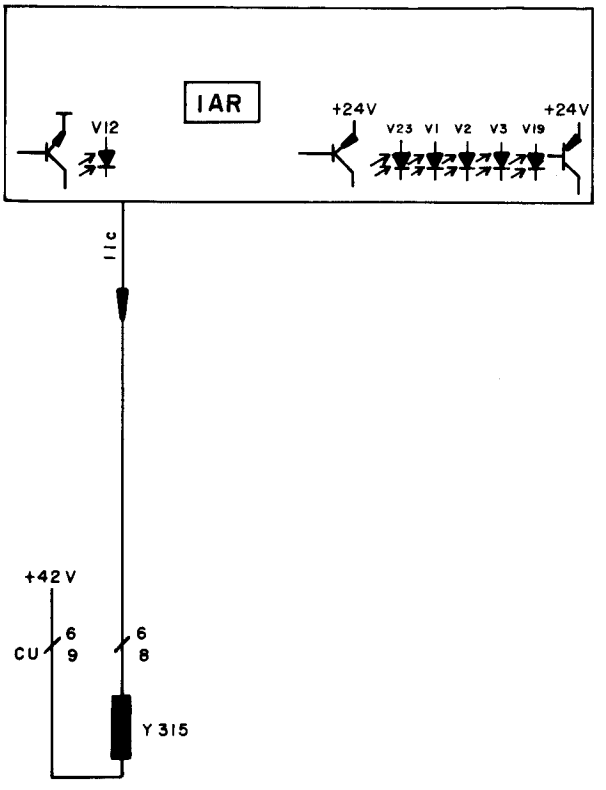
(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove front and rear electronics enclosure covers.

c. Check for continuity across solenoid on plug connector 6, pins 9 and 8 for 52 to 62 ohms.

d. If proper continuity is not present, replace locking valve (paragraph 5-40.20).



e. If continuity is present, extend circuit board IAR, and check for continuity of 52 to 62 ohms between pin 11c and connector 6, pin 9.

f. If proper continuity is present, replace IAR circuit board (paragraph 5-40.28). If not present, replace SCU motherboard (paragraph 5-40.34).

g. Reinstall circuit board IAR.

h. Reinstall front and rear electronics enclosure covers.

5-40.9 Test Solenoid Y27 (Clamp Ball Valve).

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

WARNING

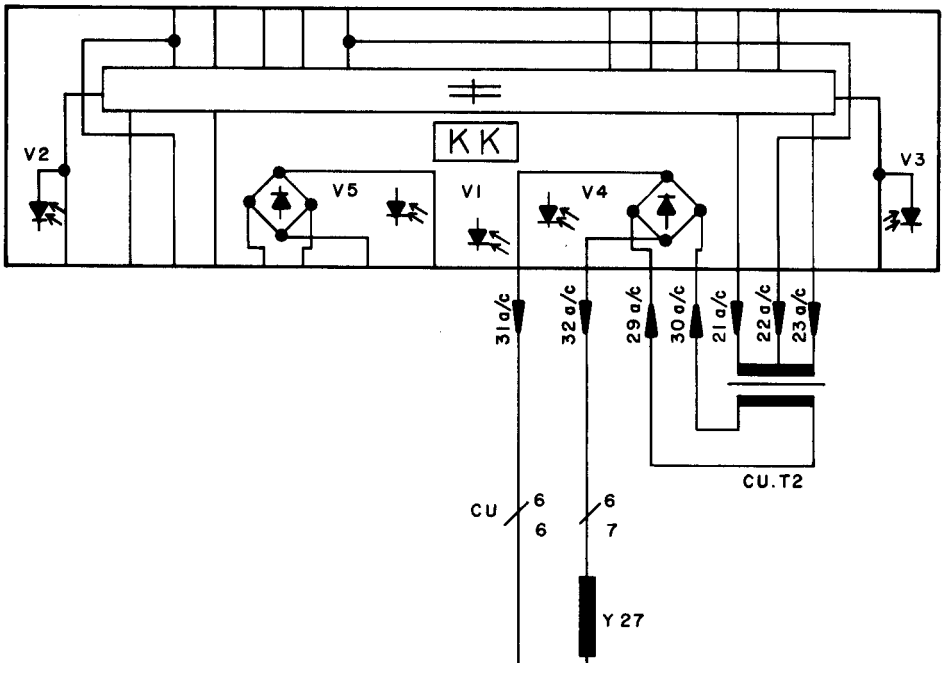
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove front and rear electronics enclosure covers.



c. Check for continuity across solenoid on plug connector 6, pins 6 and 7 for 119 to 129 ohms.

d. If continuity is not present, replace clamp ball valve (paragraph 5-40.20).

e. If continuity is present, extend circuit board KK. Check for continuity of 119 to 129 ohms between connector 6 pin 6 and pin 32 a/c of KK board. If continuity is not present, replace SCU motherboard (paragraph 5-40.34).

f. Check for continuity between connector 6, pin 7 and pin 31 a/c of KK board of 119 to 129 ohms. If continuity not present, replace SCU motherboard (paragraph 5-40.34). If present, replace circuit board KK (paragraph 5-40.31).

g. If fault is not corrected, replace transformer SCU.T2. This will involve replacement of the SCU motherboard (paragraph 5-40.34).

h. Reinstall circuit board KK.

i. Reinstall front and rear electronics enclosure covers.

5-40.10 Test Solenoid Y33 (Cutting Ball Valve).

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

WARNING

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

a. Turn off power.

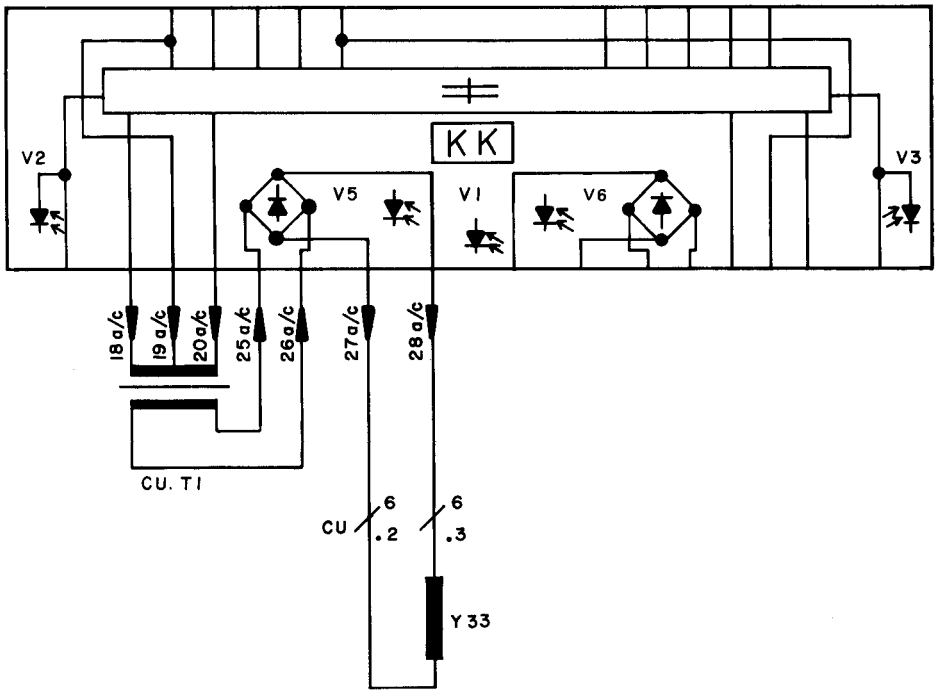
(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove front and rear electronics enclosure covers.

c. Check for continuity across solenoid on plug connector 6, pins 2 and 3 of 119 to 129 ohms.

d. If continuity is not present, replace cutting ball valve (paragraph 5-40.19).



e. If continuity is present, extend circuit board KK, check for continuity between connector 6, pin 2 and pin 28 a/c of KK board. If continuity is not present, replace SCU motherboard (paragraph 5-40.34).

f. Check for continuity between connector 6 pin 3 and pin 27 a/c on KK board. If continuity is not present, replace SCU motherboard (paragraph 5-40.34). If present, replace circuit board KK (paragraph 5-40.31).

g. If fault is not corrected, replace transformer SCU.T1. This will involve replacement of the SCU motherboard (paragraph 5-40.34).

h. Reinstall circuit board KK.

i. Reinstall front and rear electronics enclosure covers.

5-40.11 Test IAR Circuit Board for Input Power.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

SUPPLIES: Rubber Matting

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove front and rear electronics enclosure covers.

c. Extend IAR circuit board.

d. Turn on power.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

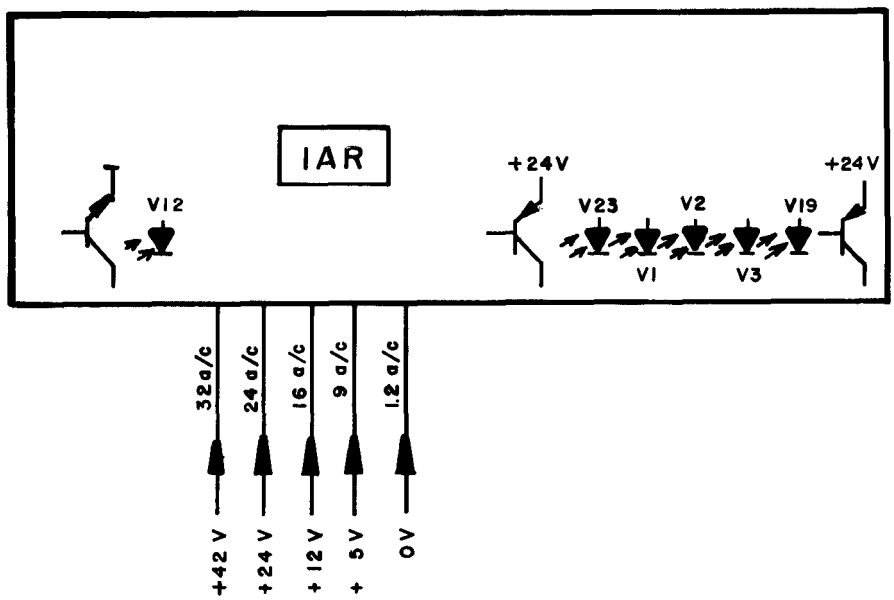
(3) Press control power on switch.

e. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

f. Check pin 9 a/c for +5.1 V. Use ground post on SCU as ground. If +5.1 V is not present, check output of PS5 (paragraph 5-40.63). If correct, replace SCU motherboard (paragraph 5-40.34).

g. Check pin 16 a/c for +12 V. Use ground post on SCU as ground. If +12 V is not present, replace HK circuit board (paragraph 5-40.31).

h. Check pin 24 a/c for +24 V. Use ground post on SCU as ground. If +24 V is not present, check output of PS24. If correct, replace SCU motherboard (paragraph 5-40.34).



i. Check pin 32 a/c for +42 V Use ground post on SCU as ground. If +42 V missing, check +42 V output of PMD circuit. If correct, replace SCU motherboard (paragraph 5-40.34).

j. Turn off power.

(1) Turn Star-Delta switch to Y, then to O position.

(2) Turn main power switch to O position.

k. Remove IAR circuit board from extender card and reinstall IAR circuit board.

l. Reinstall front and rear electronics enclosure covers.

5-40.12 Test HK Circuit Board for Input Power.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

SUPPLIES: Rubber Matting

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove front and rear electronics enclosure covers.

c. Extend HK circuit board.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

d. Turn on power.

(1) Turn main power switch to I position.

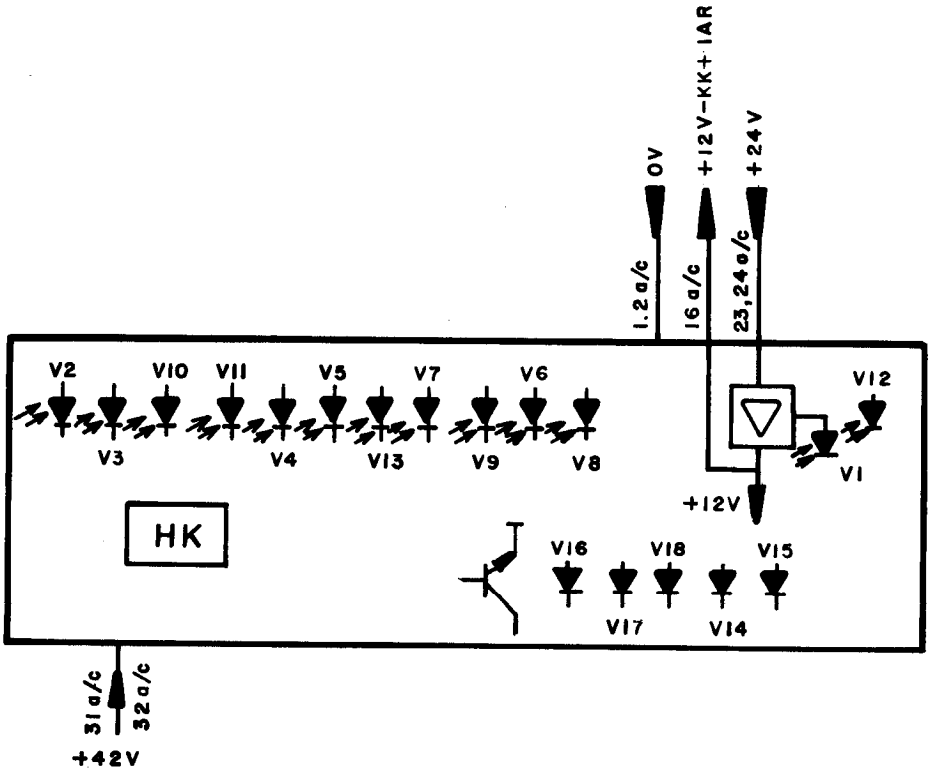
(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

e. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

f. Check pins 23 a/c and 24 a/c for +24 V. Use ground post on SCU as ground. If +24 V missing, check plug connector and cable. Check output of PS 24 (paragraph 5-40.63). If all correct, replace SCU motherboard (paragraph 5-40.34).

g. Check pins 31 a/c and 32 a/c for +42 V. Use ground post on SCU as ground. If +42 V missing, check plug connector and cable. Check +42 V output of PMD circuits. If all correct, replace SCU motherboard (paragraph 5-40.34).



h. Check pin 16 a/c for +12 V output. Use ground post on SCU as ground. If +12 V missing, replace HK circuit board (paragraph 5-40.31).

i. Turn off power.

(1) Turn Star-Delta switch to Y, then to O position.

(2) Turn main power switch to O position.

j. Remove extender board and reinstall HK circuit board.

k. Reinstall front and rear electronics enclosure covers.

5-40.13 Test Knife Changing Switch (S340).

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

SUPPLIES: Rubber Matting

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove front and rear electronics enclosure covers.

c. Extend HK circuit board.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

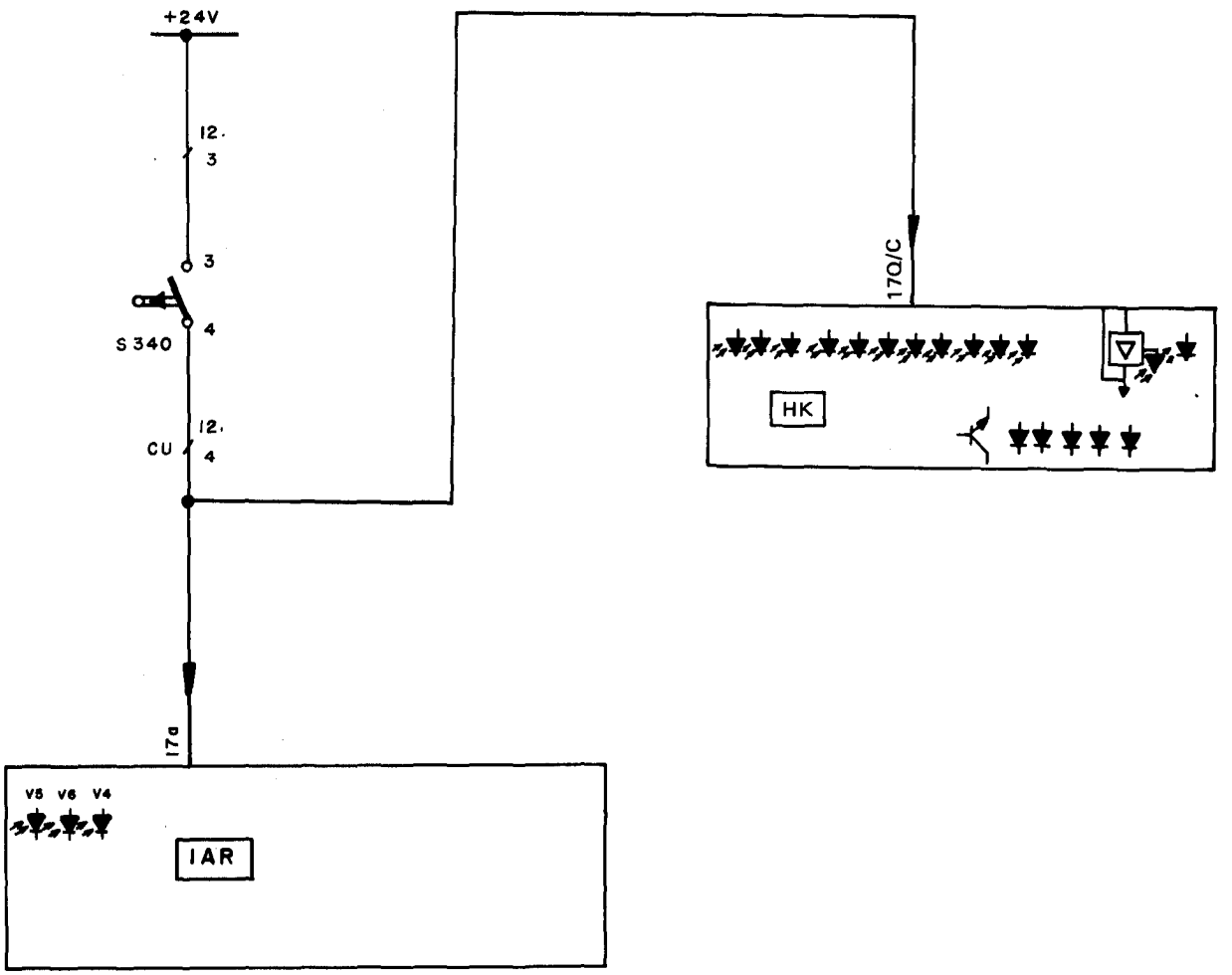
d. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

e. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.



f. With clamp pressure adjustment knob pulled out, check pin 17 a/c for +24 V. Use ground post on SCU as ground.

g. Press clamp pressure adjustment knob in and check pin 17 a/c for 0 volts. Use ground post on SCU as ground.

h. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

i. Reinstall HK board and extend circuit board IAR.

j. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

k. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

l. With clamp pressure adjustment knob pulled out, check pin 17a for +24 V. Use ground post on SCU as ground.

m. Press clamp pressure adjustment knob in and check pin 17a for 0 volts. Use ground post on SCU as ground.

n. If correct indications are received, knife changing switch and cabling is good.

o. If none of these indications are correct, check PS 24 output (paragraph 5-40.63). If output is correct, switch or cabling is defective.

p. Turn off power.

(1) Turn Star-Delta switch to Y position and then to O position.

(2) Turn main power switch to O position.

q. Remove extender board and reinstall IAR circuit board.

r. Reinstall front and rear electronics enclosure covers.

5-40.14 Test KK Circuit Board for Input Power.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

SUPPLIES: Rubber Matting

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove front and rear electronics enclosure covers.

c. Extend KK circuit board.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

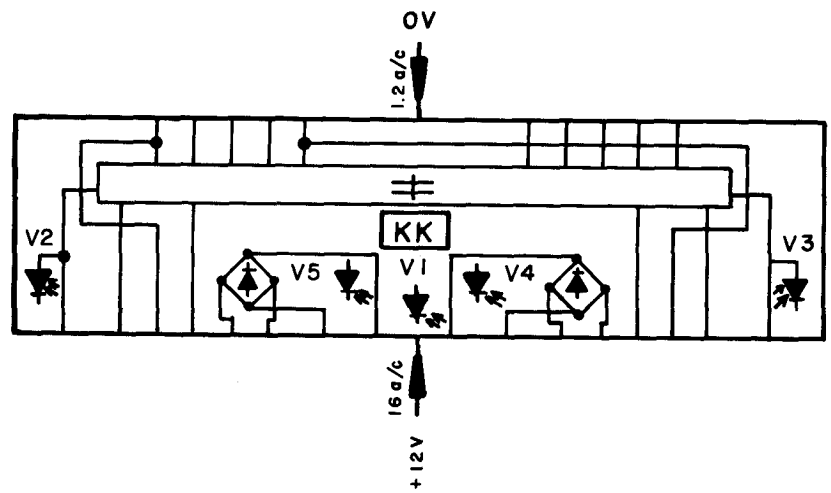
d. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

e. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.



f. Check pin 16 a/c for +12 V. Use ground post on SCU as ground.

g. If +12 V is not present, replace HK circuit board (paragraph 5-40.31).

h. If problem still exists, replace SCU motherboard (paragraph 5-40.34).

i. Turn off power.

(1) Turn Star-Delta switch to Y position and then to O position.

(2) Turn main power switch to O position.

j. Remove extender board and reinstall HK circuit board.

k. Reinstall front and rear electronics enclosure covers.

5-40.15 Test AR Circuit Board for Input Power.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter
Extender Board

SUPPLIES: Rubber Matting

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove front and rear electronics enclosure covers.

c. Extend AR circuit board.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

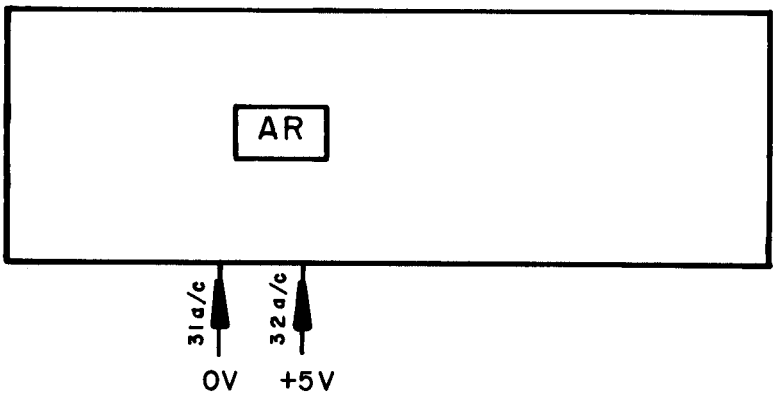
d. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

e. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.



f. Check pin 32 a/c for +5.1 V. Use ground post on SCU as ground.

g. If +5.1 V is not present, check output of PS5 (paragraph 5-40.63). If correct, replace SCU motherboard (paragraph 5-40.34).

h. Turn off power.

(1) Turn Star-Delta switch to Y position and then to O position.

(2) Turn main power switch to O position.

i. Remove extender card and reinstall AR circuit board.

j. Reinstall front and rear electronics enclosure covers.

5-40.16 Test Inputs and Outputs of MC Unit Plug Connectors.

MOS: 35E, Special Electronic Devices Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
Digital Multimeter

SUPPLIES: Rubber Matting

a. Remove front and rear electronics enclosure covers.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

b. Turn on power.

(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

c. Move backgauge forward or backward as required until the backgauge position is displayed on the measurement display.

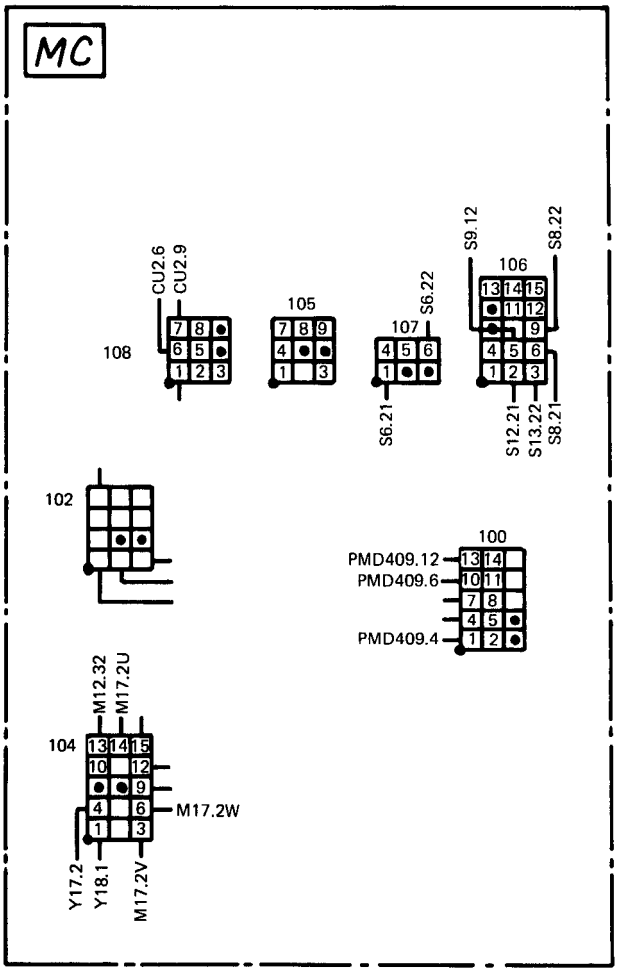
d. Check for 115 V act ± 5 V on pins 7, 10, and 13 of plug connector 100. Use pin 1 of plug connector 100 as ground.

e. If 115 V ac ± 5 V is not present on one or more pins, check circuit breakers on PM unit.

NOTE

- For proper ground for measuring dc, use plug 108, pin 4.
- For proper ground for measuring ac, use plug 100, pin 1.

f. Check for +24 V on pin 1 of plug connector 104. If +24 V is present, proceed to step h.

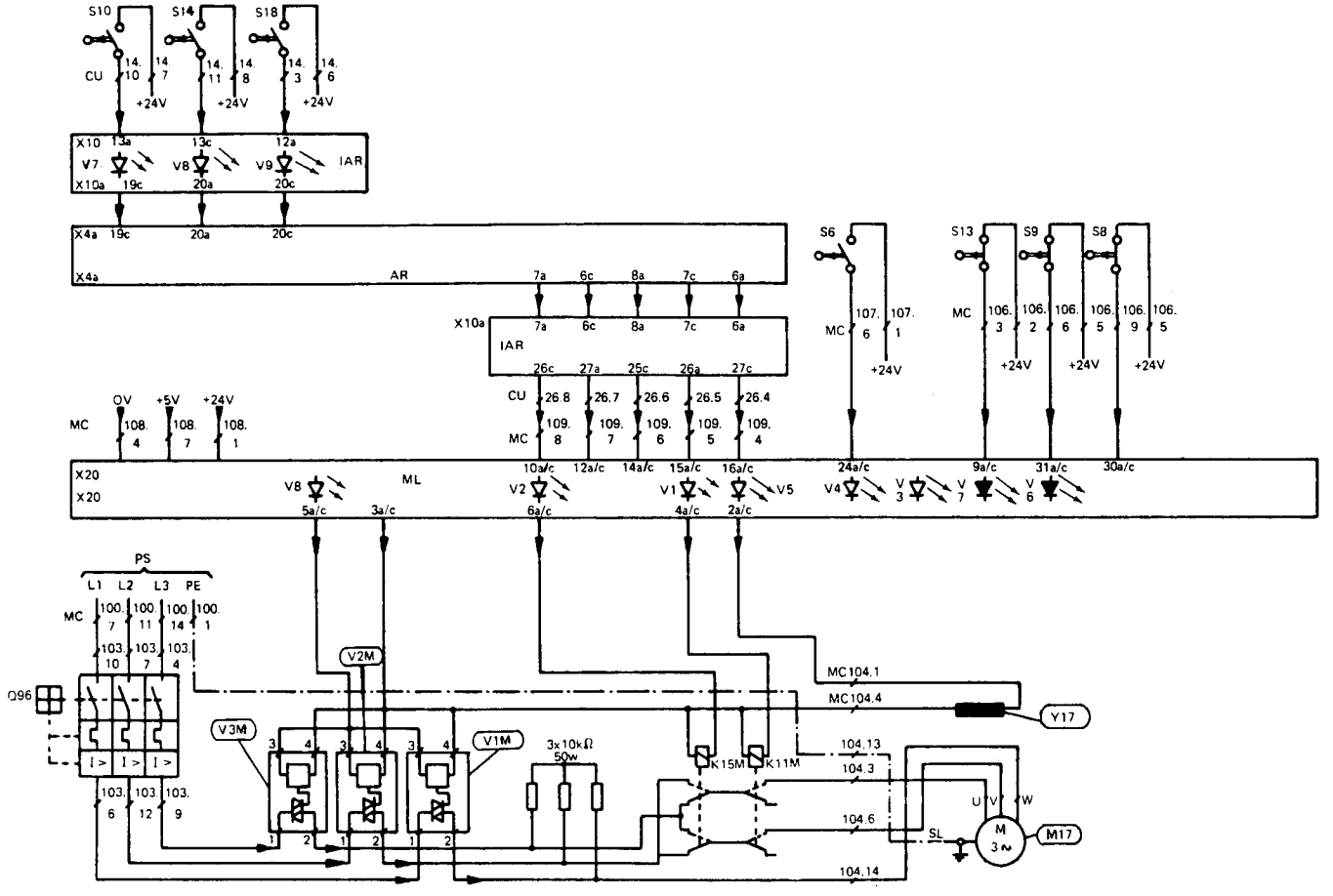


g. If voltage is not present, check pin 1 of plug connector 108 for +24 V, If +24 V is present, replace ML circuit board (paragraph 5-40.29). If not present, check PS 24 outputs (paragraph 5-40.63).

WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

h. Check for +24 V at pin 4 of plug connector 104 when not using the backgauge controls. When using backgauge control, verify that pin 4 drops to 0 volts.



i. If any indication is not correct, replace ML circuit board (paragraph 5-40.29).

j. Check pins 3, 6, and 14 of plug connector 104 for 115 V ac ± 5 V during electrical backgauge operations. If correct voltage is present, proceed to step 1.

k. If indications are incorrect, check for 115 V ac ± 5 V at terminal 1 of electronic relays V1, V2, and V3. If inputs are incorrect, verify that the backgauge overload relay is not tripped. If tripped, reset. If not, replace overload relay (paragraph 5-36.8). If inputs are correct, check for 115 V ac ± 5V on terminal 2 of electronic relays V1, V2, and V3 during backgauge operations. If indications correct, replace MC unit motherboard (paragraph 5-40.35). If voltage is not present, replace defective relay (paragraph 5-40.36).

l. Check for +24 V at pins 2 and 5 of plug connector 106. If correct voltage is not indicated, replace MC unit motherboard (paragraph 5-40.35).

m. Check pin 3 of plug connector 106 for +24 V when back limit switch (S13) is not activated, and 0 volts when activated. If incorrect indication is received, replace switch S13 (paragraph 5-40.39).

NOTE

Hold down false clamp switch and ensure that false clamp is removed from clamp.

n. Check pin 6 of plug connector 106 for +24 V when front limit switch without false clamp (S9) is not activated, and O volts when activated. If incorrect, replace switch S9 (paragraph 5-40.43).

NOTE

Install false clamp.

o. Check pin 9 of plug connector 106 for +24 V when front limit switch with false clamp (S8) is not activated, and O volts when activated. If incorrect, replace switch S8 (paragraph 5-40.39).

p. Check pin 1 of plug connector 107 for +24 V. If voltage is incorrect, replace MC unit motherboard (paragraph 5-40.35).

q. Check pin 6 of plug connector 107 for +24 V with false clamp switch (S6) not activated and O volts when activated. If incorrect, replace false clamp switch S6 (paragraph 5-40.43).

r. Check pin 7 of plug connector 108 for +5.1 V. If incorrect voltage is indicated, check PS5 circuit board (paragraph 5-40.63).

s. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

t. Reinstall front and rear electronics enclosure covers.

5-40.17 Check Clearance Between Knife and Clamp.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS: Flat Tip Screwdriver
Knife Reset Handles
Knife Carrying Handles
Metric Feeler Gage (0.3 mm)

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

b. Remove main motor V-belt cover.

c. Remove clutch V-belt (paragraph 5-36.4).

WARNING

Keep hands and feet clear of main motor and hydraulic pump V-belt.
Death or serious injury may occur from failure to do so.

d. Turn on power.

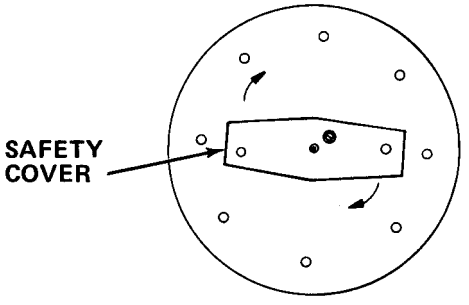
(1) Turn main power switch to I position.

(2) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position.

(3) Press control power on switch.

e. Move the backgauge forward or backward as required until backgauge position is displayed on the measurement display.

f. Place a pile of paper under the clamp.



g. Using the tip of the knife carrying handle, press in the locking pin and rotate the safety cover to the right to gain access to the override holes on clutch.

h. Insert the knife reset handles into the holes.

i. Pressing in on the handles, rotate the pulley until the threads engage, then tighten the handles.

WARNING

Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.

j. Have an assistant press and hold the cutting buttons.

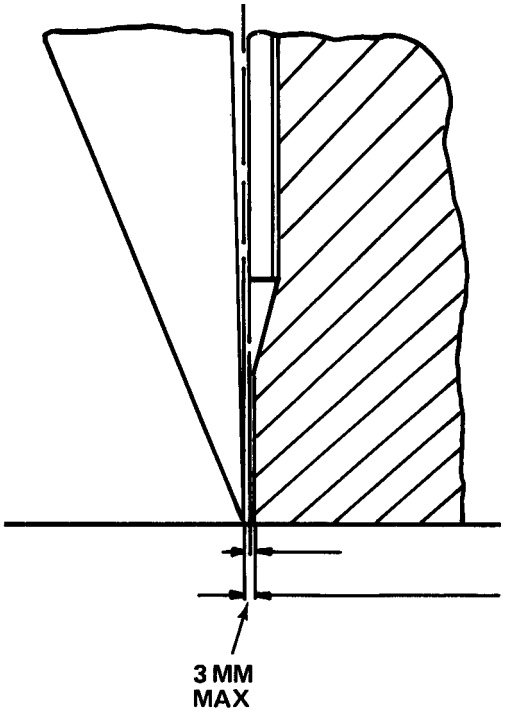
WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

k. Manually lower the knife to the height of the clamp.

l. Check the clearance between the knife and the clamp.

m. Release the cutting buttons.



n. If the space is greater than 0.3 mm (.012 in.), remove foils behind side ledge of clamp as required (paragraph 5-40.64).

o. Manually position knife to its uppermost position.

p. Remove knife reset handles and rotate safety plate to cover override holes.

q. Turn Star-Delta switch to Y position and then to O position.

r. Reinstall main motor V-belt (paragraph 5-36.4).

s. Reinstall main motor V-belt cover.

5-40.18 Replace P1 Block.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
13 mm Socket with 3/8 in. Drive
8 mm Hex Head Socket Bit with 3/8 in. Drive
3/8 in. Drive Ratchet

SUPPLIES: P1 Block
O-rings

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

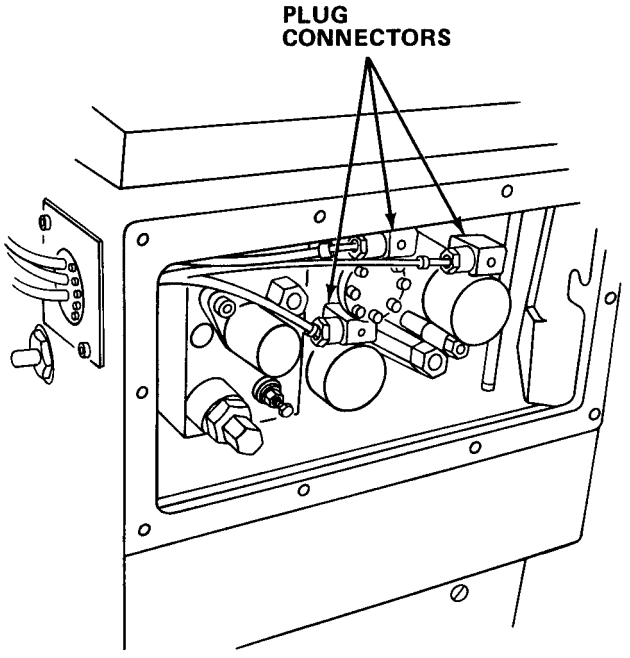
(2) Turn main power switch to O position.

(3) Using the operator key, lock safety lock and keep key in your possession.

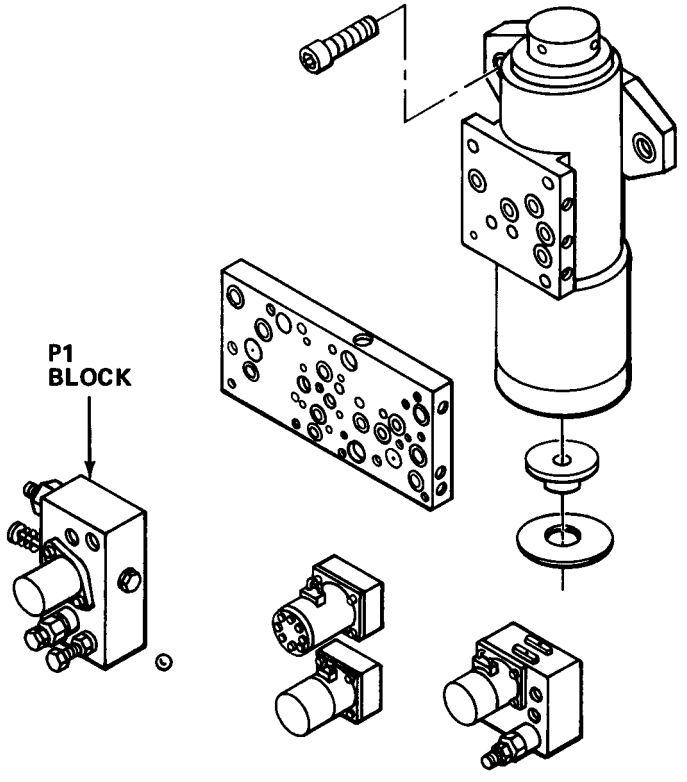
b. Remove front electronics enclosure cover.

c. Remove right pillar cover.

d. Remove bolts and hydraulic system cover plate.



e. Remove screws, tag and disconnect plug connectors. Carefully set them aside. Do not allow connectors to fall into the hydraulic fluid.



f. Remove mounting bolts and defective P1 block. Do not retain O-rings.

NOTE

Always use new O-rings.

g. Install new O-rings and new P1 block. Secure with mounting bolts.

h. Reconnect plug connectors.

i. Bleed the hydraulic system (paragraph 5-40.65).

j. Adjust clamp foot pedal pressure (paragraph 5-40.55).

k. Adjust clamp pressure (paragraph 5-40.56).

5-40.19 Replace P2 Block.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
13 mm Socket with 3/8 in. Drive
3/8 in. Drive Ratchet
4 mm Hex Head T-Wrench

SUPPLIES: P2 Block
O-rings

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

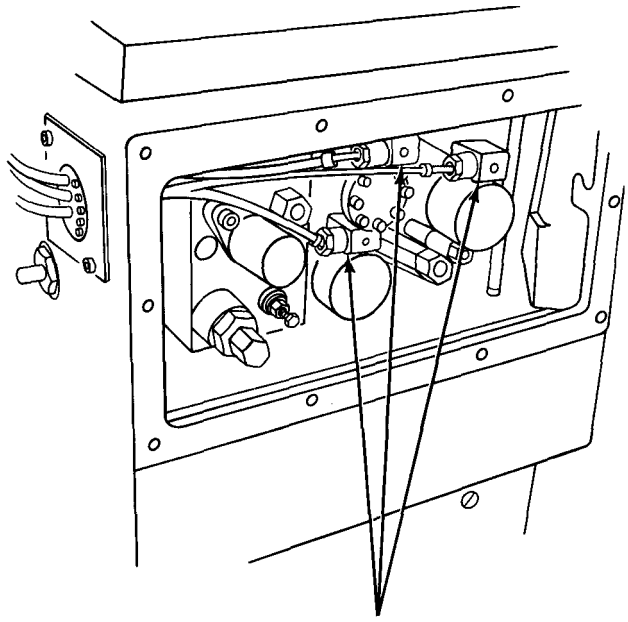
(2) Turn main power switch to O position.

(3) Using the operator key, lock safety lock and keep key in your possession.

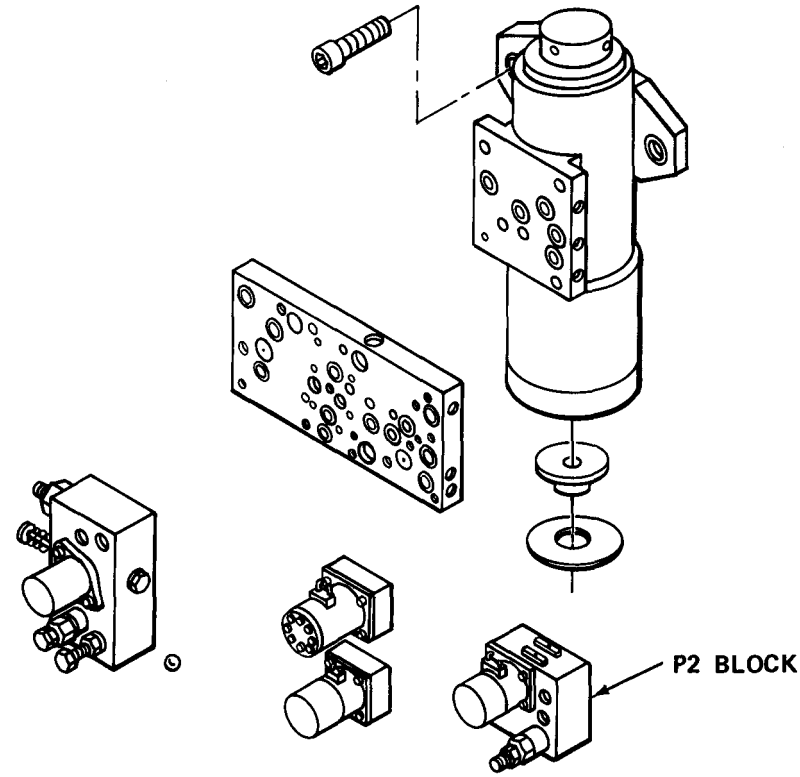
b. Remove front electronics enclosure cover.

c. Remove right pillar cover.

d. Remove bolts and hydraulic system cover plate.



e. Remove screws, tag and disconnect plug connectors. Carefully set them aside. Do not allow connectors to fall into the hydraulic fluid.



f. Remove mounting bolts and defective P2 block. Do not retain O-rings.

NOTE

Always use new O-rings.

g. Install new O-rings and new P2 block. Secure with mounting bolts.

h. Reconnect plug connectors.

i. Bleed the hydraulic system (paragraph 5-40.65).

j. Adjust clutch pressure (paragraph 5-40.57).

5-40.20 Replace Locking Valve M1, or Clamping Valve M2.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
13 mm Socket with 3/8 in. Drive
4 mm Hex Head Socket Bit with 3/8 in. Drive
3/8 in. Drive Ratchet

SUPPLIES: Locking Valve
Clamping Valve
O-Rings

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

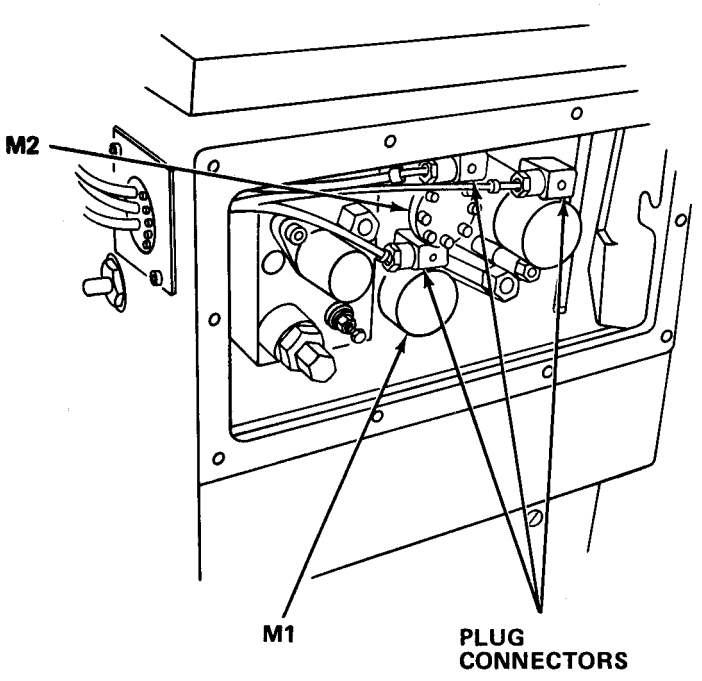
(2) Turn main power switch to O position.

(3) Using the operator key, lock safety lock and keep key in your possession.

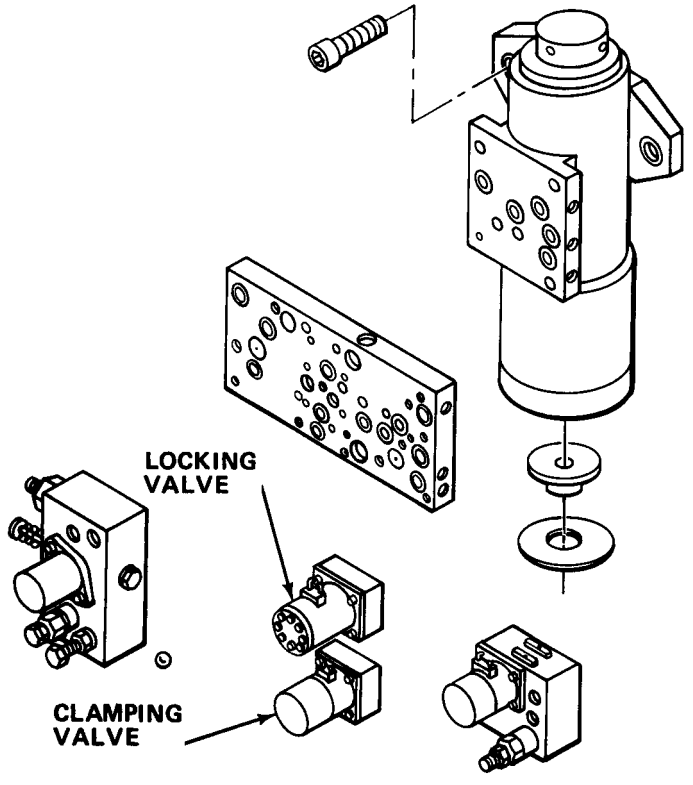
b. Remove front electronics enclosure cover.

c. Remove right pillar cover.

d. Remove bolts and hydraulic system cover plate.



e. Remove screws, tag and disconnect plug connectors. Carefully set them aside. Do not allow connectors to fall into the hydraulic fluid.



f. Remove mounting bolts and defective valve. Do not retain O-rings.

NOTE

Always use new O-rings.

g. Install new O-rings and new valve and secure with mounting bolts.

h. Reconnect plug connectors.

i. Bleed the hydraulic system (paragraph 5-40.65).

5-40.21 Replace Inch Valve.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
13 mm Combination Wrench
27 mm Combination Wrench
22 mm Combination Wrench
Fluid Evacuating Pump

SUPPLIES: Inch Valve
Pail

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove front electronics enclosure cover.

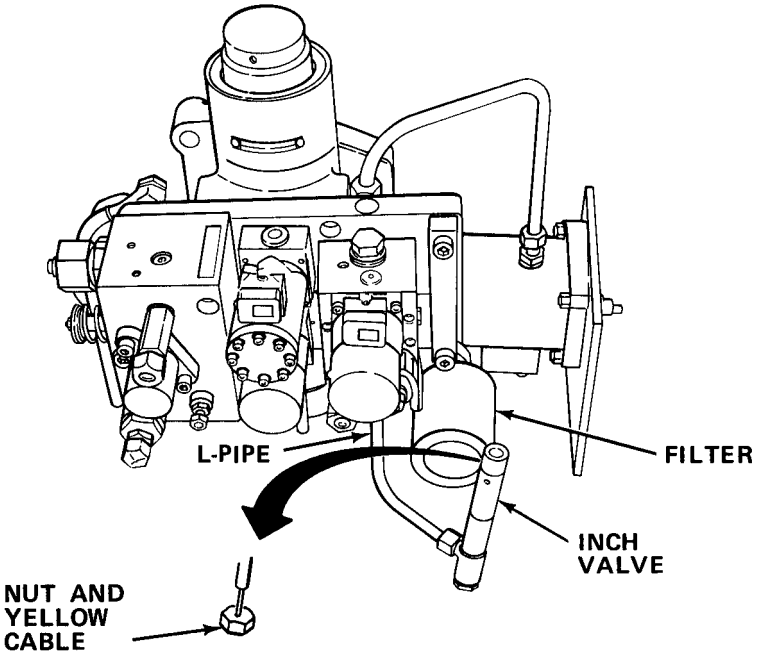
c. Remove right pillar cover.

d. Remove hydraulic system cover plate.

NOTE

If hydraulic fluid is to be reused, be sure pail is clean before placing fluid into it.

e. Using fluid evacuating pump, remove all hydraulic fluid from reservoir.



f. Remove nut and yellow cable from top of inch valve.

g. Remove large filter to allow for access to inch valve.

h. Loosen nut at top portion of L-pipe. Remove pipe and defective inch valve.

i. Install pipe to new inch valve and tighten nut.

j. Reinstall large filter.

k. Reinstall yellow cable to top of inch valve and secure with nut.

l. Fill hydraulic reservoir with 17 liters (4.5 gallons) of fluid. Observe sight glass for exact quantity required.

m. Bleed hydraulic system (paragraph 5-40.65).

5-40.22 Replace Hydraulic Control Block.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
13 mm Socket with 3/8 in. Drive
8 mm Hex Head Socket Bit with 3/8 in. Drive
3/8 in. Drive Ratchet.
22 mm Combination Wrench
4 mm Hex Head T-Wrench

SUPPLIES: Control Block
O-Rings
Copper Washers

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

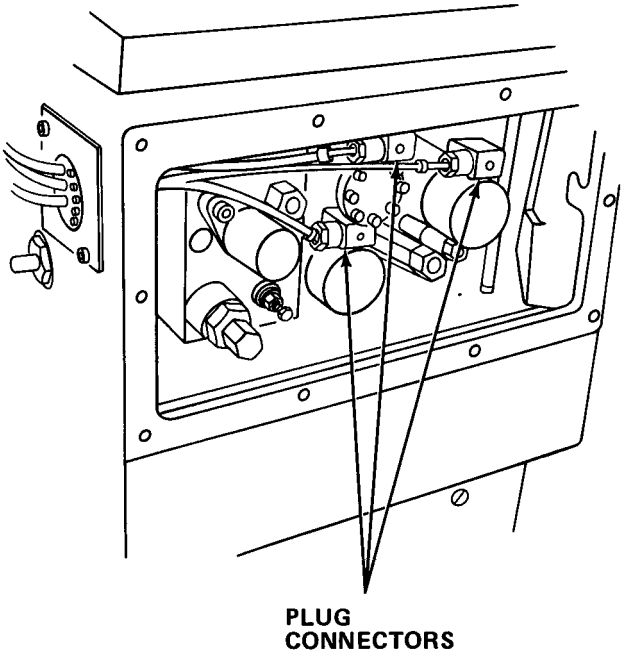
(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

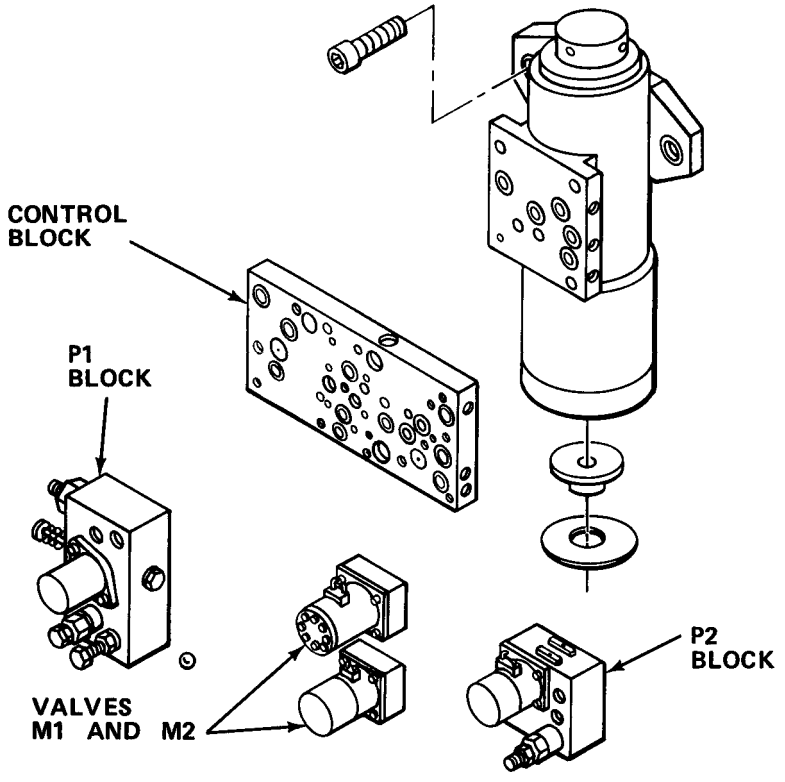
b. Remove front electronics enclosure cover.

c. Remove right pillar cover.

d. Remove bolts and hydraulic system cover plate.



e. Tag and disconnect three plug connectors. Carefully set aside. Do not allow connectors to fall into hydraulic reservoir.



f. Remove bolts and P1 block.

g. Remove bolts and P2 block.

h. Remove bolts and valve M1.

i. Remove bolts and valve M2.

j. Remove bolts and defective control block from clamp cylinder. Do not retain O-rings.

k. Remove pipes from defective control block and reinstall on new block. Use new copper washers.

l. Using new O-rings, install new control block onto clamp cylinder.

m. Using new O-rings, reinstall valve M2.

n. Using new O-rings, reinstall valve M1.

o. Using new O-rings, reinstall P2 block.

p. Using new O-rings, reinstall P1 block.

q. Reconnect electrical connectors.

r. Bleed the hydraulic system (paragraph 5-40.65).

5-40.23 Replace Clamp Cylinder.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS:
Flat Tip Screwdriver
8 mm Hex Head Socket Bit with 3/8 in. Drive
13 mm Socket with 3/8 in. Drive
3/8 in. Drive Ratchet
12 mm Hex Head Socket Bit with 1/2 in. Drive
1/2 in. Drive Ratchet
10 mm Combination Wrench
22 mm Combination Wrench
Fluid Evacuation Pump
Crow Bar

SUPPLIES:
Clamp Cylinder
O-Rings
Copper Washers
Clamp Base Spacers
Small 2 x 4 Block of Wood
Pail

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

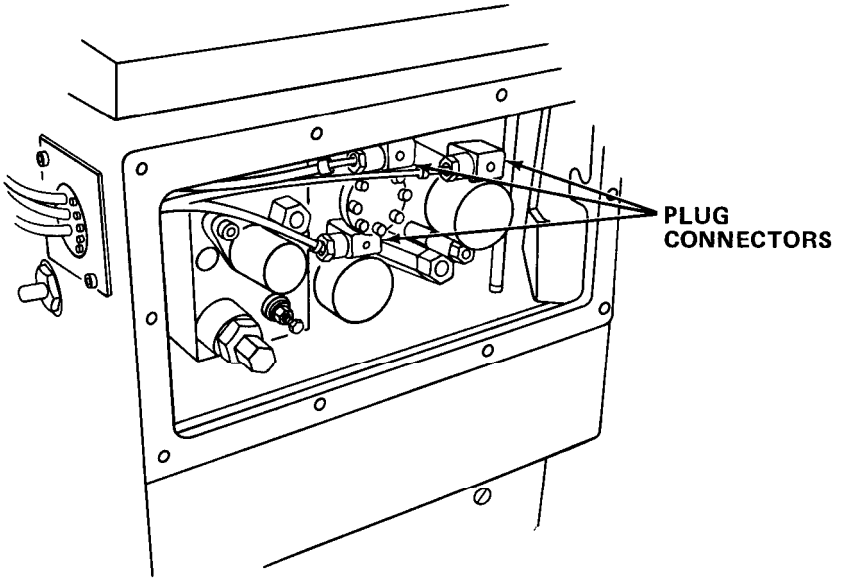
b. Remove front electronics enclosure cover.

c. Remove right pillar cover.

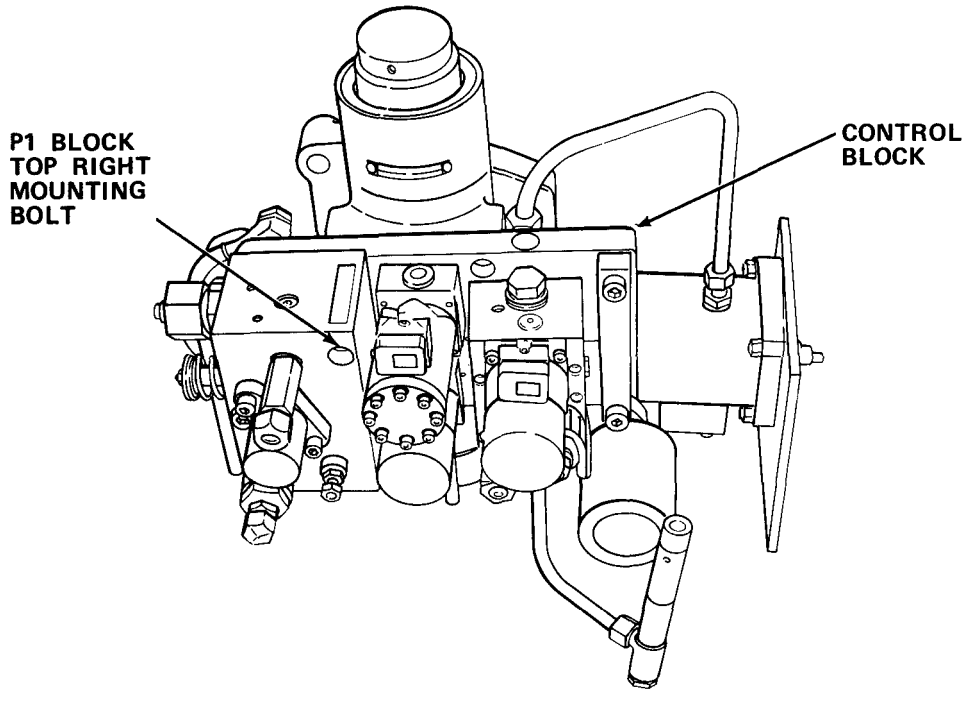
d. Remove main motor V-belt cover.

e. Remove bolts and hydraulic system cover plate.

f. Remove access cover above hydraulic pump.



g. Tag and disconnect plug connectors. Carefully set aside. Do not allow connectors to fall into hydraulic reservoir.



h. Disconnect all pipes from control block.

i. Remove top right mounting bolt for P1 block.

j. Remove remaining mounting bolts and control block with attached parts.

NOTE

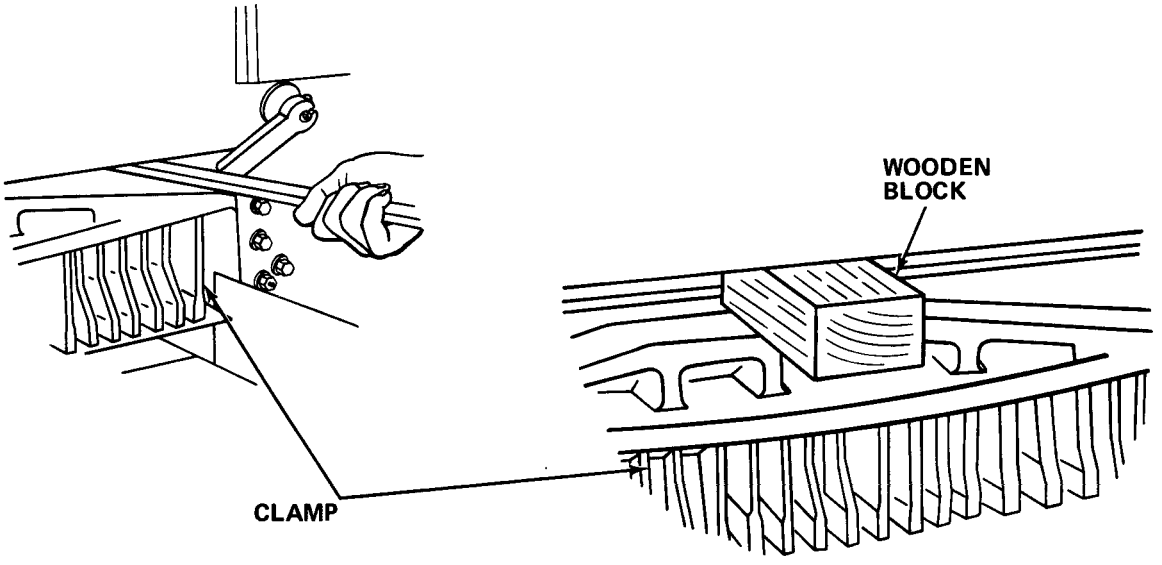
If hydraulic fluid is to be reused, be sure that pail is clean.

k. Pump all hydraulic fluid from the reservoir into pail.

NOTE

Piping contains copper washers. Do not allow washers to fall into hydraulic reservoir.

l. Disconnect all pipes from clamp cylinder.

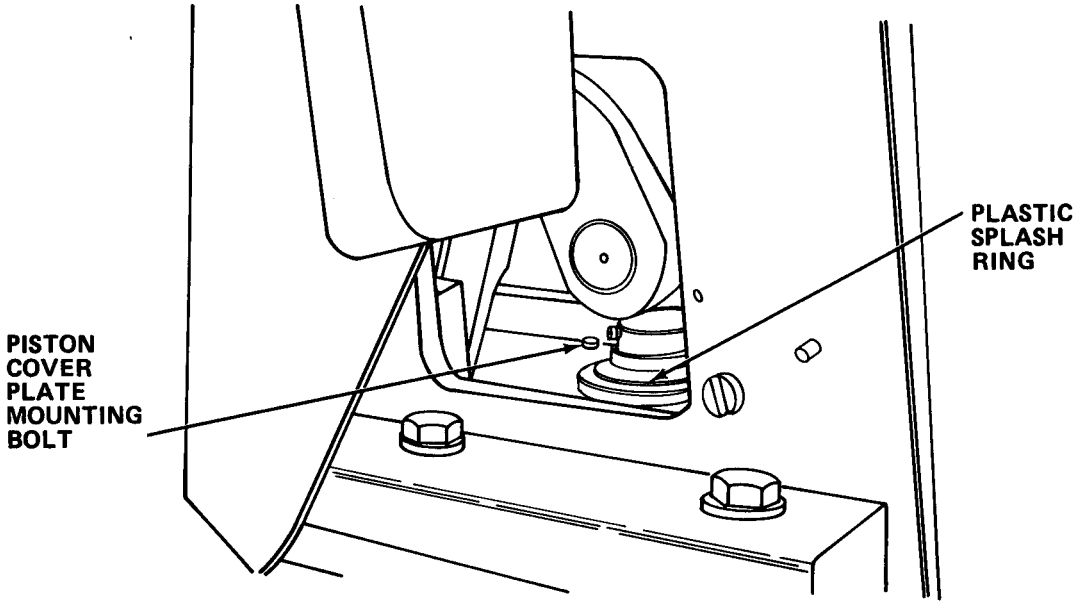


m. Using a crow bar, lower the clamp down as far as possible and insert a block of wood under it to hold it down.

n. Remove clamp piston cover plate.

NOTE

Splash ring is removed by pushing against collar with screwdriver from underneath clamp piston cover plate.



o. Remove plastic splash ring from clamp piston.

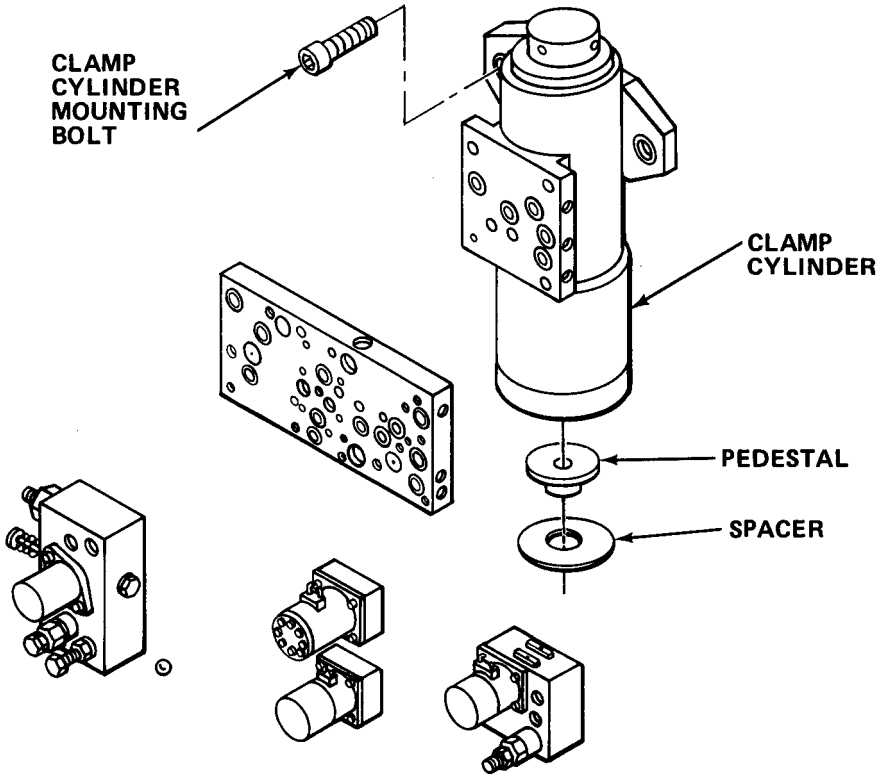
p. Remove piston cover plate mounting bolts. This allows cover to be freely moved.

q. Remove clamp cylinder mounting bolts.

NOTE

Alinement pin must be removed before clamp cylinder removal.

r. Remove alinement pin for control block.



NOTE

Clamp cylinder is heavy and difficult to move. Cylinder must be lowered, angled and moved sideways until it can be removed from hydraulic system access.

s. Remove defective clamp cylinder.

NOTE

Before tightening the clamp hydraulic cylinder to inner wall of the hydraulic reservoir, reinstall hydraulic cylinder and main drive gear clutch connecting pipe.

t. Install new cylinder into pillar and seat it onto pedestal.

u. Reinstall alinement pin.

v. If mounting holes do not aline with bolt holes, remove cylinder and insert spacers under pedestal and repeat steps t. and v. until holes aline.

NOTE

When reinstalling the piping for the clamp hydraulic cylinder, it will be necessary to loosen the hydraulic pump mounting plate to fit the pipe properly.

w. Reinstall clamp cylinder mounting bolts and tighten.

x. Reinstall piston cover plate mounting bolts and tighten.

y. Reinstall plastic splash ring around clamp piston.

z. Using crow bar, raise clamp and remove block of wood.

aa. Reconnect all pipes to clamp cylinder.

ab. Reinstall control block and secure with mounting bolts.

ac. Reconnect all pipes to control block.

ad. Reconnect electrical plug connectors.

ae. Reinstall access cover above hydraulic pump.

af. Reinstall main motor V-belt cover.

ag. Fill hydraulic reservoir with 17 liters (4.5 gallons) of hydraulic fluid. Observe sight glass for exact quantity required.

ah. Bleed hydraulic system (paragraph 5-40.65).

5-40.24 Replace Hydraulic Pump.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
13 mm Socket with 3/8 in. Drive
19 mm Socket with 3/8 in. Drive
3/8 in. Drive Ratchet
22 mm Combination Wrench
Fluid Evacuation Pump

SUPPLIES: Hydraulic Pump
Gasket
Copper Washers
O-Rings
Pail

WARNING

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

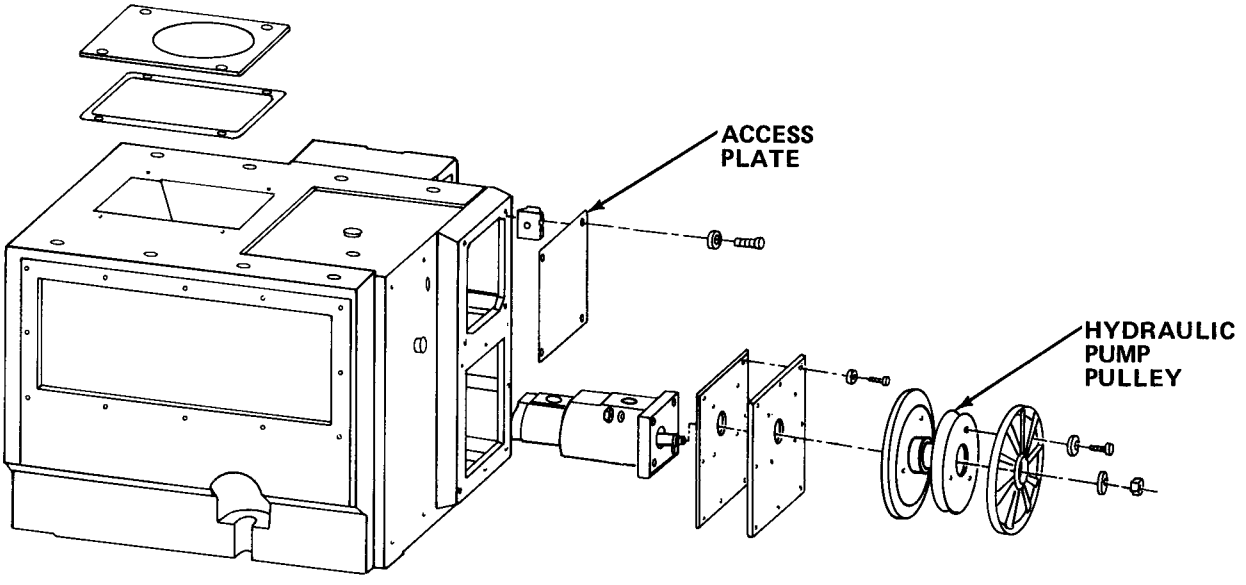
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove the main motor V-belt cover.



c. Remove the access plate above the hydraulic pump.

NOTE

If the hydraulic fluid is to be reused, be sure that the pail is clean before pumping fluid into it.

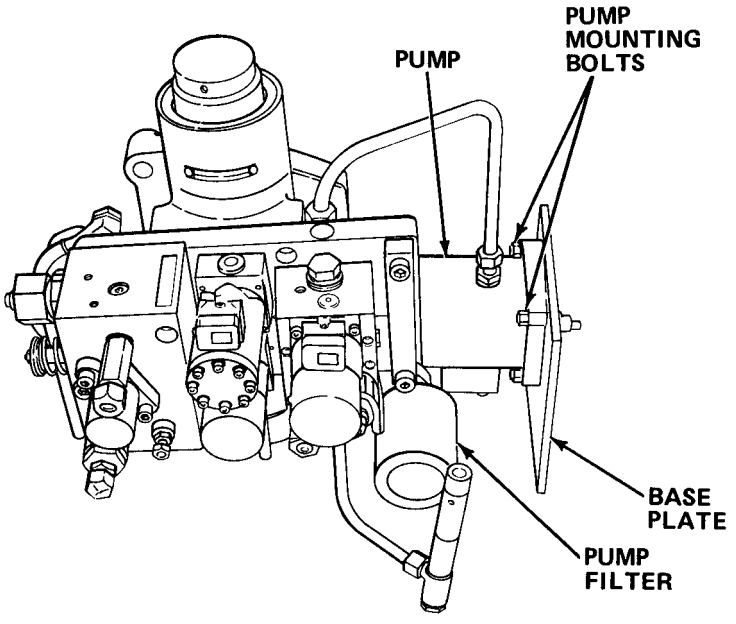
d. Using evacuation pump, pump all hydraulic fluid from the reservoir.

e. Remove the hydraulic pump V-belt (paragraph 5-36.4).

f. Remove the hydraulic pump pulley.

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).



g. Remove pump filter and pipes connected to pump. Clean filter with solvent and dry thoroughly.

h. Remove mounting bolts, plate and defective pump.

i. Remove base plate from bottom of defective pump. Do not retain O-rings.

j. Using new O-rings, install new pump onto base plate.

k. Using new gasket and copper washers, install new pump into reservoir.

l. Reinstall pump filter and reconnect pipes to pump.

m. Reinstall the hydraulic pump pulley.

n. Reinstall the main motor V-belt (paragraph 5-36.4).

o. Fill the reservoir with 17 liters (4.5 gallons) of hydraulic fluid.

p. Manually rotate the main motor to the right several times to lubricate the hydraulic fluid pump.

q. Reinstall the access plate above the pump.

r. Reinstall the main motor V-belt cover.

s. Bleed the hydraulic system (paragraph 5-40.65).

5-40.25 Service Hydraulic Fluid Filters.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
13 mm Socket with 3/8 in. Drive
3/8 in. Drive Ratchet
22 mm Combination Wrench

SUPPLIES: Small Fluid Filter
Large Fluid Filter

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

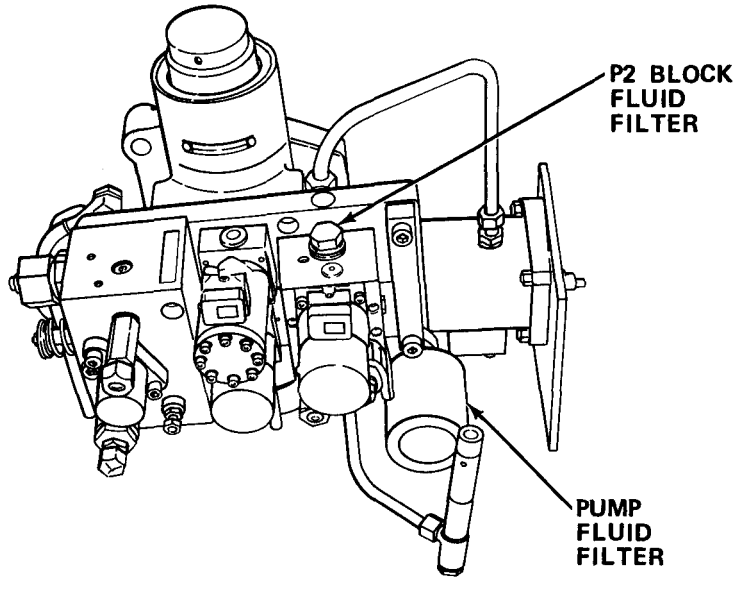
b. Remove main motor V-belt cover.

c. Remove front electronics enclosure cover.

d. Remove right pillar cover.

e. Remove hydraulic system cover plate.

f. Remove access plate above hydraulic pump pulley.



g. Remove contaminated fluid filter on top of P2 block.

h. Remove contaminated fluid filter on side of hydraulic pump.

i. Clean and install pump fluid filter.

j. Clean and install P2 block fluid filter.

k. Reinstall access plate cover above fluid pump pulley.

l. Reinstall main motor V-belt cover.

m. Reinstall hydraulic system cover plate.

n. Reinstall right pillar cover.

o. Reinstall front electronics enclosure cover.

p. Place operator key back into safety lock.

5-40.26 Replace Inch Valve Cable.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
6 mm Hex Head Key Wrench
10 mm Socket with 3/8 in. Drive
13 mm Socket with 3/8 in. Drive
3/8 in. Drive Ratchet
27 mm Combination Wrench
Wire Cutters

SUPPLIES: Inch Valve Cable
Wire Ties

WARNING

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

a. Turn off power.

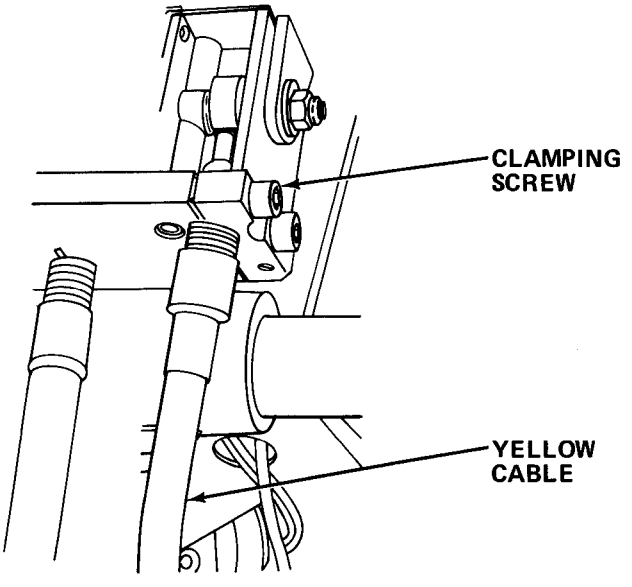
(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Turn off circuit breaker.

b. Remove main motor V-belt cover.

c. Remove screws and top cover.



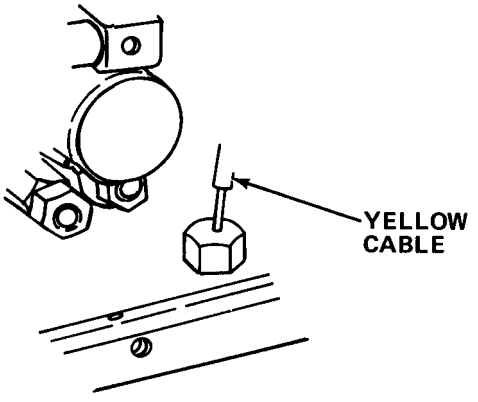
d. Remove the clamping screw for the yellow cable at the rear of the clamp pressure adjusting knob.

e. Pry open the clamp and remove the yellow cable from the clamp.

f. Remove front electronics enclosure cover.

g. Remove right pillar cover.

h. Remove hydraulic system cover plate.



i. Remove yellow cable from the top of the inch valve.

j. Remove clamp piston cover plate.

k. Remove cable holddown inside piston enclosure area.

l. Cut wire ties as necessary and remove defective yellow cable from frame.

m. Install new yellow cable into frame so that the top of the cable is near the clamp pressure adjusting knob, and the bottom is near the inch valve.

n. Install cable to inch valve.

o. Install cable into the clamp and tighten clamp down.

p. Reinstall cable holddown inside the clamp piston area.

q. Reinstall top cover.

r. Reinstall clamp piston cover plate.

s. Reinstall main motor V-belt cover.

t. Reinstall hydraulic system cover plate.

u. Reinstall right pillar cover.

v. Reinstall front electronics enclosure cover.

w. Turn on circuit breaker.

5-40.27 Replace Clamping Pressure Adjustment Cable.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
6 mm Hex Head Key Wrench
5 mm Hex Head Key Wrench
17 mm Combination Wrench
Wire Cutters

SUPPLIES: Cable
Wire Ties

WARNING

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

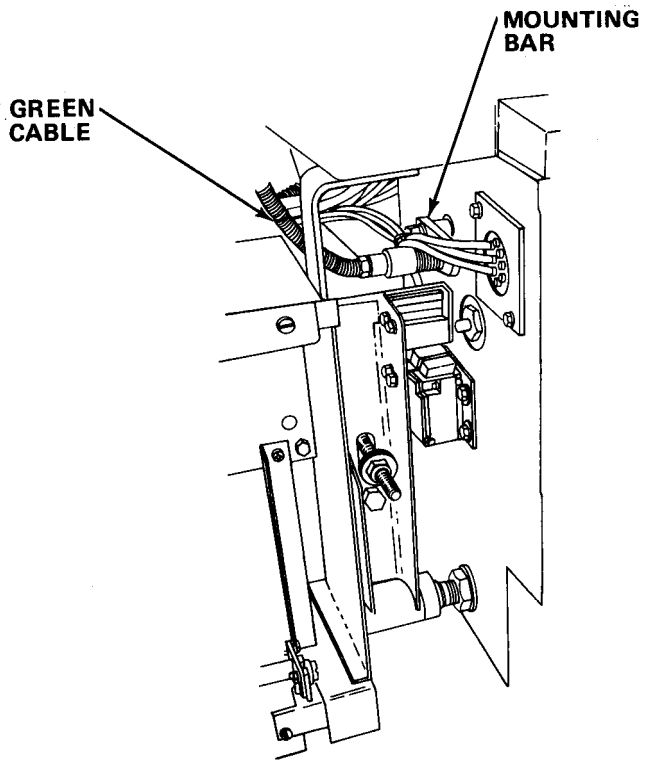
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Turn off circuit breaker.

b. Remove front and rear electronics enclosure covers.

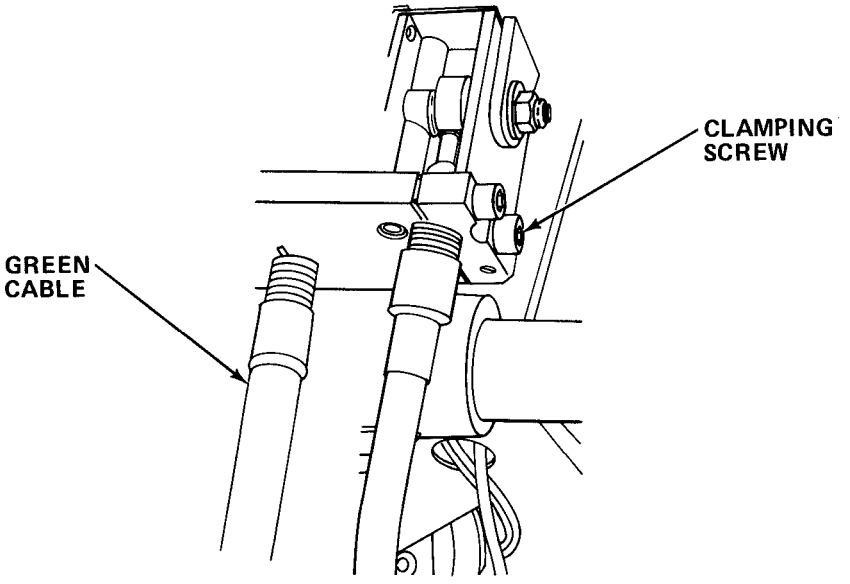


c. Remove mounting bar on which the green cable is attached.

d. Remove the green cable from the mounting bar.

e. Remove main drive motor V-belt cover.

f. Remove screws and washers for top cover and move top cover clear of side.



g. Remove the clamping screw for the green cable on the back of the clamp pressure adjusting knob.

h. Pry open the clamp and remove the green cable from the clamp.

i. Cut wire ties as necessary and pull the defective green cable out of the cutter.

j. Install new green cable into the clamp so that by rotating the clamp pressure adjusting knob the cable is activated from a minimum amount to a maximum amount.

k. Tighten clamp by reinstalling the clamping screw.

l. Feed cable down between the frames so that it exits the bottom left side of the right side and secure in place with wire ties.

m. Reinstall the top cover and secure with screws and washers.

n. Reinstall the main drive motor V-belt cover.

o. Reinstall the green cable onto the mounting bar so that most of the threads of the cable are on the side that enters the pillar.

p. Reinstall mounting bracket and secure with bolt.

q. Reinstall front and rear electronics enclosure covers.

r. Turn on circuit breaker.

s. Perform clamp pressure adjustment (paragraph 5-40.56).

5-40.28 Replace Circuit Boards IAR and/or AR

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Circuit Board IAR
Circuit Board AR

WARNING

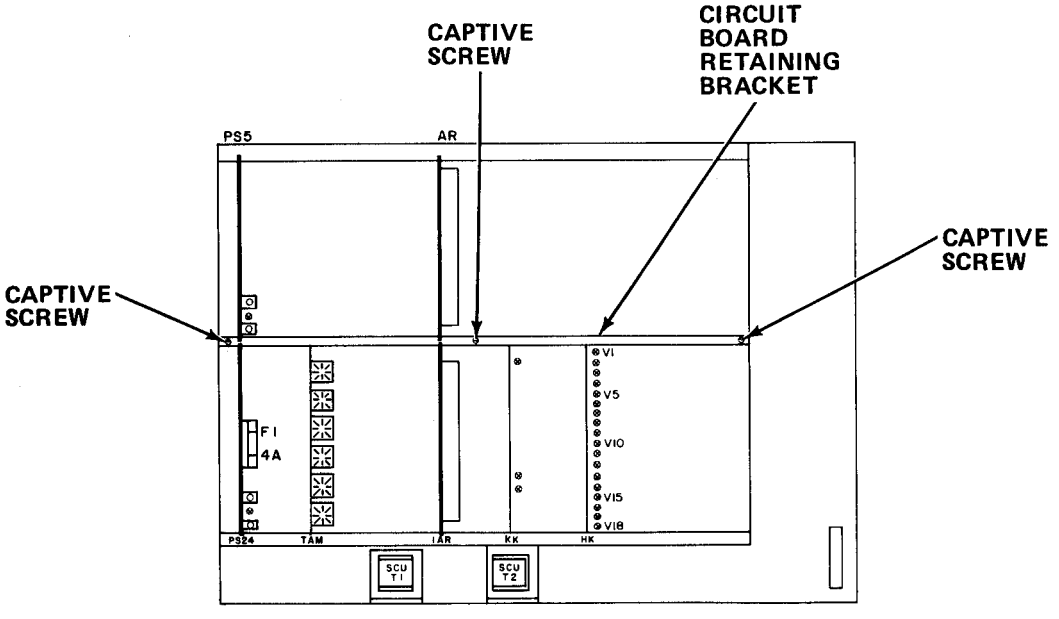
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.



b. Remove front electronics enclosure cover.

c. Loosen captive screws and remove circuit board retaining bracket.

d. Disconnect ribbon cable from defective circuit board.

e. Remove defective circuit board.

f. Using care, insert new circuit board into proper location and be sure circuit board is properly seated.

g. Reconnect ribbon cable to new circuit board.

h. Reinstall circuit board retaining bracket.

i. Reinstall front electronics enclosure cover.

j. Place operator key back into safety lock.

5-40.29 Replace Circuit Board ML.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: ML Circuit Board

WARNING

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

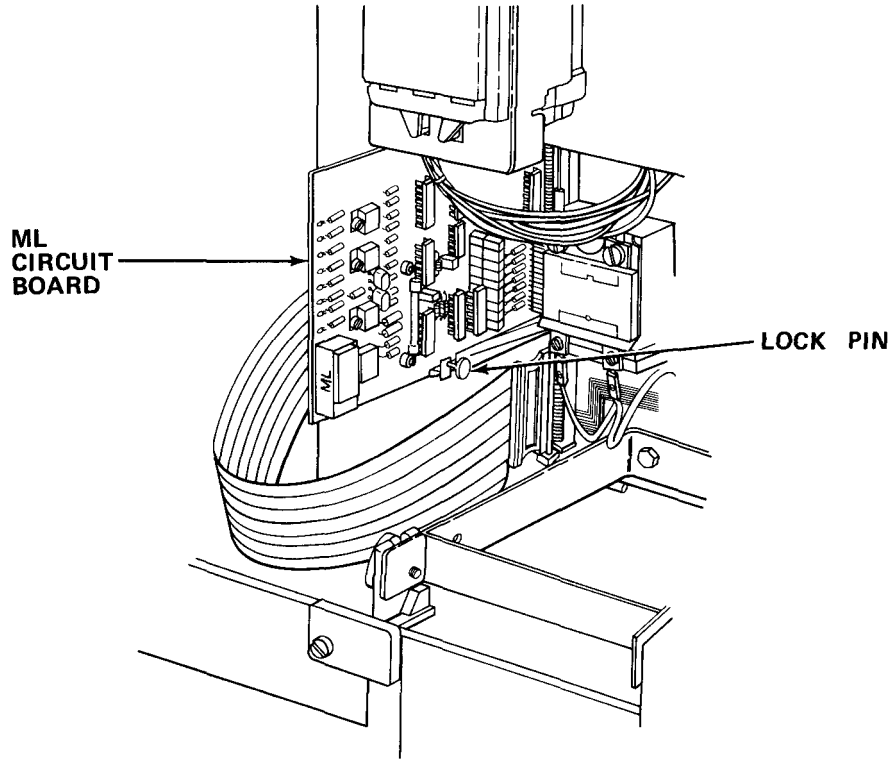
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove front electronics enclosure cover.



c. Locate the ML circuit board. Press the locks on the circuit board holder to the left.

d. Remove the defective circuit board.

e. Install new circuit board into its slot.

f. Press the locks on the circuit board holder to the right to lock the board in place.

g. Reinstall front electronics enclosure cover.

h. Place the operator key back into the safety lock.

5-40.30 Replace Circuit Board SDA

MOS: 35E, Special Electronic Devices Repairer

TOOLS: No. 1 Cross Tip Screwdriver
Flat Tip Screwdriver

SUPPLIES: Circuit Board SDA

WARNING

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

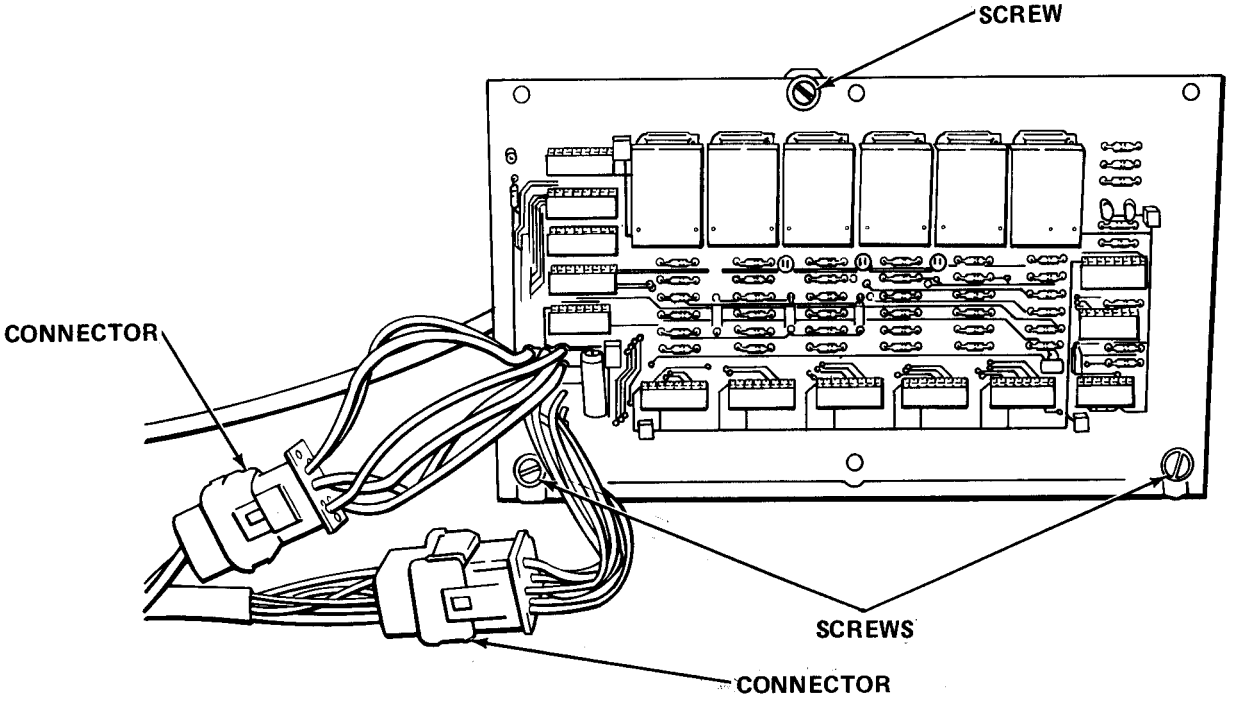
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove top front cover panel.



c. Press tabs on connectors and disconnect connector plugs (504 and 505).

d. Remove screws and defective SDA circuit board.

e. Install new SDA circuit board and secure with screws.

f. Reconnect connector plugs.

g. Reinstall top front cover panel.

h. Place operator key back into safety lock.

5-40.31 Replace Circuit Boards HK, KK, PS5, PS24, and TAM

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Circuit Board HK
Circuit Board KK
Circuit Board PS5
Circuit Board PS24
Circuit Board TAM

WARNING

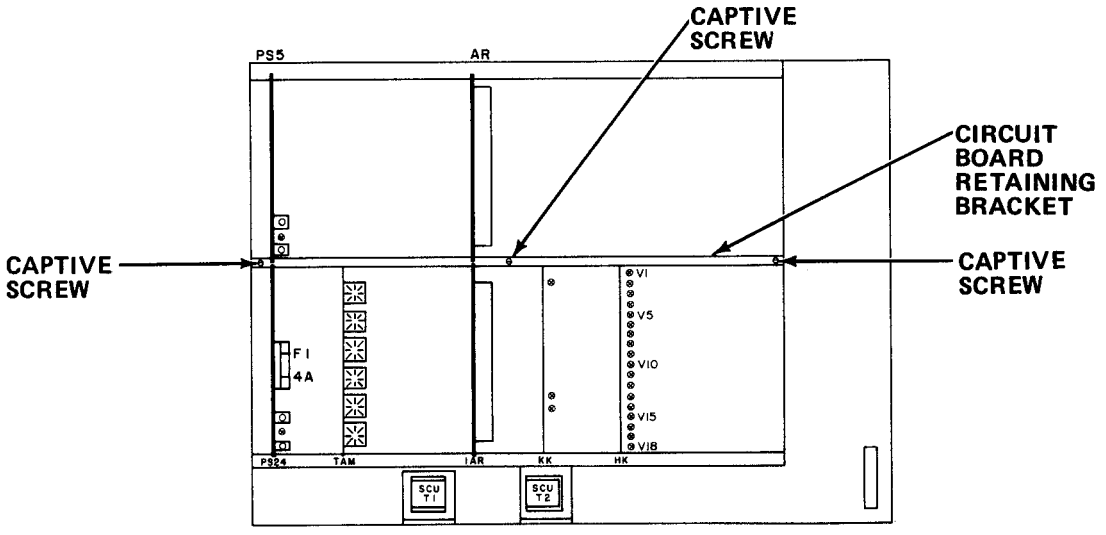
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.



b. Remove front electronics enclosure cover.

c. Loosen captive screws and remove circuit board retaining bracket.

d. Remove defective circuit board.

NOTE

- If PS5 or PS24 circuits are replaced, it will be necessary to perform power supply adjustments (paragraph 5-40.63).
- If TAM circuit board is replaced, it will be necessary to perform measurement display adjustment (paragraph 5-40.60).

e. Using care, install new circuit board into proper location, and be sure circuit board is properly seated.

f. Reinstall circuit board retaining bracket.

g. Reinstall front electronics enclosure cover.

h. Place operator key back into safety lock.

5-40.32 Replace SCU to MC Ribbon Cable.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Ribbon Cable

WARNING

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

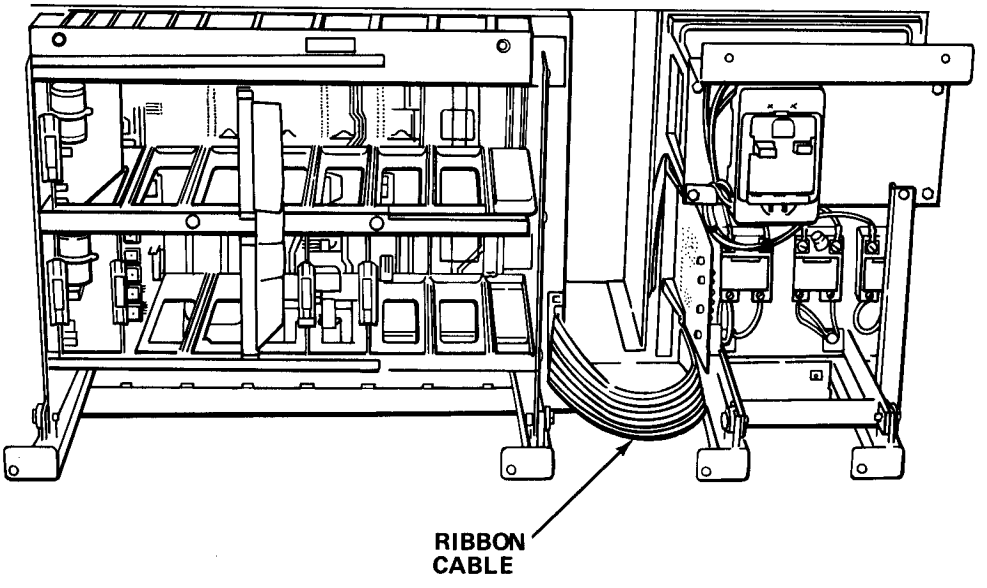
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove front electronics enclosure cover.



c. Turn tabs at both ends of ribbon cable 180 degrees and remove defective ribbon cable.

d. Install new ribbon cable and secure in place by turning locking tabs into place.

e. Reinstall front electronics enclosure cover.

f. Place operator key back into safety lock.

5-40.33 Replace IAR to AR Ribbon Cable.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Ribbon Cable

WARNING

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

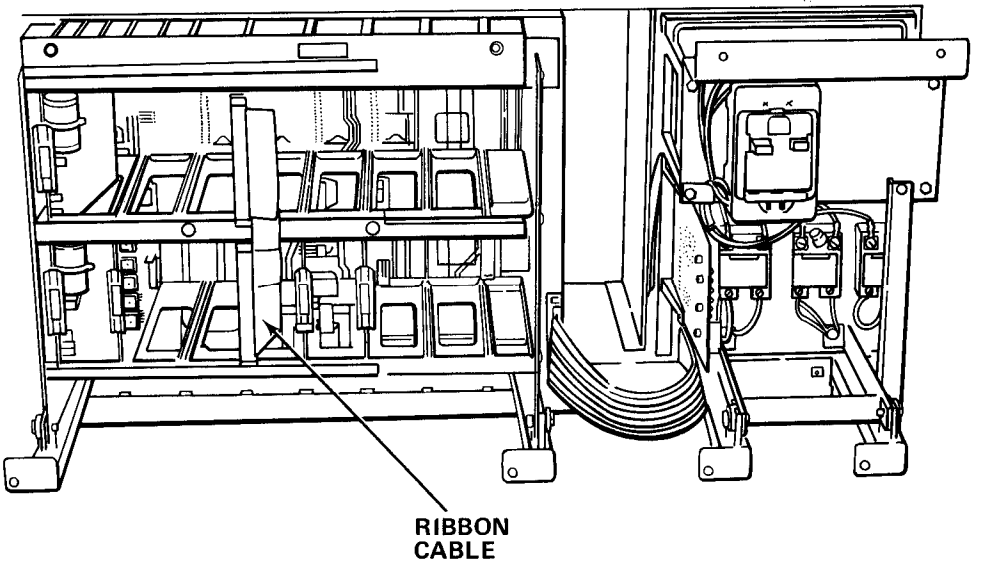
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove front electronics enclosure cover.



c. Remove the defective ribbon cable from both circuit boards.

d. Install new ribbon cable onto both circuit boards.

e. Reinstall front electronics enclosure cover.

f. Place operator key back into safety lock.

5-40.34 Replace SCU Motherboard.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
No. 2 Cross Tip Screwdriver
5 mm Hex Head Key Wrench

SUPPLIES: SCU Motherboard

WARNING

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

a. Turn off power.

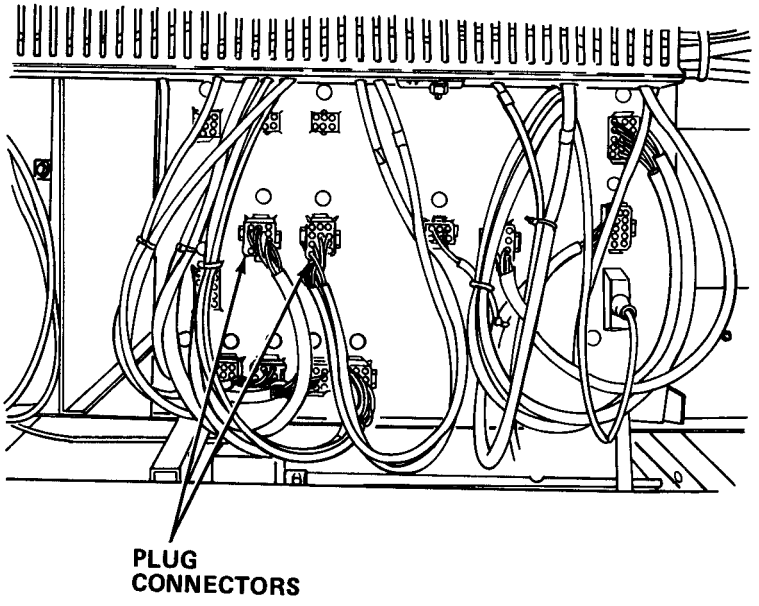
(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

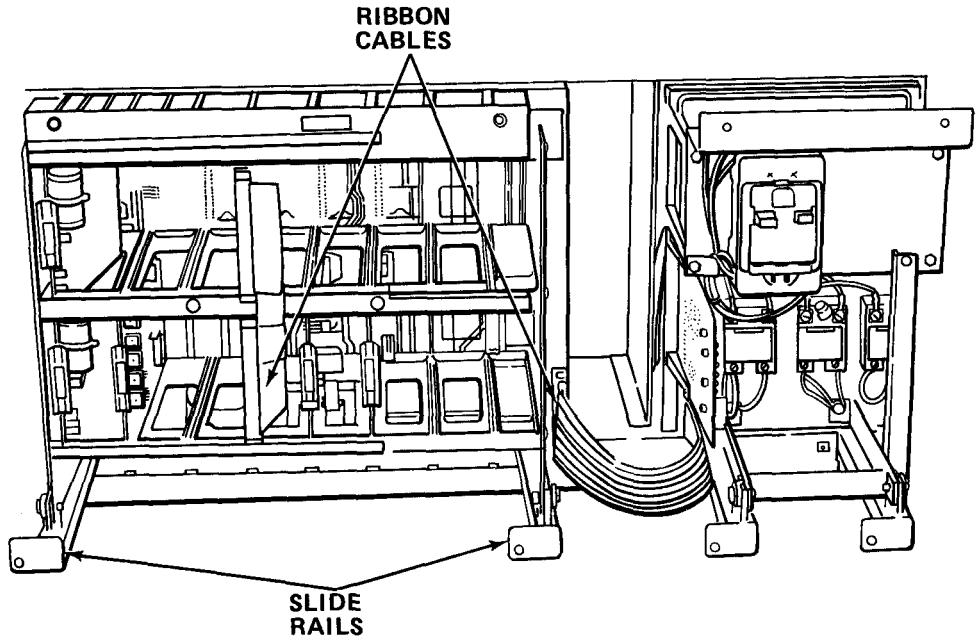
b. Remove front electronics enclosure cover.

c. Remove ribbon cable going to MC unit by turning locking tabs and carefully pulling cable from SCU.



d. Remove rear electronics enclosure cover.

e. Tag and disconnect all plug connectors on back of SCU motherboard.



f. Remove ribbon cable between IAR circuit board and AR circuit board by pulling straight out.

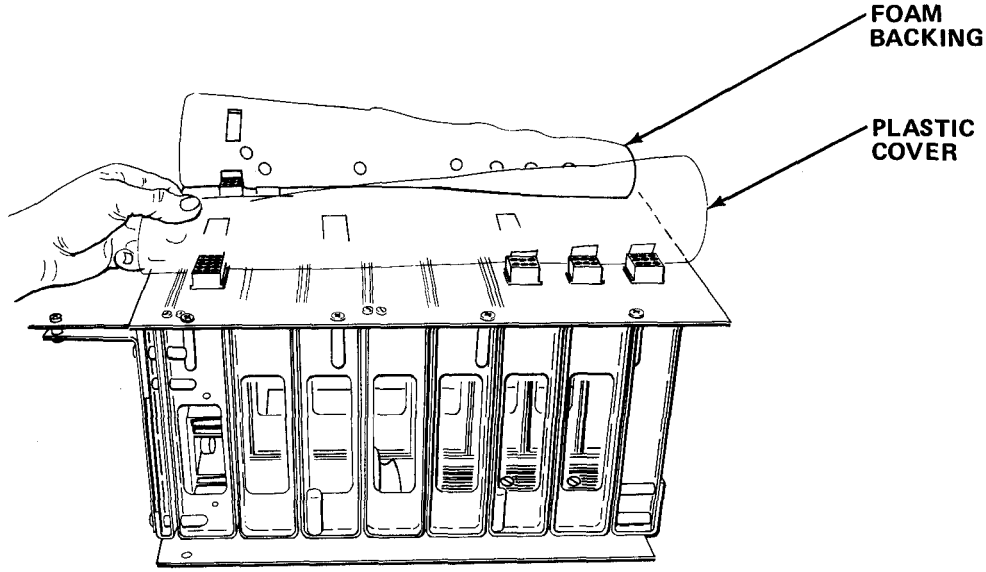
g. Loosen captive screws and remove circuit board retaining bracket.

h. Remove all circuit boards from the SCU unit, noting location of each.

i. Remove retaining screws from top front of SCU unit.

j. Remove slide rail retaining screws from bottom of SCU unit.

k. Slide out SCU unit and tilt forward.



l. Remove foam backing and plastic cover from SCU motherboard.

m. Remove twelve cross tip retaining screws and defective SCU motherboard.

n. Install new SCU motherboard and secure with screws.

o. Reinstall plastic cover and foam backing onto new SCU motherboard.

p. Tilt SCU upright and slide into paper cutter. Retain with slide rail retaining screws and top front retaining screws.

q. Reinstall circuit boards into their proper locations.

r. Reinstall circuit board retaining bracket and secure with screws.

s. Reconnect ribbon cable between IAR and AR circuit boards.

t. Reconnect all plug connectors to new SCU motherboard.

u. Reinstall the rear electronics enclosure cover.

v. Reconnect ribbon cable between MC unit and SCU. Lock in place with tabs.

w. Reinstall front electronics enclosure cover.

x. Place operator key back into the safety lock.

5-40.35 Replace MC Unit Motherboard.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
7 mm Socket with 1/4 in. Drive
8 mm Socket with 1/4 in. Drive
10 mm Socket with 1/4 in. Drive
Handle, Socket Wrench, 1/4 in. Drive
Needle Nose Pliers

SUPPLIES: MC Unit Motherboard

WARNING

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

a. Turn off power.

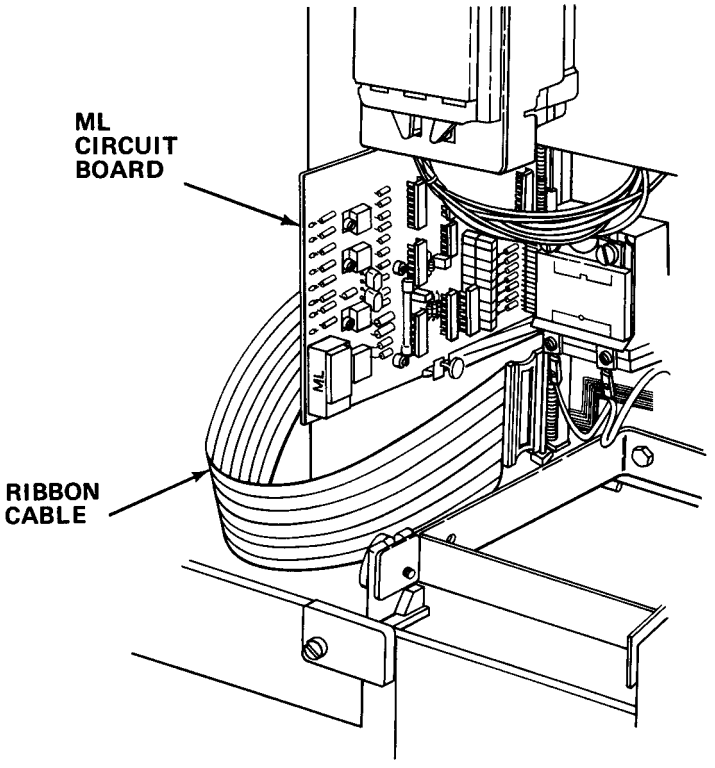
(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

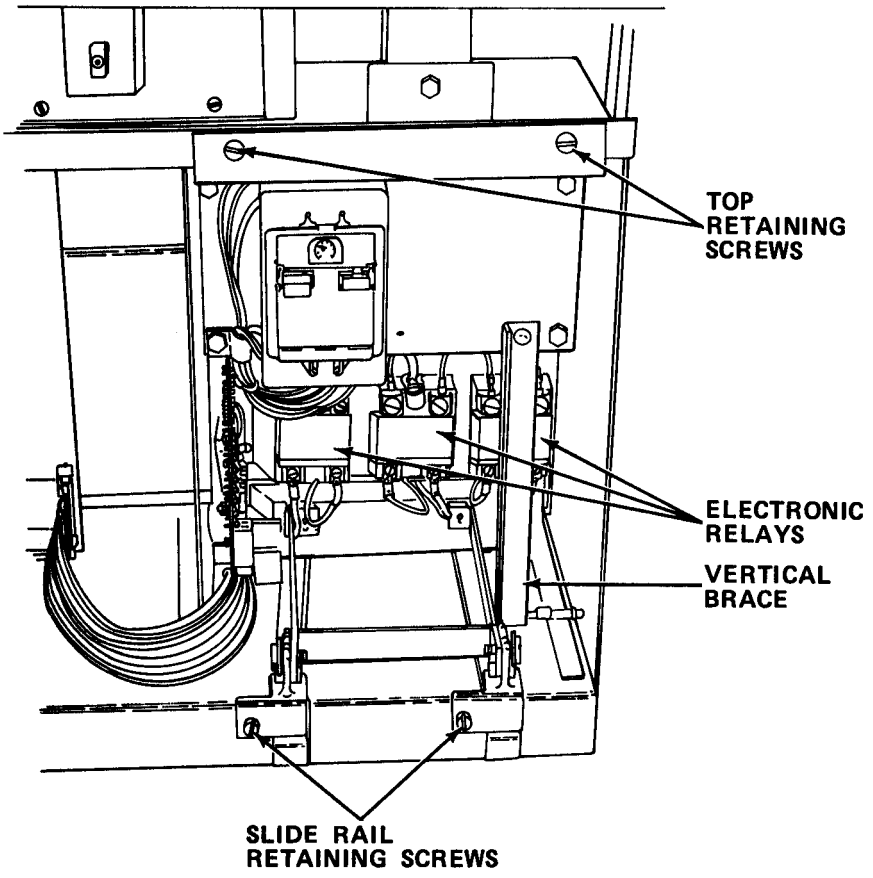
(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove front electronics enclosure cover.

c. Remove ribbon cable to SCU unit by turning locking tabs and pulling cable from MC unit.



d. Remove ML circuit board by pressing circuit board locking pins to the left and carefully remove ML circuit board.



e. Remove top front retaining screws from MC unit.

f. Remove slide rail retaining screws and slide out MC unit.

g. Tag and disconnect all electronic relay wiring.

h. Remove bottom screw from vertical brace and move brace aside.

i. Remove electronic relay mounting screws and remove relays and heat sink.

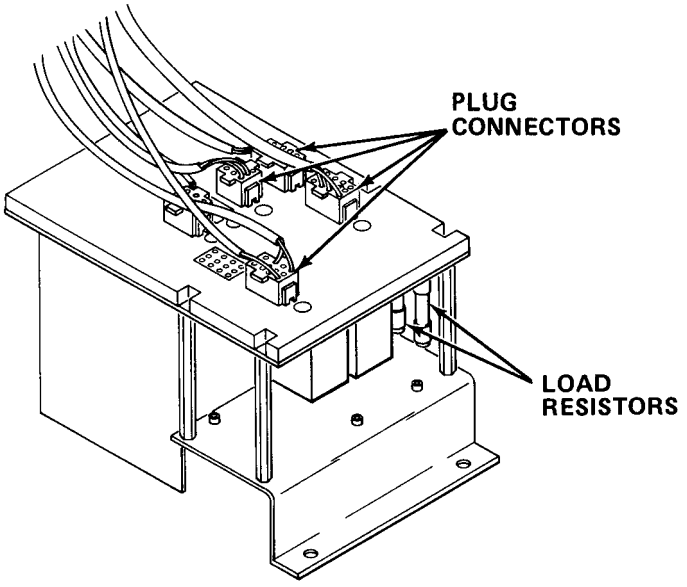
NOTE

Motherboard assembly is heavy, and brace must be temporarily reinstalled to support weight.

j. Reinstall vertical brace.

k. Tag and disconnect front plug connector.

l. Tag and disconnect wires from backgauge load resistors.



m. Tilt MC unit forward, tag and disconnect all plug connectors.

n. Remove retaining bolts and nuts from backgauge load resistors and remove resistors.

o. Remove nuts and electronic relay studs.

p. Remove six remaining mounting nuts and separate defective MC unit motherboard from overload relay brace.

q. Install new MC unit motherboard onto overload relay brace and secure with retaining nuts.

r. Reinstall studs for electronic relays and secure with nuts.

s. Reinstall backgauge load resistors and secure with nuts.

t. Reconnect all plug connectors on back of MC unit motherboard and tilt MC unit to its upright position.

u. Reconnect wiring for backgauge load resistors.

v. Reconnect front plug connector.

w. Reinstall electronic relays and heat sink; secure with screws and nuts.

x. Reconnect electronic relay wiring.

y. Slide MC unit into paper cutter and secure slide rails with screws.

z. Secure MC unit in place with top retaining screws.

aa. Carefully install ML circuit board and secure in place with locking pins.

ab. Reconnect ribbon cable to MC unit and lock in place with locking tabs.

ac. Reinstall front electronics enclosure cover.

ad. Place operator key back into safety lock.

5-40.36 Replace MC Unit Electronic Relays

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
7 mm Nut Driver

SUPPLIES: Electronic Relay

WARNING

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

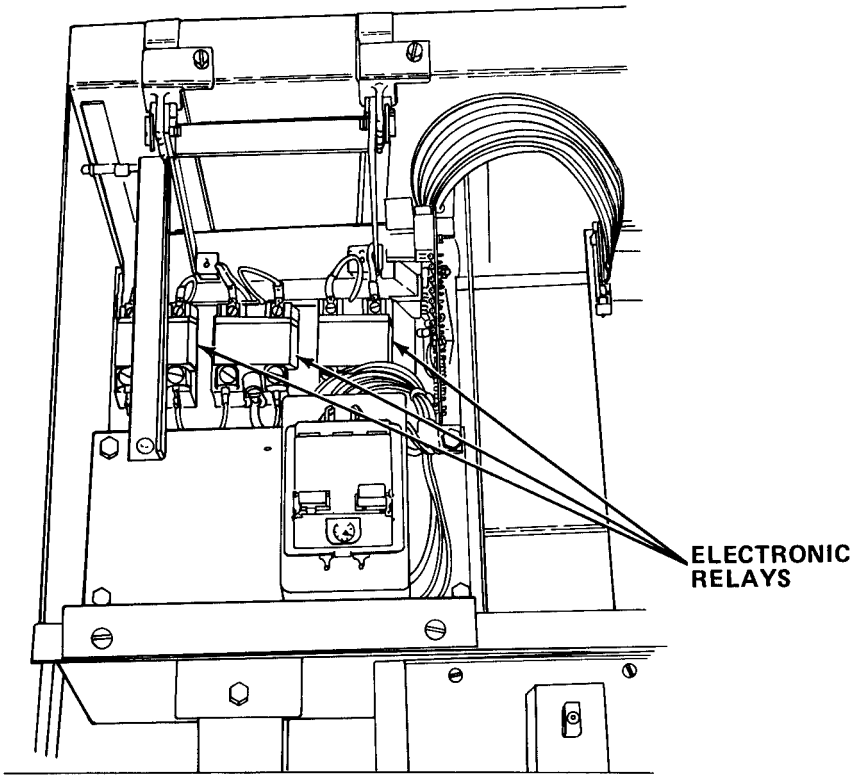
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove front electronics enclosure cover.



c. Tag and disconnect wiring from defective relay.

d. Remove mounting screws/bolts and defective relay.

e. Install new relay and secure with screws/bolts.

f. Reconnect wiring.

g. Reinstall front electronics enclosure cover.

h. Place operator key back into safety lock.

5-40.37 Replace Backgauge Brake.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdrivers
4 mm Hex Head Key Wrench
Metric Feeler Gages (.15 - .25 mm)

SUPPLIES: Backgauge Brake

WARNING

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

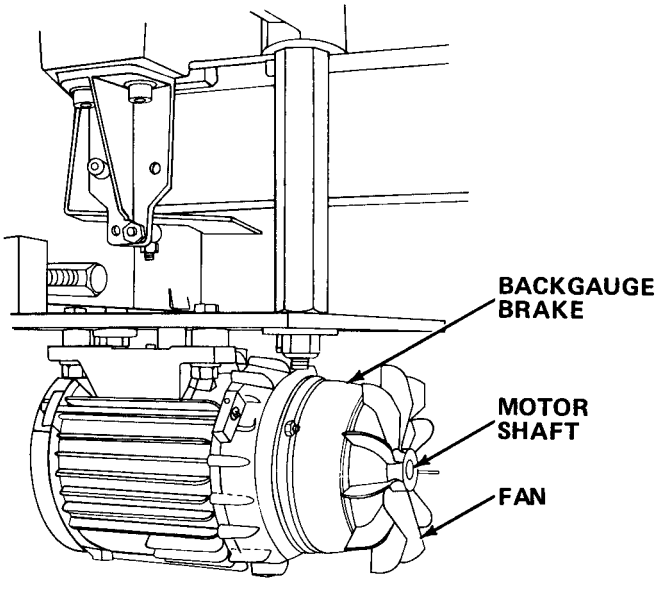
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to I position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove the cover from the backgauge brake.



c. Remove the fan from motor shaft by pulling straight out.

d. Remove the motor junction box cover.

e. Tag and disconnect wires from backgauge brake.

f. Remove mounting screws and defective backgauge brake.

g. Install new backgauge brake and secure with mounting screws.

h. Reconnect brake wires.

i. Reinstall motor junction box cover.

j. Turn on power.

(1) Place operator key in safety lock and unlock safety lock.

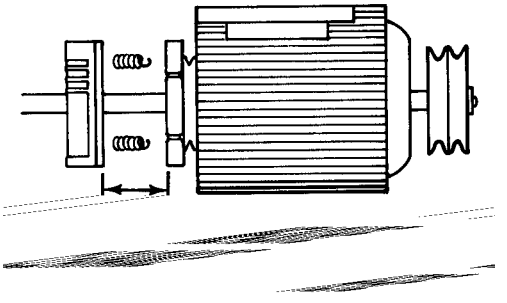
(2) Turn main power switch to I position.

(3) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn to △ position.

k. Trip the backgauge overload relay by pressing in on the O switch on the relay.

l. Press in on the backgauge control knob button.

m. Check for a clearance of .15 - 2.5 mm (.006 - 0.1 in.) between the friction plate and the brake when the brake is disengaged. If clearance correct, proceed to step o.



n. If gap is incorrect, adjust gap by loosening locking nuts and readjusting friction disc clearance using mounting bolts.

o. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

p. Push the fan on the motor shaft.

q. Reinstall backgauge brake cover.

r. Reset the backgauge overload relay by pressing the I button.

5-40.38 Replace Backgauge Control Switches.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Switch

WARNING

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

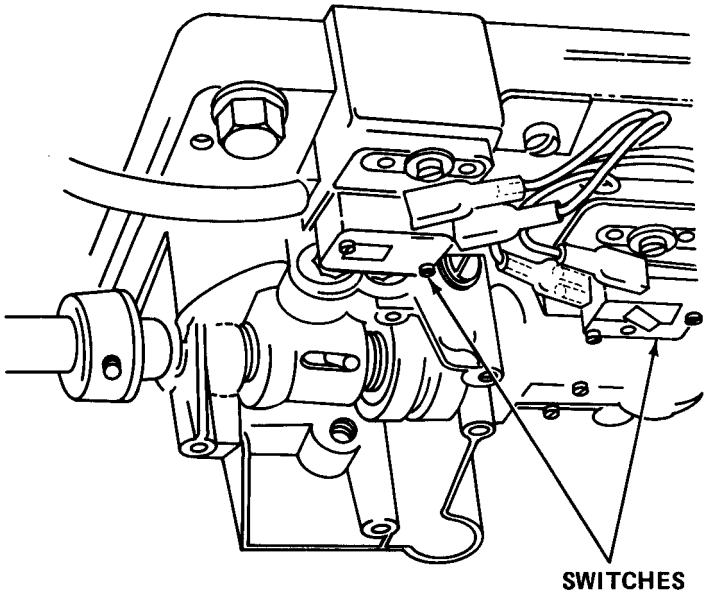
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove backgauge control switches cover.



c. Tag and disconnect wires from defective switch.

d. Remove screws holding switch in place and remove defective switch and spacer board.

e. Install new switch and spacer board but do not tighten screws.

f. Adjust switch by moving appropriate knob control in or out the maximum distance. Then move switch until nylon cam activates switch. Tighten switch mounting screws.

g. Reconnect wires.

h. Reinstall backgauge control switch cover.

i. Place operator key back into safety lock.

5-40.39 Replace Backgauge Limit Switches.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
No. 2 Cross Tip Screwdriver

SUPPLIES: Switch

WARNING

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

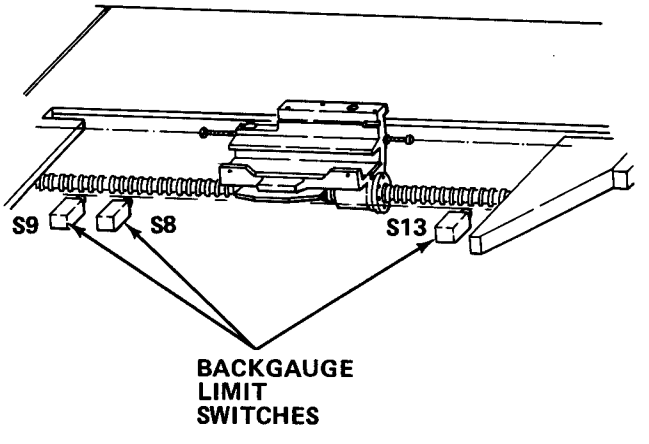
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove oil drip pans under backgauge table.



c. Loosen captive screw on the cover of the defective switch and lower the cover.

d. Tag and disconnect wires from defective switch.

e. Remove retaining screws and defective switch.

f. Install new switch and loosely secure with retaining screws.

g. Reconnect wiring.

h. Close cover and secure with captive screw.

i. Perform backgauge limit switch adjustment for new switch (paragraph 5-36.17).

5-40.40 Replace Linear Scale Measurement Device.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench

SUPPLIES: Linear Scale Measurement Device

WARNING

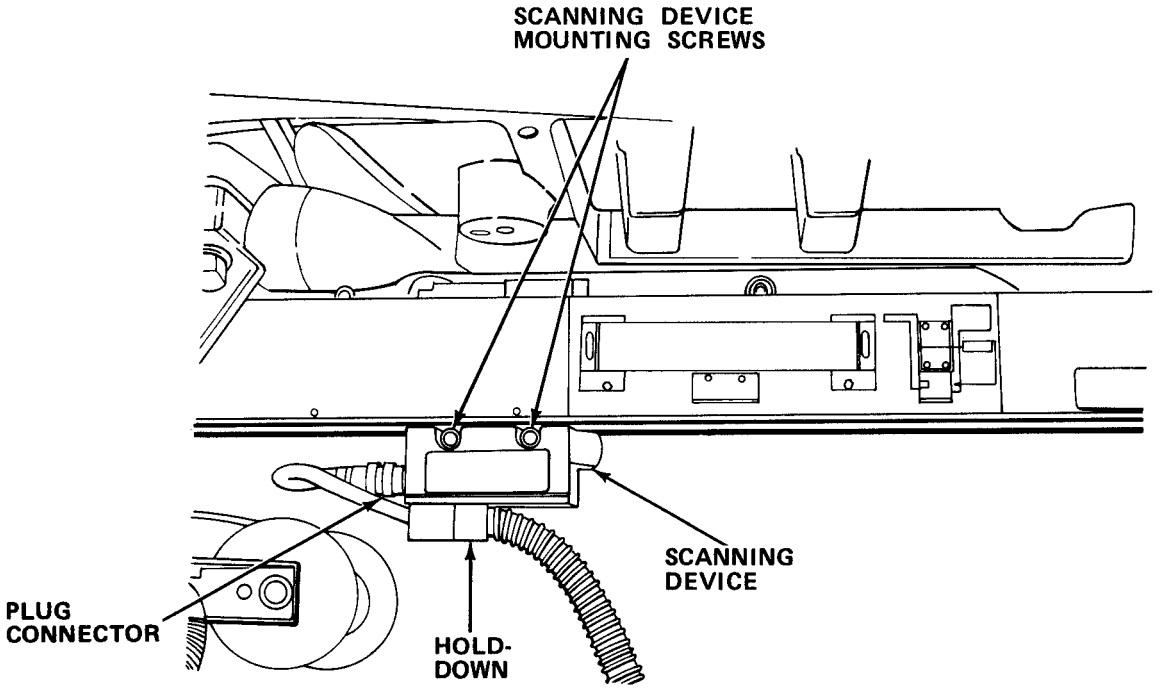
Death or serious injury may occur from electrical shock unless power is turned off before servicing.

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.



b. Remove plug connector and holddown on scanning device.

c. Remove scanning device mounting screws from sledge.

d. Remove linear scale mounting bolts and defective linear scale measurement device.

e. Install new linear scale measurement device and secure with mounting bolts.

f. Mount scanning device to sledge and retain with screws.

g. Reconnect plug connector and cable holddown.

h. Place operator key back into safety lock.

i. Perform measurement display adjustment (paragraph 5-40.60).

5-40.41 Replace Clamp Foot Pedal Switch

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
10 mm Combination Wrench
5 mm Hex Head Key Wrench
No. 2 Cross Tip Screwdriver
Wire Cutters

SUPPLIES: Switch (S309)
Wire Ties

WARNING

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

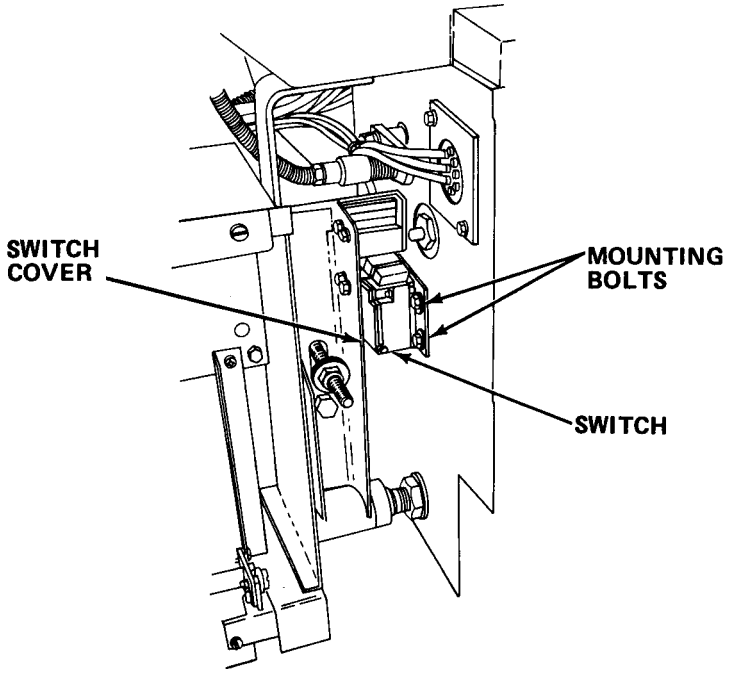
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove rear electronics enclosure cover.



c. Remove mounting bolts on switch mounting plate.

d. Cut wire ties as necessary to move switch out enough to have easy access to wiring.

e. Loosen captive screw on switch cover and lower cover.

f. Tag and disconnect wiring.

g. Remove switch mounting screws and defective switch.

h. Install new switch and secure with mounting screws.

i. Reconnect wires and close switch cover and secure with screw.

j. Reinstall switch mounting plate to frame and secure with bolts.

k. Install new wire ties.

l. Place operator key back into safety lock.

m. Perform clamp foot pedal adjustments (paragraph 5-36.18).

n. Reinstall rear electronics enclosure cover.

5-40.42 Replace Clamp Proximity Switch.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
10 mm Combination Wrench
24 mm Combination Wrench
No. 2 Cross Tip Screwdriver
10 mm Socket with 3/8 in. Drive
3/8 in. Drive Ratchet
Wire Cutters
12 in. Adjustable Wrench

SUPPLIES: Proximity Switch (b29)
Wire Ties

WARNING

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

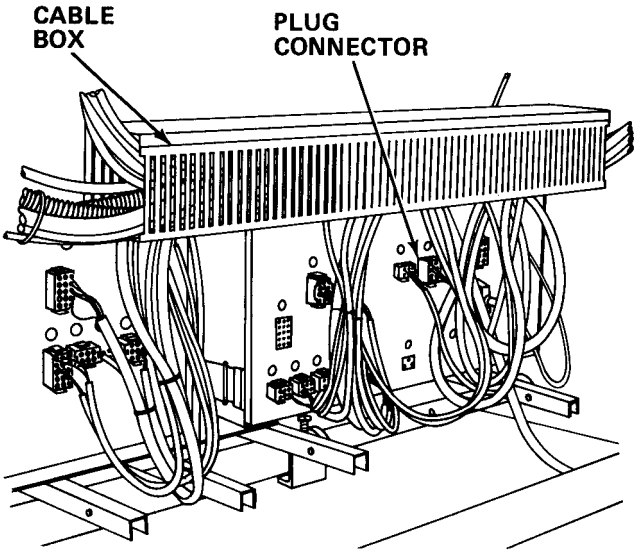
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

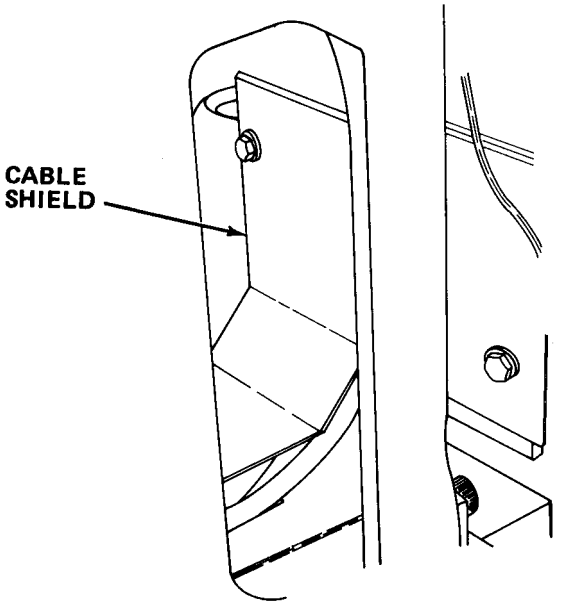
b. Remove rear electronics enclosure cover.



c. Disconnect plug connector 11 from SCU.

d. Remove cover on cable box and remove cable 11 from box, cutting wire ties as necessary.

e. Remove left side of top cover.



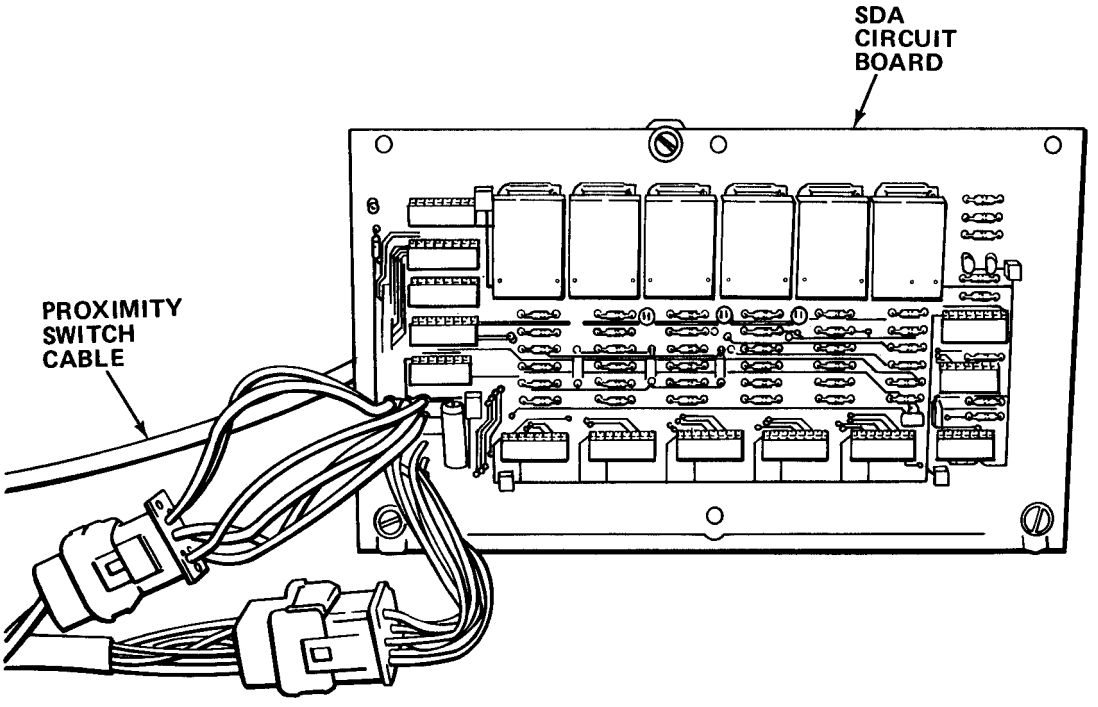
f. Remove cable shield.

g. Remove power supply cover.

h. Remove two retaining screws from bottom front of PM unit, and slide unit from left pillar.

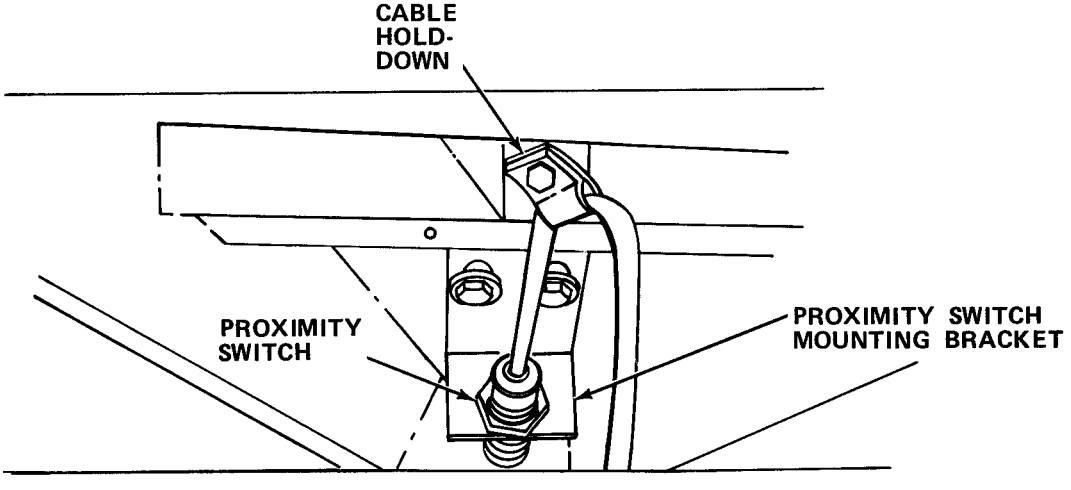
i. Remove drip plate from inside pillar.

j. Remove top front cover plate and pull cable up and through opening.



k. Remove SDA circuit board to gain access to cable holddown.

l. Remove cable holddown and pull cable through opening.



m. Remove cable holddown between frames above proximity switch.

n. Remove proximity switch mounting bracket.

o. Remove defective proximity switch from mounting bracket.

p. Install new proximity switch on mounting bracket.

q. Reinstall proximity switch and mounting bracket on cutter frame.

r. Reinstall cable holddown and secure with bolt.

s. Pull cable through front frame opening and secure in place with cable holddown and bolt.

t. Reinstall SDA circuit board and secure with screws.

u. Push cable through left side opening and then reinstall top front cover plate.

v. Carefully push and pull cable down and through left side frame so that cable is through the bottom opening of frame nearest SCU.

w. Reinstall cable shield.

x. Reinstall drip plate.

y. Slide in PM unit and secure with top screws.

z. Reinstall power supply cover.

aa. Reinstall excess cable in cable box and group cables together with wire ties.

ab. Reinstall cover on cable box .

ac. Reconnect plug connector 11 on SCU.

ad. Reinstall rear electronics enclosure cover.

ae. Place operator key back into safety lock.

af. Perform clamp proximity switch adjustments (paragraph 5-40.49).

5-40.43 Replace False Clamp Switch.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench
No. 2 Cross Tip Screwdriver

SUPPLIES: Switch (S6)

WARNING

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

a. Turn off power.

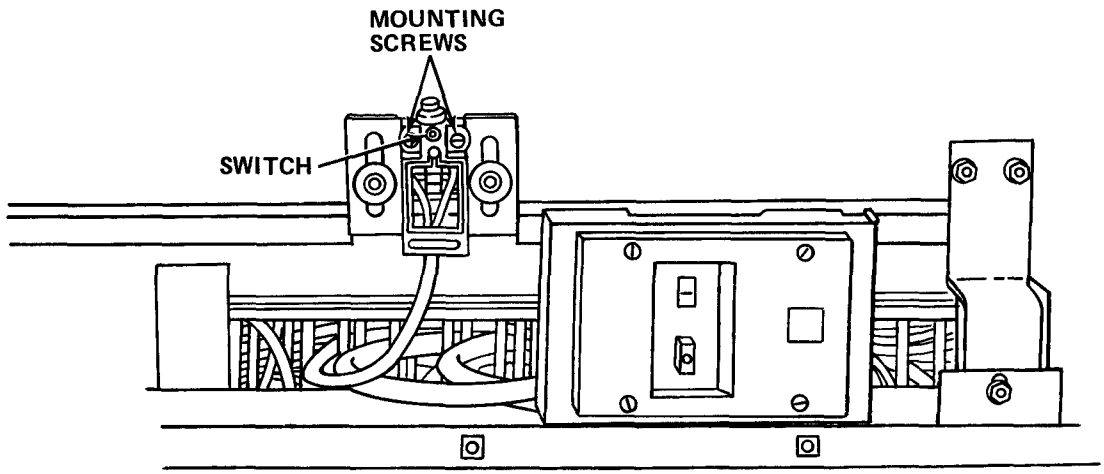
(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove front electronics enclosure cover.

c. Loosen captive screw on switch cover and lower cover.



d. Tag and disconnect wiring from defective switch.

e. Remove mounting screws and defective switch.

f. Install new switch and secure with screws.

g. Reconnect wiring and close switch cover, securing with screw.

h. Perform adjustment for false clamp switch (paragraph 5-33.3, step h).

i. Reinstall front electronics enclosure cover.

j. Place operator key back into safety lock.

5-40.44 Replace Connecting Rod Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
Ball Peen Hammer
Pin Punch
Two 32 mm Combination Wrenches
19 mm Socket with 3/8 in. Drive
3/8 in. Drive Ratchet
19 mm Combination Wrench
Pry Bar

SUPPLIES: Connecting Rod Assembly.

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove the main motor V-belt cover.

c. Remove main power switch knob.

d. Install main power switch knob onto shaft of clutch plate.

e. Rotate knob to the right to uncover the clutch override holes.

f. Insert the reset handles into the override holes and rotate to the right until the threads engage. Tighten handles.

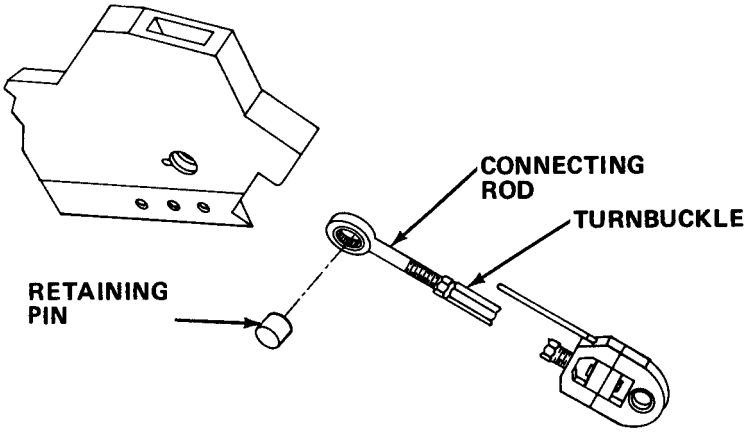
NOTE

It may be necessary to remove the safety bolt cover and hold the safety bolt back to move the knife through its movement.

g. Rotate handles and main drive gear to the right until the carrier is in a position so that the connecting rod pin is just clear of the frame, (looking from the rear of the machine).

h. Remove eccentric cover.

i. Remove shear bolt.



j. Turn the turnbuckle so the connecting rod becomes shorter.

k. Remove connecting rod alinement rod.

l. Remove the retaining tab on the connecting rod pin, and knock out the retaining pin.

m. Remove the upper portion of the defective connecting rod.

n. Remove the retaining nut and pry off the lower portion of the defective connecting rod from the eccentric.

o. Install the lower portion of the new connecting rod onto the eccentric and secure with nut.

p. Install the upper portion of the new connecting rod into the carrier and insert the pin.

q. Reinstall connecting rod alinement rod.

r. Reinstall the retaining tab.

s. Turn the turnbuckle so that the two connecting rod halves are alined.

t. Reinstall the shear bolt.

u. Manually position the knife to its uppermost position.

v. Reinstall the eccentric cover.

w. Remove reset handles.

x. Rotate clutch plate to the left to cover the override holes.

y. Remove main power switch knob and reinstall it onto the control panel.

z. Reinstall the main motor V-belt cover.

aa. Perform knife replacement procedure to readjust all carrier adjustments (paragraph 5-36.11).

5-40.45 Replace Gear Limit Switches.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench

SUPPLIES: Gear Limit Switches
Wire Ties

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

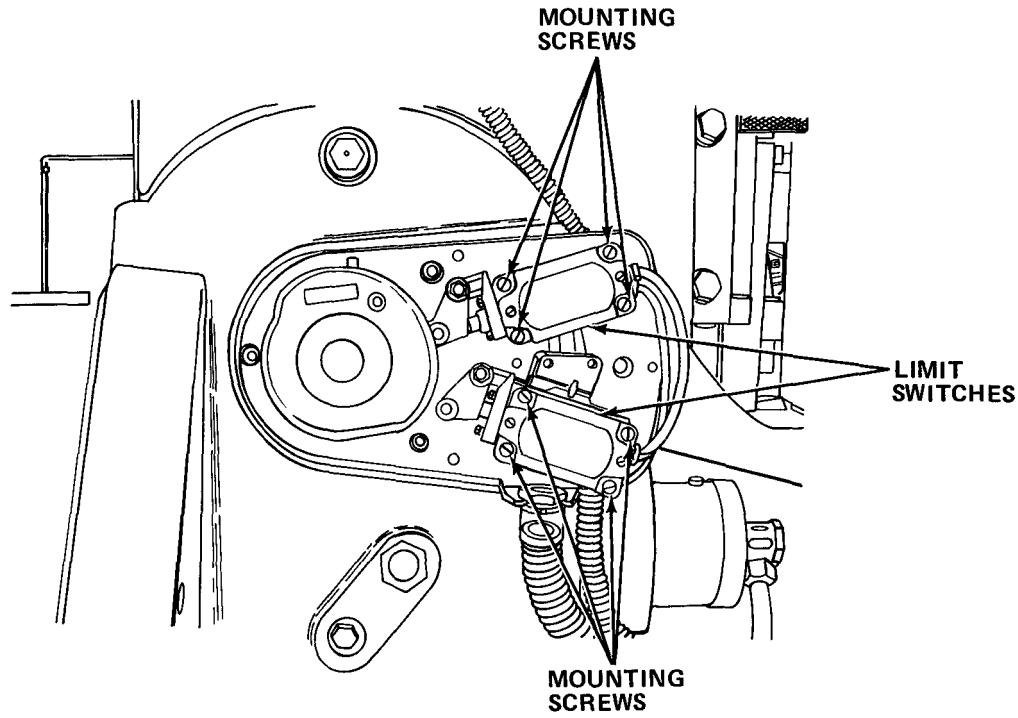
(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

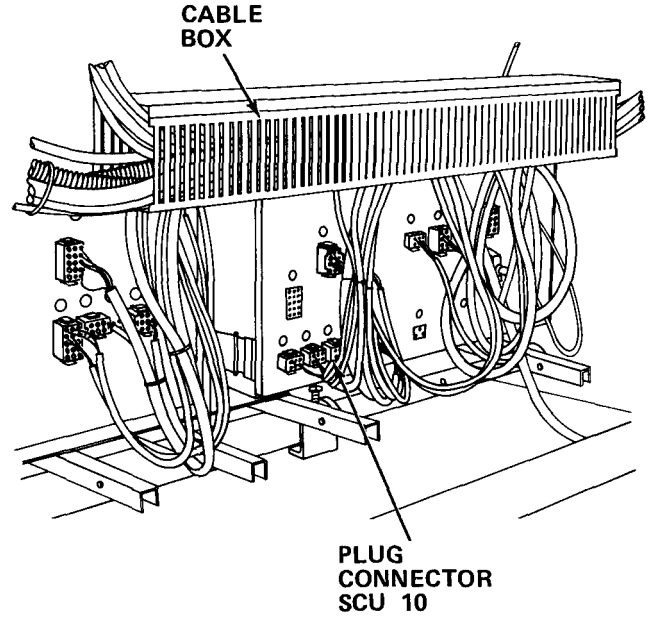
b. Remove the limit switch cover.

c. Remove the rear electronics enclosure cover.

d. Cut wire ties as necessary.



e. Remove mounting screws and both limit switches.



f. Remove cable box cover and carefully remove limit switches, cable and relay box from the cable box.

g. Disconnect cable plug connector SCU 10, and remove defective assembly.

h. Install new assembly into cable box.

i. Reconnect plug connector SCU 10.

j. Reinstall cable box cover.

k. Reinstall limit switch assembly.

l. Install new wire ties as required.

m. Reinstall the rear electronics enclosure cover.

n. Perform gear limit switch adjustments (paragraph 5-40.58).

5-40.46 Replace Main Drive Gear and Clutch Assembly.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Four persons are required to perform this procedure.

TOOLS: Flat Tip Screwdriver
24 mm Combination Wrench
22 mm Combination Wrench
19 mm Combination Wrench
5 mm Hex Socket Bit with 3/8 in. Drive
17 mm Socket with 3/8 in. Drive
19 mm Socket with 3/8 in. Drive
3/8 in. Drive Ratchet
Pry Bar
Ball Peen Hammer
1/4 in. Punch, 8 in. long

SUPPLIES: Main Drive Gear and Clutch Assembly
Liquid Gasket (Item 14, Appendix E)
Gear Oil (Item 10, Appendix E)
Pail

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

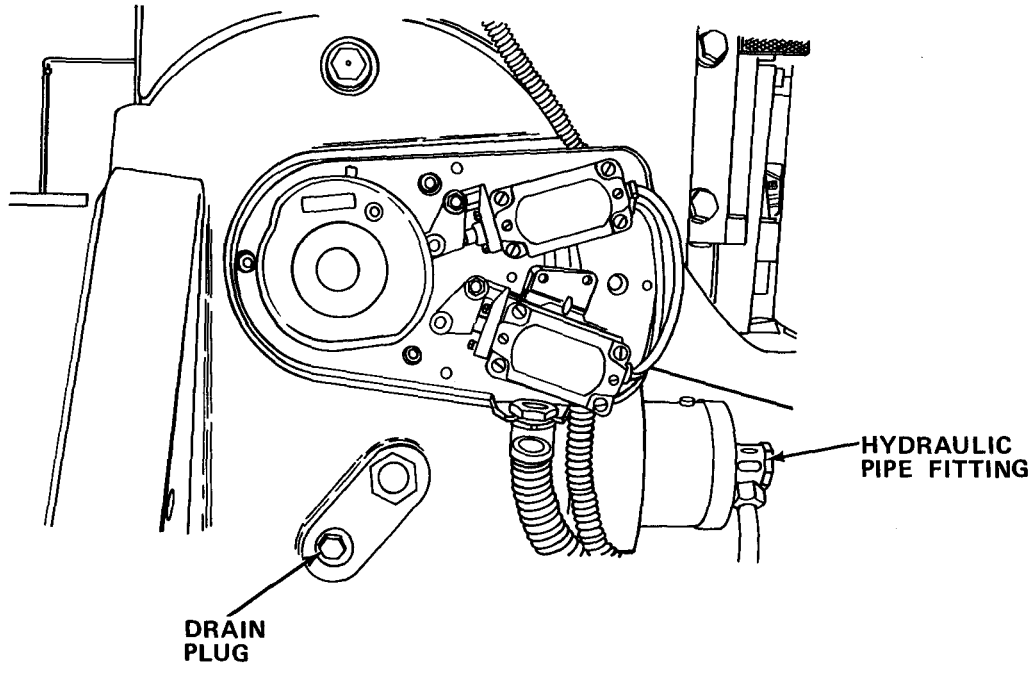
(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove the cover over the gear limit switches.

c. Remove the nylon cams and washers/spacers.

d. Remove gear limit switch mounting plate.



e. Remove drain plug and drain gear oil into pail.

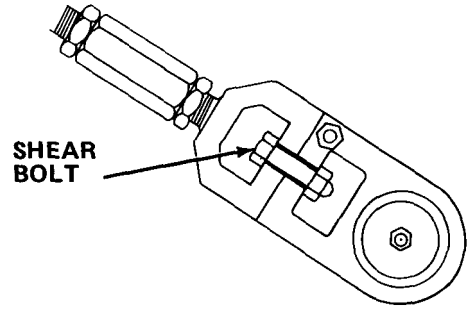
f. Place a pail under hydraulic pipe fitting and remove pipe.

g. Remove both sides of the main motor V-belt cover.

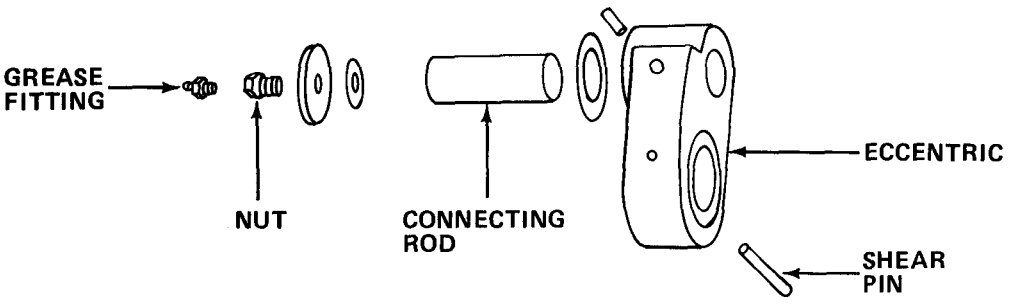
h. Remove clutch V-belt (paragraph 5-36.4).

i. Remove eccentric cover plate.

j. Remove top plastic cover on right side.



k. Remove connecting rod shear bolt.



WARNING

Be sure knife carrier assembly is blocked with 2 x 4's. Serious injury or death may occur from failure to observe this precaution.

l. Remove grease fitting, nut, and connecting rod from eccentric.

WARNING

Serious injury may occur if inadequate number of personnel are used to move main drive gear and clutch assembly. This equipment weighs approximately 280 lbs (127 kg).

m. Have three persons hold the main drive gear and clutch assembly from behind the cutter. A fourth person must remove the mounting bolts and carefully remove defective main drive gear and clutch assembly.

n. Drive out pin and pry eccentric from drive shaft.

o. Reinstall eccentric by alining tab and carefully tap eccentric onto shaft with hammer.

p. Have three persons install the new main drive gear and clutch assembly from behind the cutter while a fourth person installs mounting bolts.

q. Manually rotate clutch and install connecting rod shear bolt.

r. Reinstall top cover.

s. Reinstall eccentric cover plate.

t. Reinstall clutch V-belt (paragraph 5-36.4).

u. Reinstall both sides of the main motor V-belt cover.

v. Reconnect the hydraulic pipe.

w. Reinstall gear limit switches and mounting plate.

x. Reinstall the nylon cams and washers/spacers.

y. Reinstall the cover over the gear limit switches.

z. Add gear oil to gear box as necessary to fill.

aa. Perform knife replacement procedures to readjust all carrier adjustments (paragraph 5-36.11).

ab. Bleed the hydraulic system (paragraph 5-40.65).

5-40.47 Replace Safety Bolt Proximity Switches.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
13 mm Combination Wrench

SUPPLIES: Safety Bolt Proximity Switches

WARNING

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

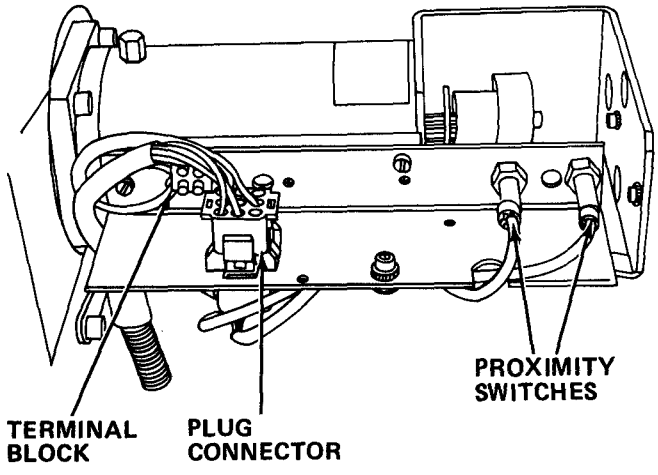
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove the cover from the safety bolt.



c. Remove the nuts securing the proximity switches. Note the wiring of the switches to be sure which switch is mounted forward and which switch is mounted to the rear. Remove the switches.

d. Remove plug connector from safety bolt.

e. Push out plug connector mounted in mounting frame by pressing in on both tab locks and pushing connector down.

f. Tag and disconnect two wires going to terminal block.

g. Install new connector in mounting frame.

h. Reconnect wires to terminal block.

i. Reinstall plug connector.

j. Reinstall new proximity switches, being sure that switches are mounted as noted in step c.

k. Perform safety bolt proximity switches adjustment (paragraph 5-40.61).

5-40.48 Replace Safety Bolt.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
5 mm Hex Head Key Wrench

SUPPLIES: Safety Bolt

WARNING

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

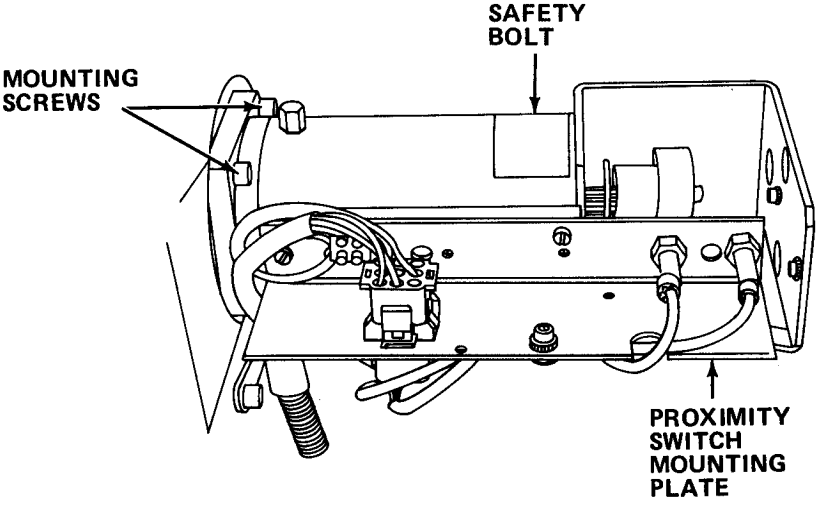
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove cover from the safety bolt.



c. Tag and disconnect two safety bolt wires.

d. Remove safety bolt proximity switch mounting plate.

e. Remove mounting screws and defective safety bolt.

f. Install new safety bolt and secure with screws.

g. Reinstall safety bolt proximity switch mounting plate.

h. Reconnect safety bolt wires.

i. Reinstall safety bolt cover.

j. Place operator key back into safety lock.

5-40.49 Replace Cutting Buttons.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Cutting Button

WARNING

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

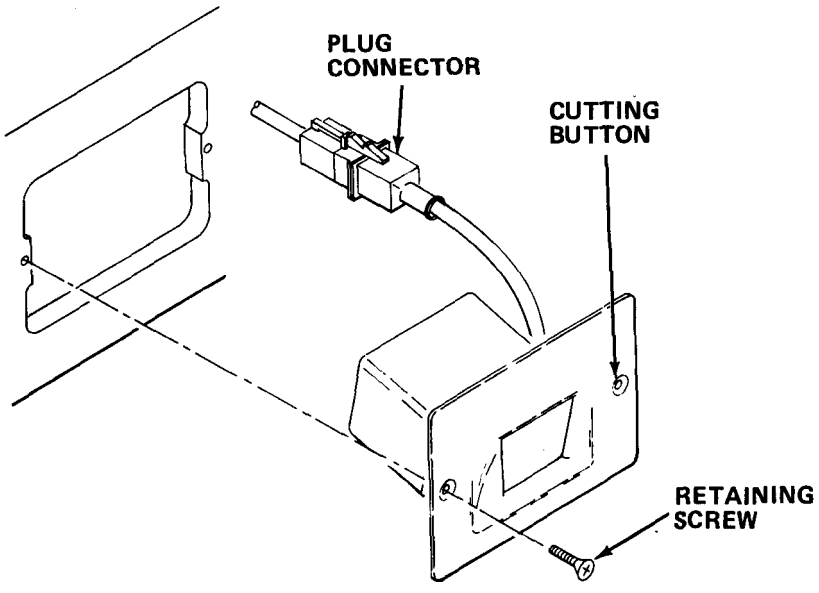
a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Disconnect plug connector from defective cutting button.



c. Remove retaining screws and defective cutting button.

d. Install new cutting button and secure with screws.

e. Reconnect plug connector.

f. Place operator key back into safety lock.

5-40.50 Replace Paper Cutter.

MOS: 83FJ6, Reproduction Equipment Repairer

PERSONNEL: Six persons are required to perform this procedure.

TOOLS: Flat Tip Screwdriver
15/16 in. Socket with 1/2 in. Drive
1/2 in. Drive Ratchet
13 mm Combination Wrench
23 mm Combination Wrench
15 mm Combination Wrench
14 mm Hex Head Key Wrench
17 mm Hex Head Key Wrench
5 mm Hex Head Key Wrench
7/16 in. Combination Wrench
Crow Bar
Long Tine Fork Lift
Hydraulic Pallet

SUPPLIES: Paper Cutter

a. Remove paper shredder (paragraph 4-20.10).

b. Remove bindery table (paragraph 8-16.1).

c. Remove paper drilling machine (paragraph 2-16.7).

d. Remove book and pamphlet stitcher (paragraph 3-16.10).

e. Remove photolithographic cabinet (paragraph 8-16.4).

f. Remove roadside wall storage cabinet (paragraph 8-16.2).

g. Remove photolithographic cabinet (paragraph 8-16.3).

h. Remove shock mounts for paper shredder.

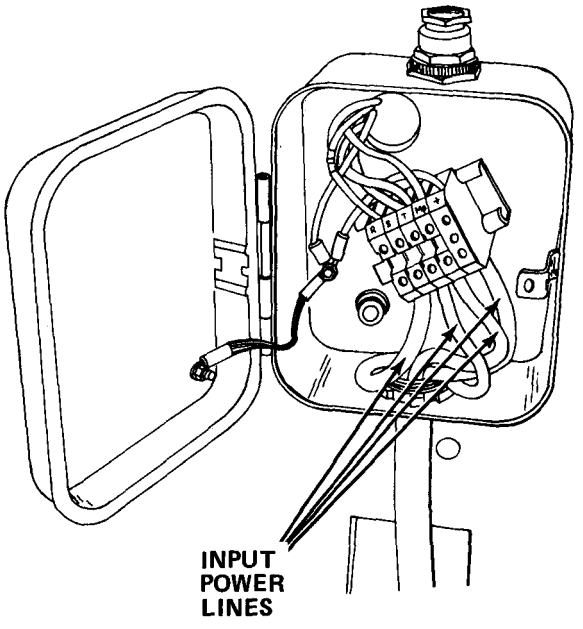
i. Remove all strapped down and loose objects.

j. Remove all tiedown straps.

WARNING

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

k. Turn off circuit breaker.



l. Remove cover from power connection box.

m. Tag and disconnect input power wires.

n. Remove power cable connector and cable.

o. Remove rear electronics enclosure cover.

p. Remove clamp foot pedal (paragraph 5-36.9).

q. Reinstall rear electronics enclosure cover.

r. Remove clamp foot pedal cover.

s. Remove center mounting bolts from floor mounts.

t. Lay sheets of metal along the floor lengthwise in a path for use by the hydraulic pallet.

u. Place the forks under the center of the paper cutter.

WARNING

Serious injury may occur if inadequate number of personnel are used to move the paper cutter. This equipment weighs 4600 lbs.

v. Raise paper cutter up.

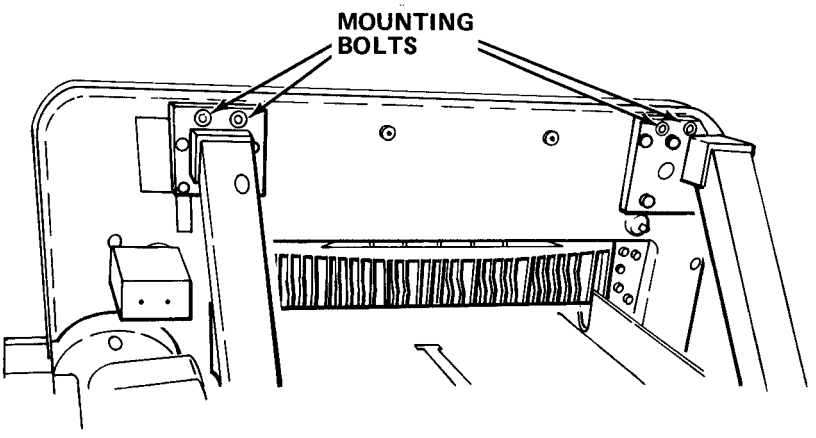
w. Push paper cutter to the rear of the van as far as possible.

x. Using a crow bar, lower the clamp and insert a board on top of the clamp; then release the clamp.

y. Using a forklift, place a piece of wooden board across the forks and move the forks under the clamp.

z. Place rags along the table where the forks are to prevent damage to the table.

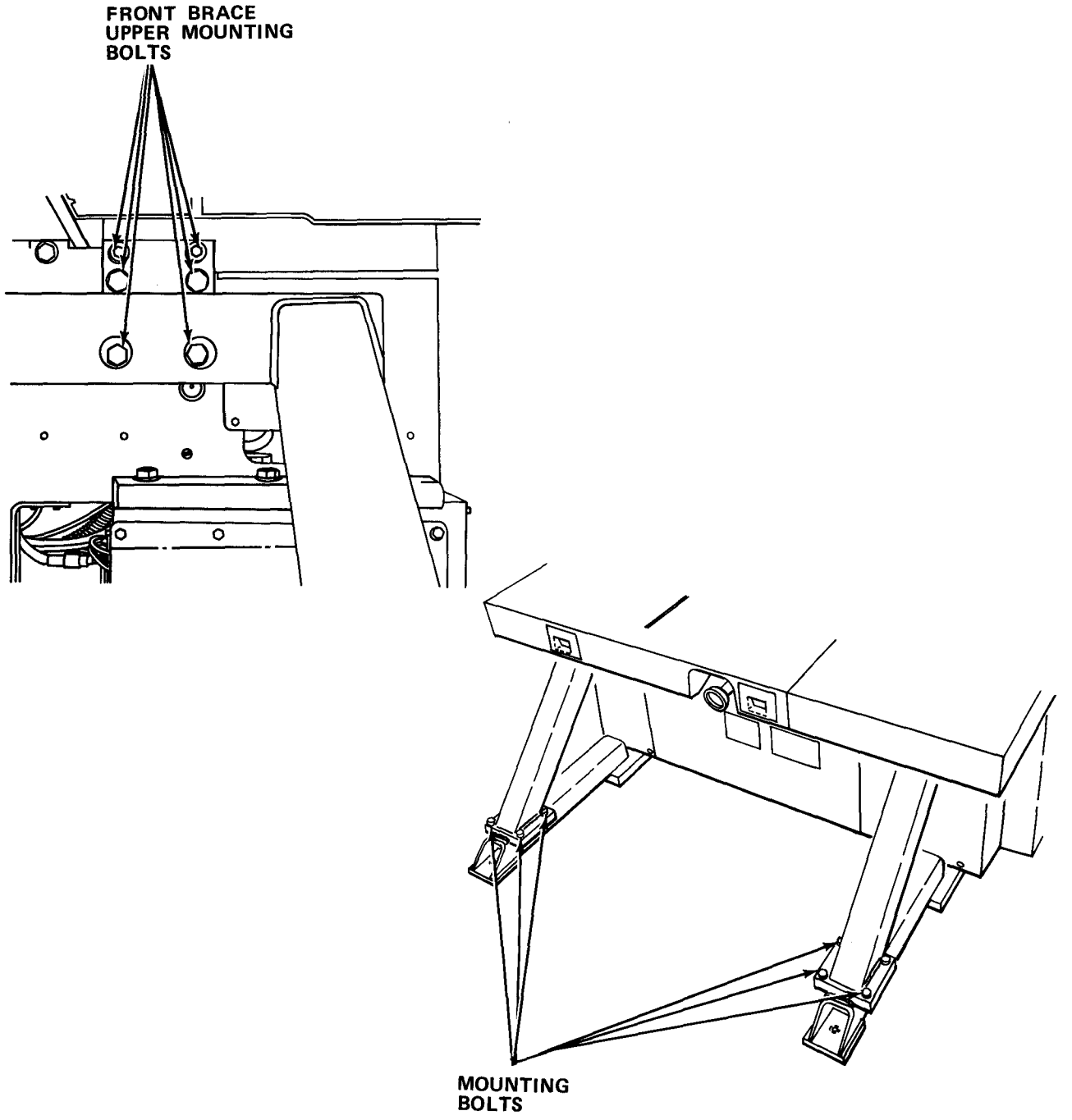
aa. Lift the paper cutter up with the forklift and remove the paper cutter.



ab. Remove mounting bolts from upper rear brace.

ac. Remove mounting bolts from sides of table.

ad. Remove rear brace mounting bolts and remove rear brace.



ae. Remove front brace upper mounting bolts.

af. Remove lower front brace mounting bolts and brace.

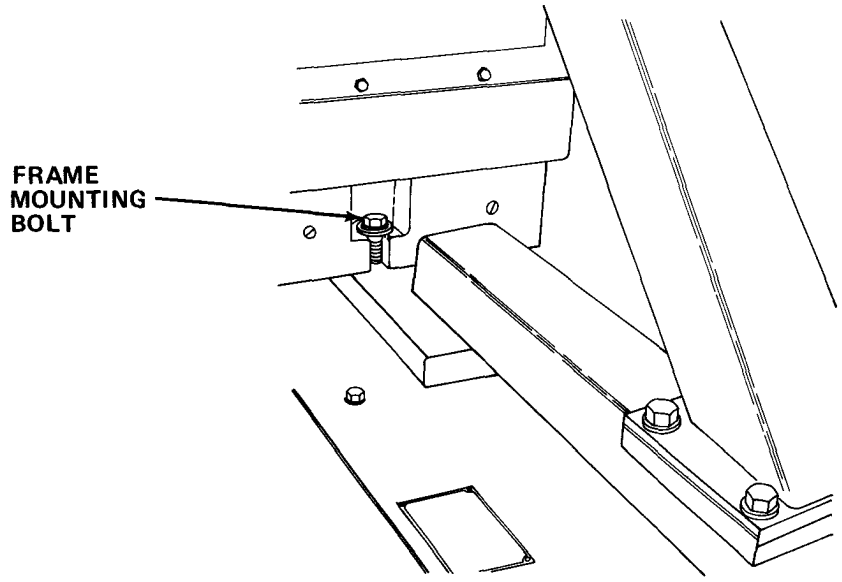
ag. Remove front electronics enclosure cover.

ah. Remove right pillar cover.

ai. Remove frame mounting bolts.

aj. Remove right pillar cover.

ak. Remove power supply cover.



al. Remove frame mounting bolts.

am. Reinstall power supply cover.

an. Reinstall front electronics enclosure cover.

ao. Repeat steps y. through aa. to lift defective paper cutter off of support frame. Be sure to insert backgauge table support leg before setting defective paper cutter down.

ap. Using a crow bar, lower clamp and remove wooden board.

aq. Refer to Service Upon Receipt for assembly of new paper cutter (paragraph 5-33).

ar. Using a crow bar, lower clamp of new paper cutter and insert a wooden board, then release clamp.

as. Remove rear electronics enclosure cover.

at. Remove clamp foot pedal (paragraph 5-36.9).

au. Remove clamp foot pedal cover.

av. Reinstall rear electronics enclosure cover.

WARNING

Serious injury may occur if inadequate number of personnel are used to move the paper cutter. This equipment weighs 4600 lbs.

aw. Repeat steps y. through aa. to lift new paper cutter onto support frame. Be sure to insert backgauge table support leg before setting new paper cutter down.

ax. Remove front electronics enclosure cover.

ay. Remove right pillar cover.

az. Install frame mounting bolts.

ba. Reinstall right pillar cover.

bb. Remove power supply cover.

bc. Install frame mounting bolts.

bd. Reinstall power supply cover.

be. Reinstall front electronics enclosure cover.

bf. Install lower front brace and secure with lower mounting bolts.

bg. Install upper front brace mounting bolts.

bh. Install rear brace and secure with lower mounting bolts.

bi. Install mounting bolts on sides of table.

bj. Install upper mounting bolts on rear brace.

bk. Repeats steps y.-aa. and place new paper cutter into van.

bl. Using crow bar, lower clamp and remove wooden board.

bm. Repeat steps t.-v.and push paper cutter to front of van, alining mounting bolt holes.

bn. Install mounting bolts.

bo. Remove rear electronics enclosure cover.

bp. Install clamp foot pedal (paragraph 5-36.9).

bq. Reinstall rear electronics enclosure cover.

br. Reinstall foot pedal cover.

bs. Install power cable and connector.

bt. Reconnect input power wires.

bu. Remove sheets of metal.

bv. Install all tiedowns.

bw. Reinstall all loose objects and strapped down material.

bx. Reinstall shock mounts for paper shredder.

by. Reinstall photolithographic cabinet (paragraph 8-16.3).

bz. Reinstall roadside wall storage cabinets (paragraph 8-16.2).

ca. Reinstall photolithographic cabinet (paragraph 8-16.4).

cb. Reinstall book and pamphlet stitcher (paragraph 3-16.10).

cc. Reinstall paper drilling machine (paragraph 2-16.7).

cd. Reinstall bindery table (paragraph 8-16.1).

ce. Reinstall paper shredder (paragraph 4-20.10).

5-40.51 Repair Right Light Barrier Assembly.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver

SUPPLIES: Connector Board
Emitter Diode and Lens

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

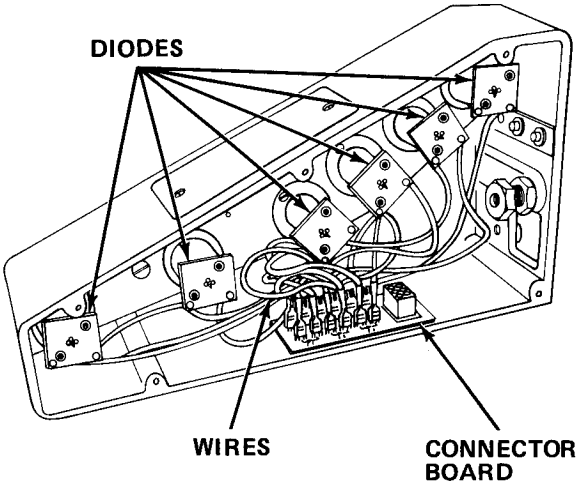
(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove screws and right light barrier housing cover.

c. To replace connector board, proceed to step e.

d. To replace emitter diode and lens, proceed to step f.

e. Replace connector board as follows:



(1) Tag and disconnect all wiring and remove plug connector.

(2) Loosen captive screws and remove defective connector board.

(3) Install new connector board and secure with screws.

(4) Reconnect all wiring and proceed to step g.

f. Replace emitter diode and lens as follows:

(1) Tag and disconnect wires for defective diode from connector board.

(2) Remove retaining screws on defective lens and remove lens and diode.

(3) Install new lens and diode and secure with screws.

(4) Reconnect emitter diode wiring to connector board.

(5) Perform light barrier adjustments (paragraph 5-40.62).

g. Reinstall light barrier cover and secure with screws.

h. Insert operator key back into safety lock.

5-40.52 Repair Left Light Barrier Assembly

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
No. 0 Cross Tip Screwdriver
Connector Pin Extractor/Insertion Tool

SUPPLIES: LS Circuit Board
Infrared Light Receiver and Lens

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to 0 position.

(2) Turn main power switch to 0 position.

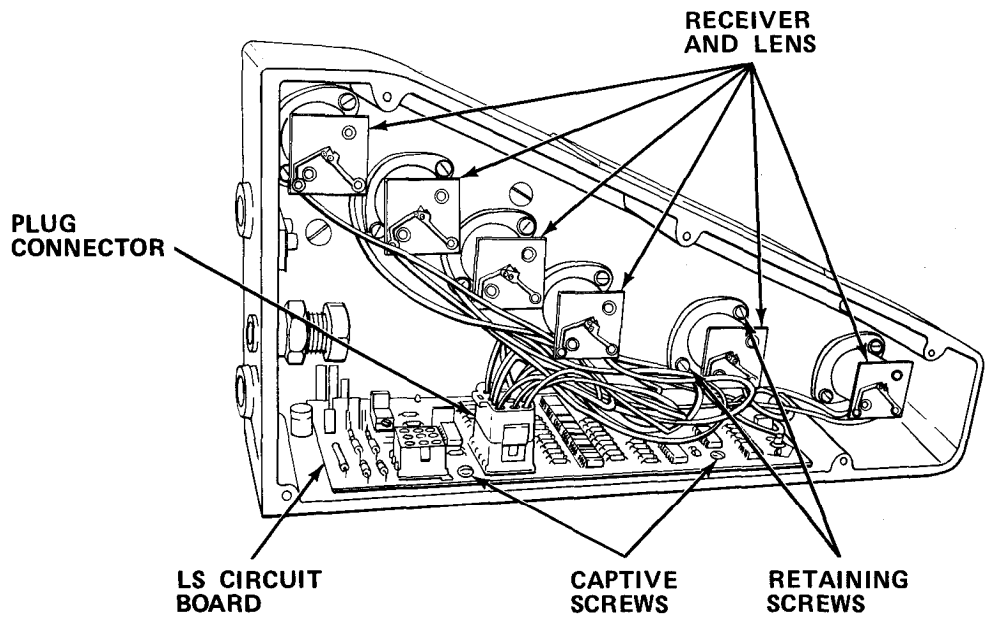
(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove screws and left light barrier housing cover.

c. To replace LS circuit board, proceed to step e.

d. To replace infrared receiver and lens, proceed to step f.

e. Replace LS circuit board as follows:



(1) Disconnect plug connectors from the circuit board.

(2) Loosen captive screws and carefully pull out defective LS circuit board.

(3) Slide in new LS circuit board and secure with screws.

(4) Reconnect plug connector.

(5) Proceed to step g.

f. Replace receiver and lens as follows:

(1) Disconnect connector plug and using pin extractor tool, tag and remove pins and wires for defective receiver.

(2) Remove retaining screws on defective receiver and lens. Remove lens.

(3) Install new receiver lens, secure with screws.

(4) Using pin insertion tool reconnect pins and wires into connector and reconnect connector.

(5) Perform light barrier adjustments (paragraph 5-40.62).

g. Reinstall light barrier cover and secure with screws.

h. Place operator key back into safety lock.

5-40.53 Repair Control Panel.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
Knife, TL 29
No. 2 Cross Tip Screwdriver
Heat Shrink Gun
6 mm Hex Head Key Wrench

SUPPLIES: Wire Ties
1-1/2 in. Diameter Heat Shrink
Star-Delta Switch
Main Power Switch
Control Power on Switch

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

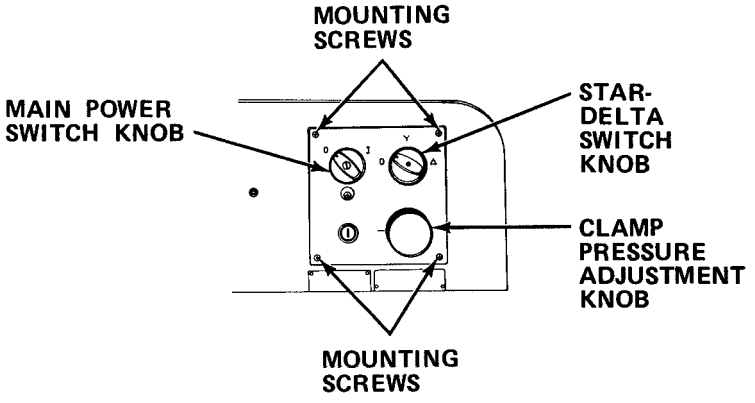
(2) Turn main power switch to O position.

(3) Using operator key, lock the safety lock.

b. Turn off circuit breaker.

c. Remove cover on clamp pressure adjustment knob.

d. Note position of clamp pressure adjustment knob.



e. Remove screw and remove clamp pressure adjustment knob.

f. Remove screw and pull off main power switch knob.

g. Remove screws and main power switch ring.

h. Remove screw and Star-Delta switch knob.

i. Remove screws and Star-Delta switch ring.

NOTE

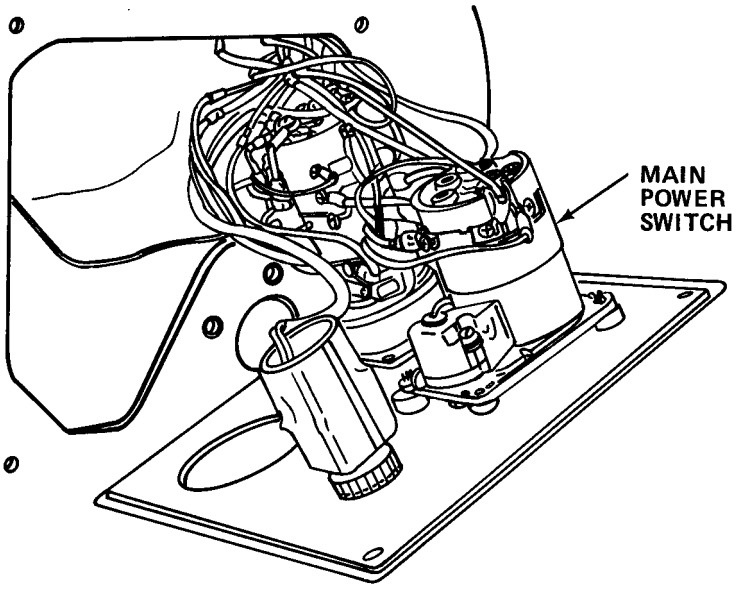
Short wires prevent removal of switch mounting plate.

j. Remove screws and control panel cover. Pull switch mounting plate and let it rest on its side.

k. To replace main power switch, proceed to step n.

l. To replace Star-Delta switch, proceed to step o.

m. To replace control power on switch, proceed to step p.



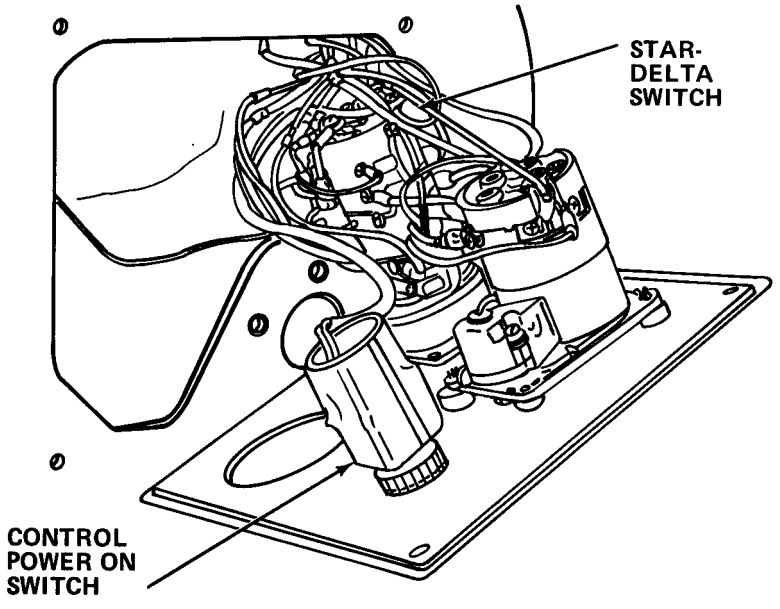
n. To replace main power switch, proceed as follows.

(1) Tag and disconnect wiring from switch.

(2) Remove retaining nuts, washers, screws, and defective switch.

(3) Install new switch and secure with screws, washers, and nuts.

(4) Reconnect wiring and proceed to step q.



o. To replace Star-Delta switch, proceed as follows:

(1) Tag and disconnect wiring from switch.

(2) Remove retaining nuts, washers, screws, and defective switch.

(3) Install new switch and secure with screws, washers, and nuts.

(4) Reconnect all wiring and proceed to step q.

p. To replace control power on switch, proceed as follows.

(1) Cut heat shrink away from defective switch.

(2) Tag and disconnect wiring.

(3) Remove retaining screw in center of switch and remove defective switch.

(4) Install new switch and secure with retaining screw.

(5) Place heat shrink around wires and reconnect wires.

(6) Place heat shrink around switch and shrink with heat shrink gun.

q. Reinstall switch mounting plate and cover, and retain with screws.

r. Reinstall Star-Delta switch ring and retain with screws.

s. Reinstall Star-Delta switch knob and secure with screw.

t. Reinstall main power switch ring and retain with screws.

u. Reinstall main power switch knob and secure with screw.

v. As noted in step d., reinstall clamp pressure adjustment knob and secure with screw.

w. Reinstall cover on clamp pressure adjustment knob.

x. Turn on circuit breaker.

5-40.54 Repair Power Module Assembly.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
8 mm Combination Wrench
10 mm Combination Wrench
13 mm Combination Wrench

SUPPLIES: PMF Fuse Board
PMD Distribution Board
PMR Rectifier Board
Main Transformer
Capacitor
Bridge Rectifier
Circuit Breaker

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position and then to O position.

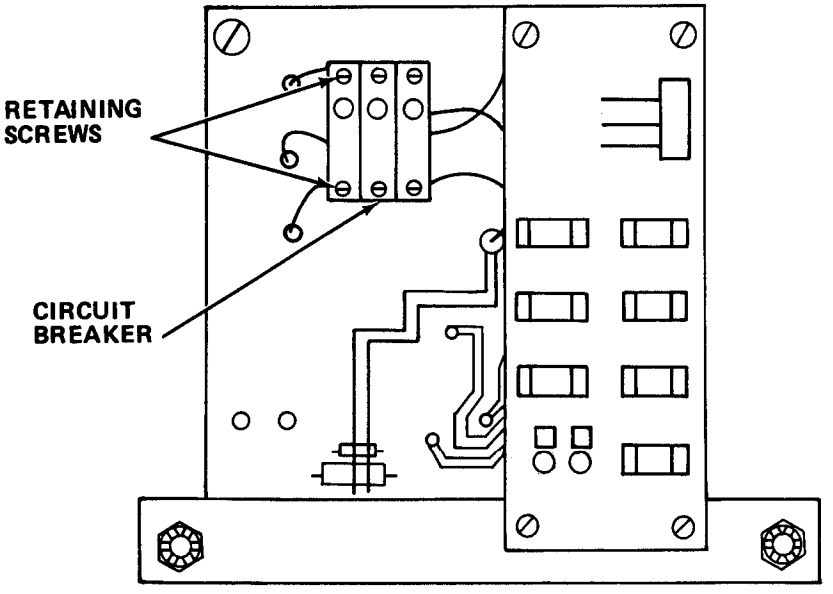
(2) Turn main power switch to O position.

(3) Turn off circuit breaker.

b. Remove front electronics enclosure cover.

c. Remove power supply cover.

d. To replace circuit breaker, perform the following:



(1) Remove retaining screws on defective circuit breaker.

(2) Tag and disconnect wires from defective circuit breaker.

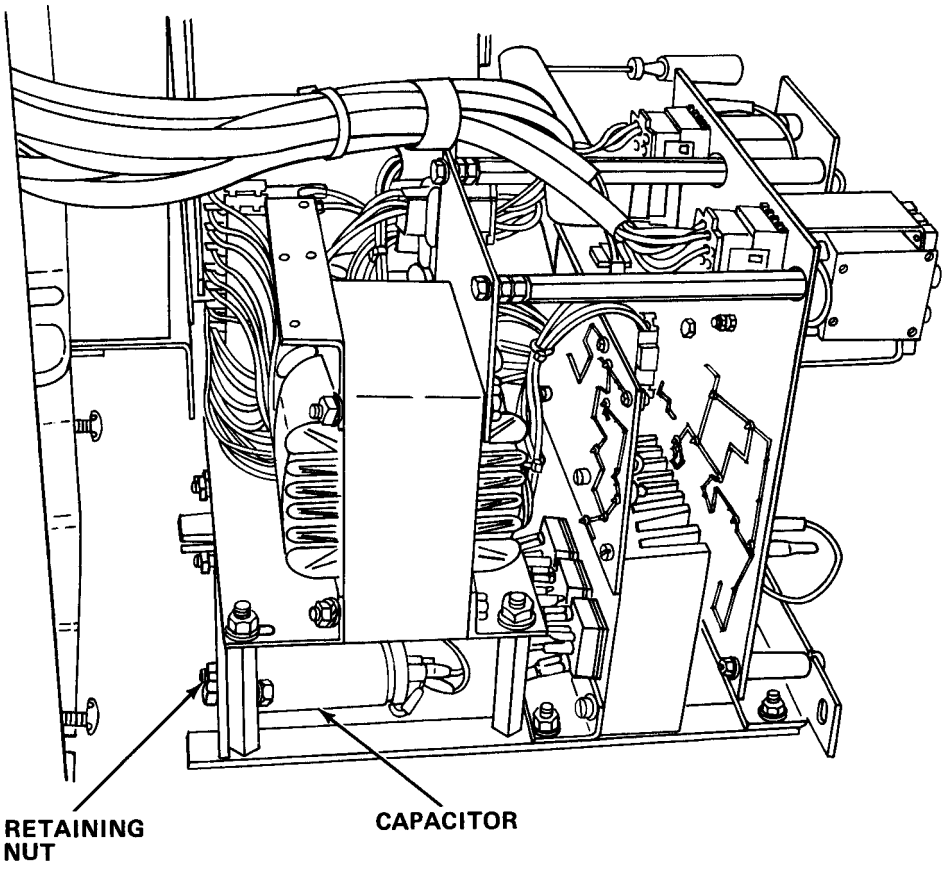
(3) Reconnect wires to new circuit breaker.

(4) Install new circuit breaker and secure with screws.

(5) Proceed to step ah.

e. Remove bottom frame screws of power module and slide power module out for easy access to parts.

f. To replace capacitor, perform the following steps:



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.

(1) Remove retaining nut on back of defective capacitor.

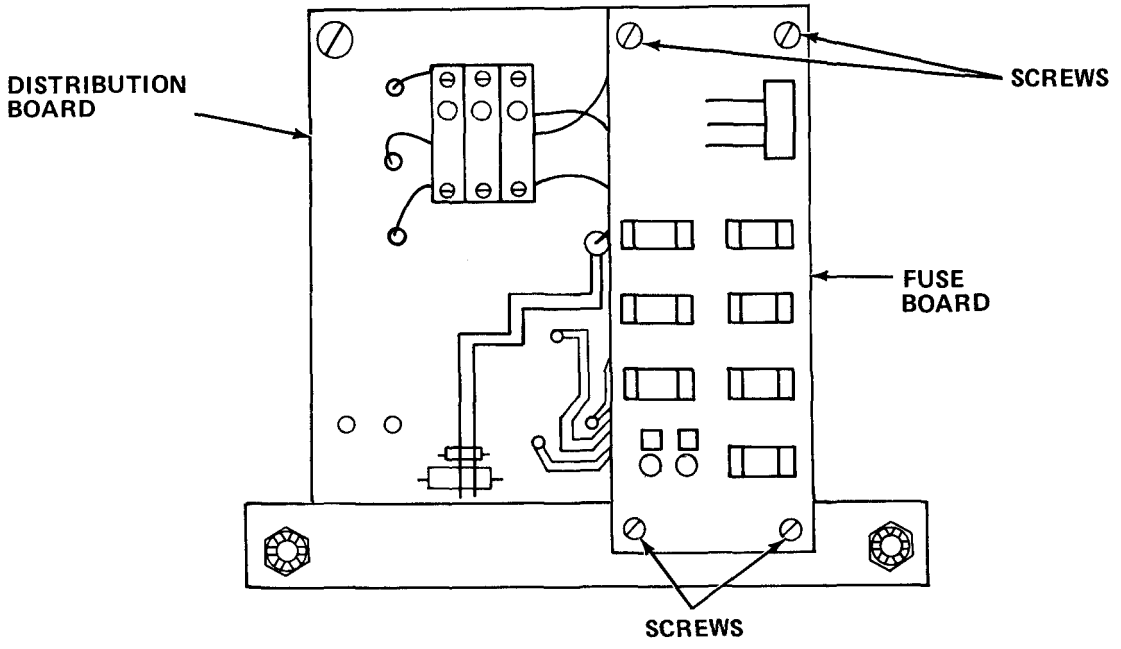
(2) Tag and disconnect wires from defective capacitor.

(3) Reconnect wires to new capacitor.

(4) Install new capacitor and secure with nut.

(5) Proceed to step ag.

g. Remove screws and spacers holding fuse board in place.



h. Tag and disconnect wires from fuse board.

i. Disconnect plug connectors 400 and 401.

j. Remove fuse board. If this is the defective part, proceed to step ad., and install new fuse board.

k. Remove two screws on left side of distribution board.

l. Remove plug connectors 408, 409, 410 and 411.

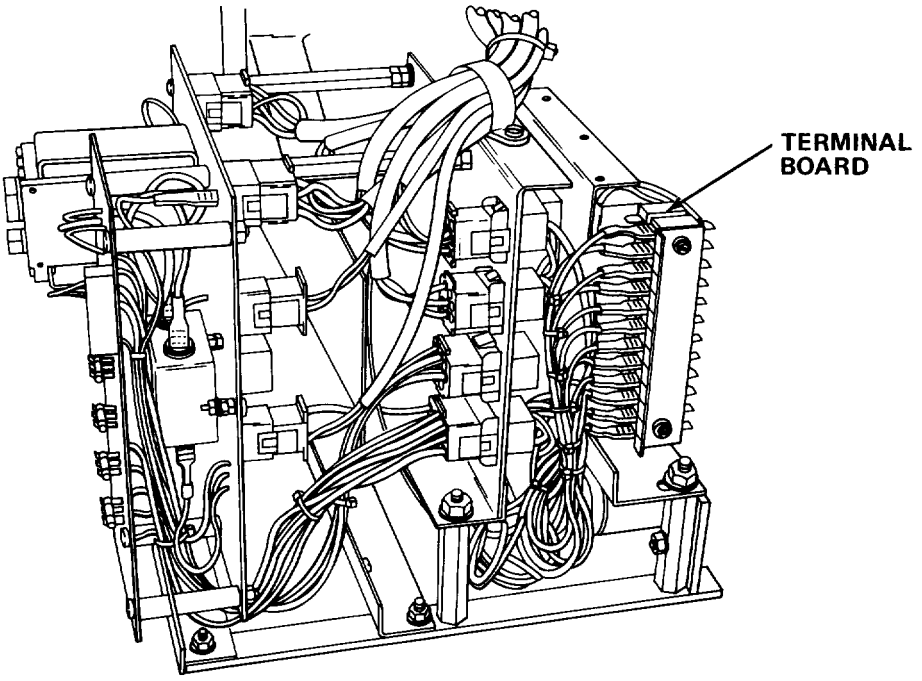
m. Remove distribution board. If this is the defective part, proceed to step ab., and install new board.

n. Remove two mounting screws and rectifier board with rectifiers attached.

o. Tag and disconnect wires from bridge rectifiers.

p. Disconnect plug connectors on top of rectifier board.

q. Remove rectifier board. If rectifier board or a bridge rectifier is defective, proceed to step v.

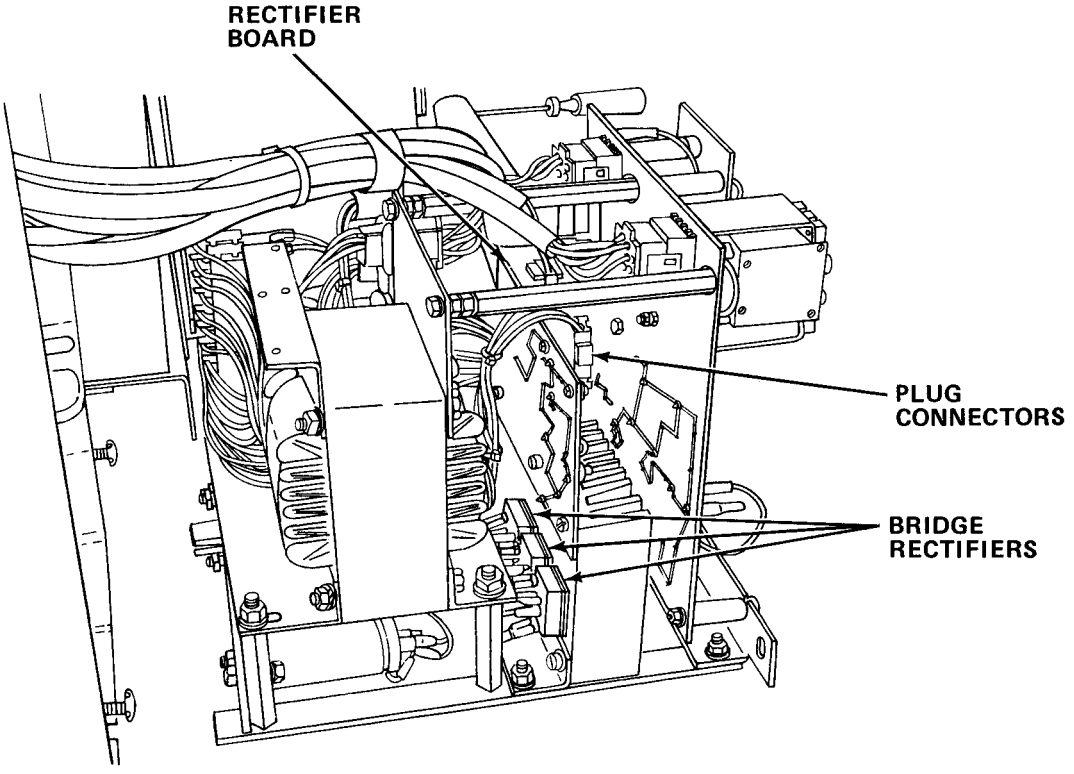


r. Tag and disconnect wires from terminal board on right side of transformer.

s. Remove mounting bolts and defective transformer.

t. Install new transformer and secure with mounting bolts.

u. Reconnect wiring to terminal board and proceed to step y.



v. If the rectifier board was defective, remove three bridge rectifiers, or proceed to step x.

w. Install bridge rectifiers on new rectifier board and proceed to step y.

x. Remove defective bridge rectifier and install new bridge rectifier.

y. Reconnect plug connectors on top of rectifier board.

z. Reconnect wiring on bridge rectifiers.

aa. Reinstall rectifier board with rectifiers attached.

ab. Install distribution board and reconnect plug connectors 408, 409, 410, and 411.

ac. Secure distribution board with screws.

ad. Reconnect plug connectors 400 and 401 from fuse board.

ae. Reconnect wires from terminal board.

af. Secure fuse board in place with bolts and spacers.

ag. Carefully slide power module back into pillar and secure with bolts.

ah. Reinstall power module cover.

ai. Reinstall front electronics enclosure cover.

aj. Place operator key back into safety lock.

5-40.55 Adjust Clamp Foot Pedal Pressure.

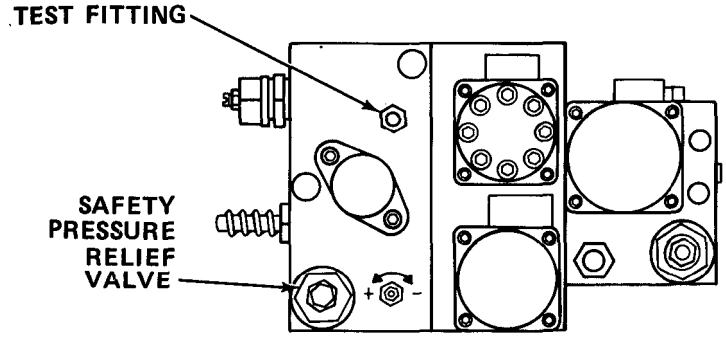
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
13 mm Socket with 3/8 in. Drive
19 mm Deep Well Socket with 3/8 in. Drive
3/8 in. Drive Ratchet
6 mm Hex Head Key Wrench
22 mm Combination Wrench
0-150 Bar Manometer Gage

a. Remove front electronics enclosure cover.

b. Remove right pillar cover.

c. Remove bolts and hydraulic system cover plate.



d. Remove nut and ball on test fitting on P1 side of control block.

e. Install manometer gage onto test fitting.

f. Turn on power.

(1) Using operator key, unlock the safety lock.

(2) Turn main power switch to I position.

(3) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position.

(4) Press control power on switch.

g. Move the backgauge forward or backward as required until backgauge position is displayed on measurement display.

h. Press down on the clamp foot pedal several times to bring the hydraulics up to normal operating temperature.

i. Once the hydraulics are at a normal operating temperature, press down and hold the clamp foot pedal.

WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

j. Check the pressure on the manometer gage. If the pressure on the gage is 16 bar (227 psi), proceed to step m.

k. If the pressure is above or below 16 bar (227 psi), it will be necessary to adjust the safety pressure. This is done by removing the cap on the safety pressure relief valve and loosening the locking nut. Using hex head key wrench, rotate the stem in for more pressure and out for less pressure.

l. Repeat steps j. and k. until proper pressure is obtained.

m. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

n. After the main motor has stopped, remove the manometer gage and reinstall the test fitting nut and ball.

o. Bleed the hydraulic system (paragraph 5-40.65).

5-40.56 Adjust Clamp Pressure.

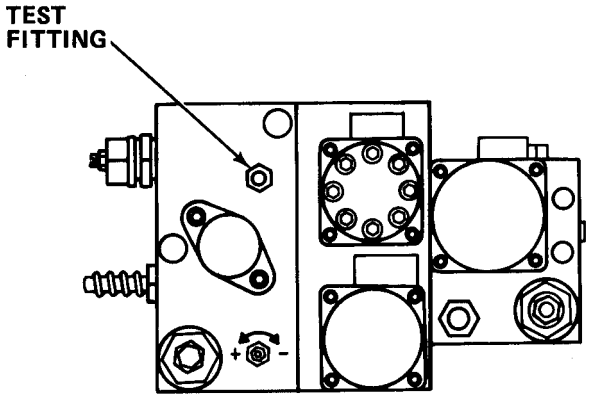
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
17 mm Combination Wrench
13 mm Combination Wrench
22 mm Combination Wrench
0-150 Bar Manometer Gage

a. Remove front electronics enclosure cover.

b. Remove right pillar cover.

c. Remove bolts and hydraulic system cover plate.



d. Remove nut and ball on test fitting on P1 side of control block.

e. Install manometer gage onto test fitting.

f. Turn on power.

(1) Using operator key, unlock the safety lock.

(2) Turn main power switch to I position.

(3) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position.

(4) Press control power on switch.

g. Move the backgauge forward or backward as required until backgauge position is displayed on measurement display.

WARNING

Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.

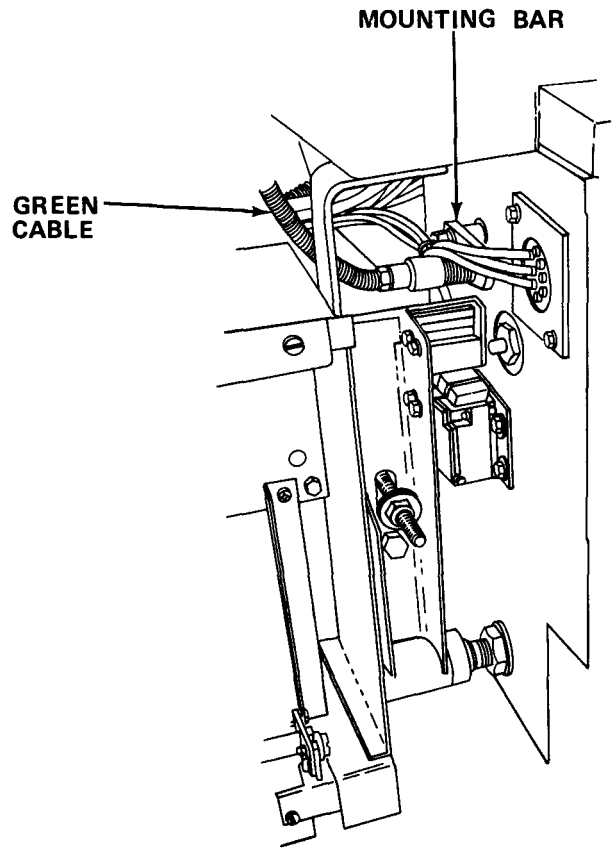
h. Perform several cutting operations to bring hydraulic system up to normal operating temperature.

i. Set clamp pressure adjustment knob to 150.

WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

j. While performing a cutting operation, check the pressure reading on the manometer gage. If between 30 (427 psi) and 32 bar (455 psi), proceed to step m.



k. If the pressure is above 32 bar (455 psi) or below 30 bar (427 psi), it will be necessary to adjust the green cable. This is done by loosening the nuts on the mounting bar for the cable and moving the cable in for more pressure, and out for less pressure.

l. Repeat steps j. and k. until proper pressure is obtained.

m. Set clamp pressure adjustment knob to 3000.

n. While performing a cutting operation, check the pressure reading on the manometer gage. If the reading is 115 bar (1636 psi), proceed to step q.

o. If the pressure is above or below 115 bar (1636 psi), it will be necessary to adjust the clamp pressure adjusting knob. This is done by removing the knob and rotating the scale ring to allow for either more or less rotation of the knob.

p. Repeat steps n. and o. until proper pressure is obtained.

q. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

r. After the main motor has stopped, remove the manometer gage and reinstall test fitting nut and ball.

s. Bleed the hydraulic system (paragraph 5-40.65).

5-40.57 Adjust Clutch Pressure.

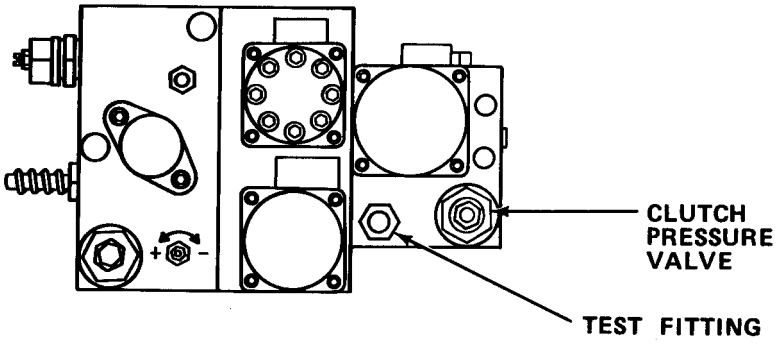
MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
13 mm Socket with 3/8 in. Drive
19 mm Deep Well Socket with 3/8 in. Drive
3/8 in. Drive Ratchet
6 mm Hex Head Key Wrench
10 mm Combination Wrench
22 mm Combination Wrench
27 mm Combination Wrench
0-150 Bar Manometer Gage

a. Remove front electronics enclosure cover.

b. Remove right pillar cover.

c. Remove bolts and hydraulic system cover plate.



d. Remove nut and ball on test fitting on P2 side of control block.

e. Install manometer gage onto test fitting.

f. Turn on power.

(1) Using operator key, unlock the safety lock.

(2) Turn main power switch to I position.

(3) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position.

(4) Press control power on switch.

g. Move the backgauge forward or backward as required until backgauge position is displayed on the measurement display.

WARNING

Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.

h. Perform several cuts to bring the hydraulics up to normal operating temperature.

WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

i. After hydraulic temperature is at normal, perform a cut and check the pressure on the pressure gage. It should read 65 bar (925 psi). If correct, proceed to step 1.

NOTE

Pressure between 35-40 bar (498 - 569 psi) could indicate a poorly adjusted or defective inch valve, or defective inch valve cable.

j. If the pressure is above or below 65 bar (925 psi), it will be necessary to adjust the clutch pressure. This is done by loosening the locking nut on the clutch pressure valve and, using a hex head key wrench, rotate the stem in for more pressure and out for less pressure.

k. Repeat steps i. and j. until proper pressure is obtained.

l. Lower the clamp to the table and pull the clamp pressure adjustment knob out .

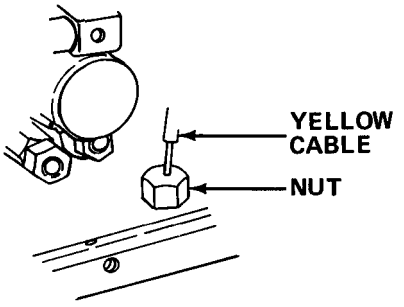
m. Perform a cut and check the pressure on the pressure gage. It should read between 35 bar (498 psi) and 40 bar (569 psi). If correct, proceed to step o.

n. If incorrect pressure is obtained, adjust inch valve cable by performing the following:

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) After the main motor has stopped, remove the nut and cable on top of the inch valve.



(4) Adjust the adjusting nuts on the cable either down for more pressure or up for less pressure.

(5) Reinstall the nut and cable onto the inch valve.

(6) Turn main power switch to I position.

(7) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn switch to △ position.

(8) Press in clamp pressure adjustment knob.

(9) Repeat steps i. through n. until proper adjustments have been obtained.

o. Turn off power.

(1) Turn Star-Delta switch to Y position and then to O position.

(2) Turn main power switch to O position.

p. After the main motor has stopped, remove the manometer gage and reinstall the test fitting nut and ball.

q. Bleed the hydraulic system (paragraph 5-40.65).

5-40.58 Adjust Gear Limit Switches (S22a and b).

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
Metric Feeler Gage (1.5 mm)

WARNING

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

a. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

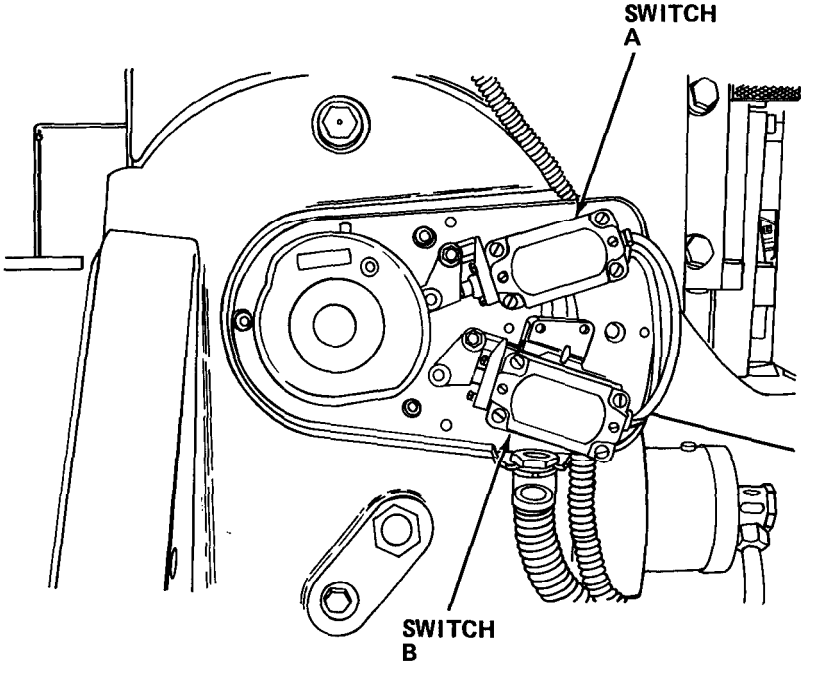
(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove cover from the limit switches.

c. Perform manual knife carrier movements, paragraph 5-36.21 steps b. through h. to ensure that knife is at highest position.

d. On limit switch labeled "B", check that the maximum movement left in the activation of the switch is .06 in. (1.5 mm). Loosen screws on the switch and adjust as necessary.



e. Rotate the handles so that limit switch labeled “A” is fully activated by the cam (this step lowers knife carrier to lowest position).

f. Check that the maximum movement left in the activation of the switch is .06 in. (1.5 mm). Loosen screws on the switch and adjust as necessary.

g. Reinstall limit switch cover.

h. Perform manual knife carrier movements, paragraph 5-36.21 steps h. through m.

i. Place operator key back into safety lock.

5-40.59 Adjust Clamp Proximity Switch (b29).

MOS: 35E, Special Electronic Devices Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS : Flat Tip Screwdriver
10 mm Combination Wrench

a. Remove front electronics enclosure cover.

b. Remove left side of plastic top cover.

c. Using operator key, unlock the safety lock.

d. Turn on power.

(1) Turn main power switch to I position.

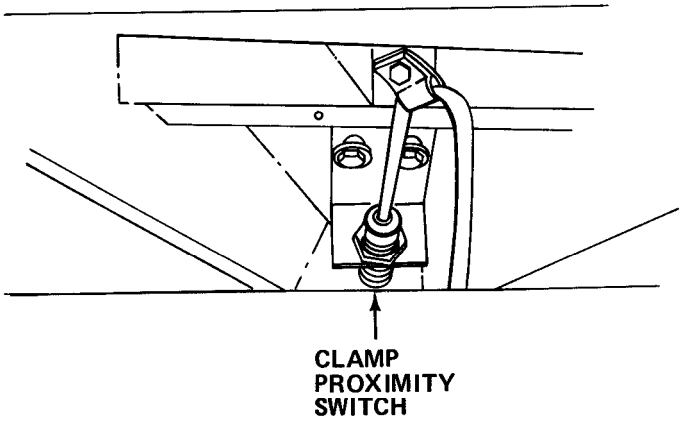
(2) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn the switch to △ position.

(3) Press control power on switch.

e. Move backgauge forward or backward as required until backgauge position is displayed on the measurement display.

WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.



f. Move the clamp proximity switch up or down as necessary so that LED V5 on circuit board IAR comes on.

NOTE

Be sure not to lower the proximity switch on top of clamp.

g. Tighten mounting bolts.

h. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock the safety lock.

i. Reinstall top cover on left side and secure with screws.

j. Reinstall front electronics enclosure cover.

5-40.60 Adjust Measurement Display

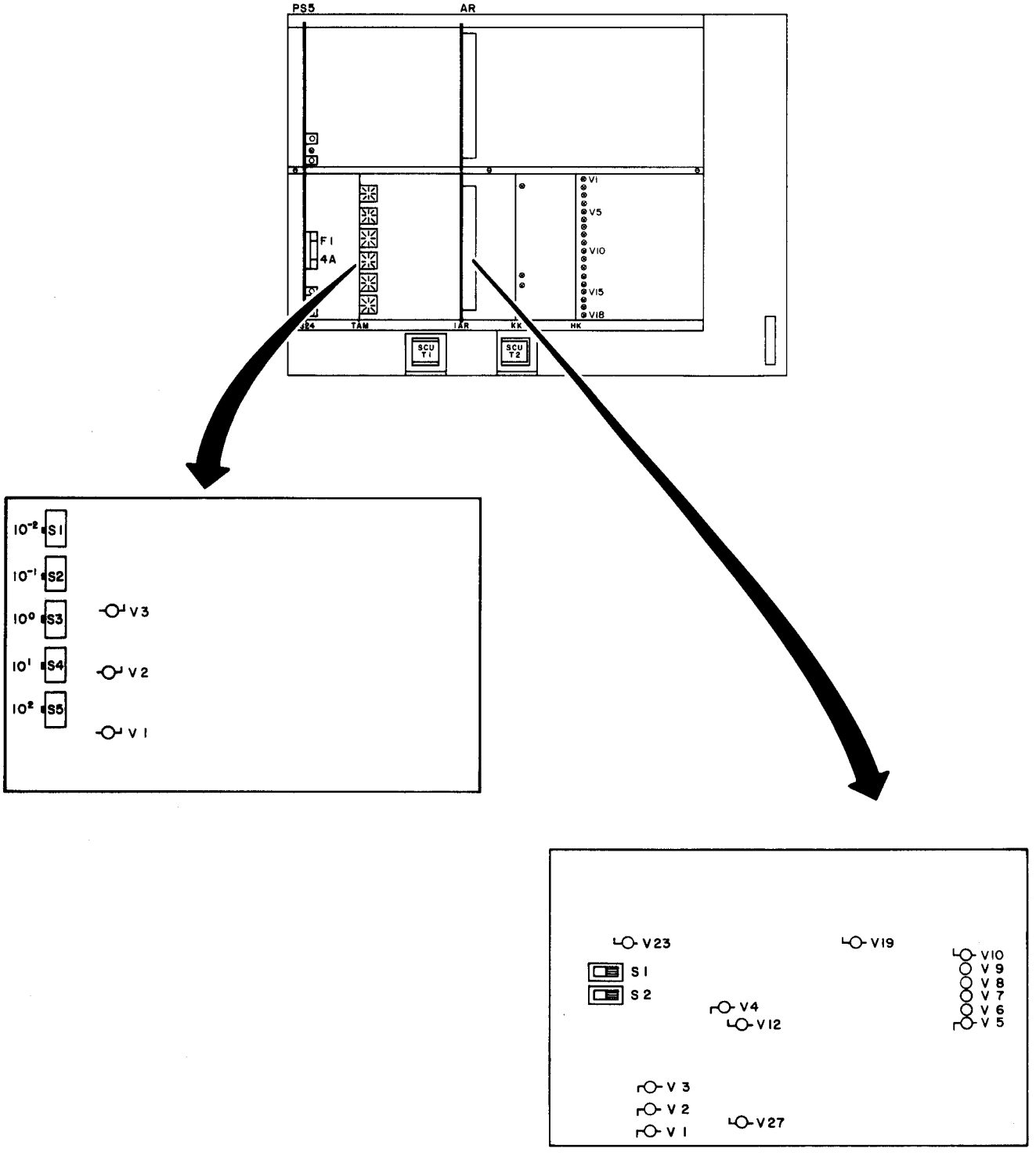
MOS: 35E, Special Electronic Devices Repairer

TOOLS: Metric Caliper
Flat Tip Screwdriver

SUPPLIES: Ream of art paper approximately 2 in. (5.1 cm) in height, 8 in. (20.5 cm) in length and 11 in. (28.2 cm) in width
Rubber Matting

a. Remove front electronics enclosure cover.

b. Locate the IAR board and place switch S2 in the metric mode and switch S1 in the cm mode.



c. Record the readings on the adjustment dials of the TAM board.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

d. Turn on power.

(1) Turn on circuit breaker.

(2) Using operator key, unlock safety lock.

(3) Turn main power switch to I position.

(4) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position.

(5) Press control power on switch.

e. Move backgauge forward or backward as required until backgauge position is displayed on measurement display.

NOTE

- Ream of paper must be even on all sides.
- Backgauge must be properly adjusted to be sure that measurements are made correctly (paragraph 5-36.15).

f. Place ream of paper onto cutting table and position backgauge so that measurement display reads 25.00 or any whole number. Be sure paper is fitted tightly against the backgauge.

g. Using clamp foot pedal, lower clamp onto paper.

h. Pressing both cutting buttons, cut paper.

i. After the knife has risen, release the clamp foot pedal.

j. Remove paper under clamp and measure its width using the pocket caliper.

k. If the measurement is larger than the displayed measurement, add the difference to the recorded adjustment dial readings obtained in step c.

l. If the measurement is smaller than the displayed measurement, subtract the difference from the recorded adjustment dial readings obtained in step c.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

m. Locate the TAM circuit board and change the dial readings to the new number obtained in step k. or l.

n. Repeat steps f. - l., decreasing the cut by a whole number each time until proper adjustment is obtained.

o. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock the safety lock.

p. Reinstall front electronics enclosure cover.

5-40.61 Adjust Safety Bolt Proximity Switches (SB.A and SB.E).

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
13 mm Combination Wrench
Metric Feeler Gage (0.8 mm)

WARNING

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

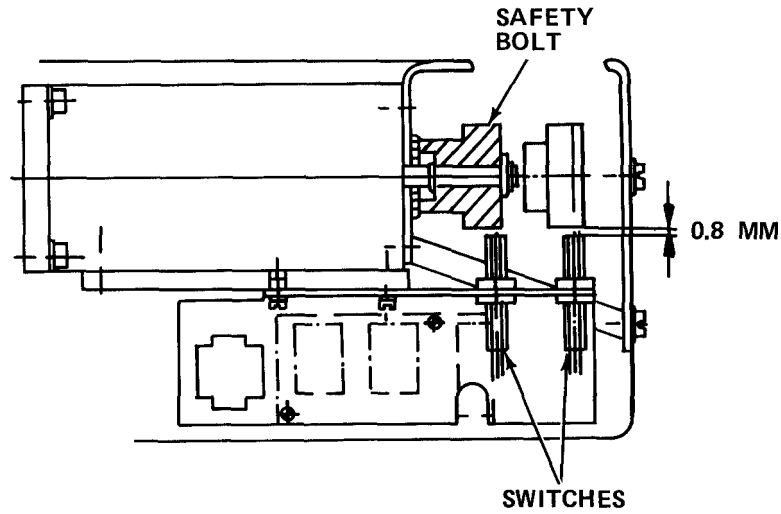
a. Turn off power.

(1) Turn Star-Delta switch to Y posi tion, then to O position.

(2) Turn main power switch to O posi tion.

(3) Using operator key, lock safety lock and keep key in your possession.

b. Remove safety bolt cover.



c. Check the distance between the proximity switches and the safety bolt with the feeler gage. The distance should be 0.8 mm (.03 in.). If not, adjust switches as follows:

(1) Loosen switch locking nuts and move switch in or out until 0.8 mm (.03 in.) clearance is obtained.

(2) Tighten locking nuts.

d. Reinstall safety bolt cover.

e. Place operator key back into safety lock.

5-40.62 Adjust Light Barrier.

MOS: 35E, Special Electronic Devices Repairer

PERSONNEL: Two persons are required to perform this procedure.

TOOLS : Digital Multimeter
Flat Tip Screwdriver
No. 0 Cross Tip Screwdriver

SUPPLIES: Rubber Matting

a. Turn on power.

(1) Turn on circuit breaker.

(2) Using operator key, unlock safety lock.

(3) Turn main power switch to I position.

(4) Turn Star-Delta switch to Y position. After main motor is at full speed, turn switch to △ position.

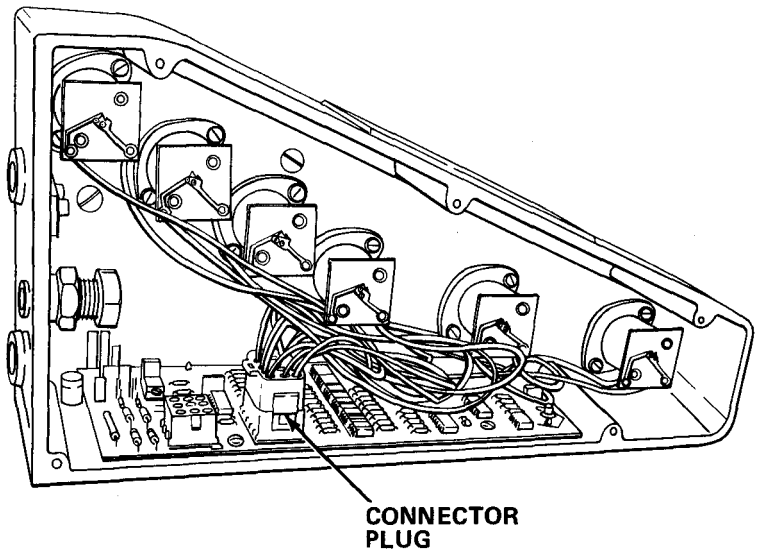
(5) Press control power on switch.

b. Move backgauge forward or backward as required until backgauge position is displayed on measurement display.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

c. Remove side covers on both light barri er housings.



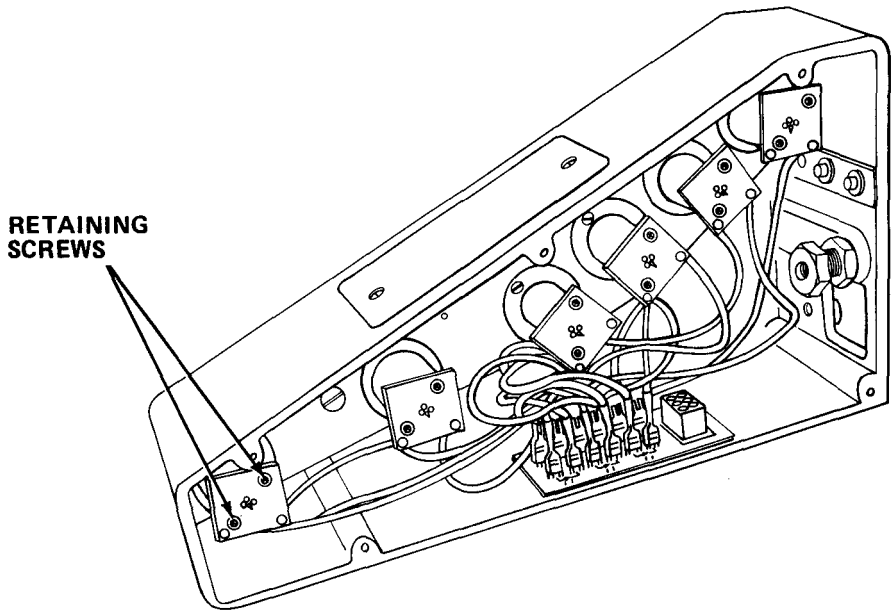
d. Connect multimeter to pins in connector plug for receiver being adjusted.

e. Set multimeter to AC. Voltage reading should be 150 millivolts minimum.

f. If voltage is less than 150 millivolts, proceed to step h.

g. Repeat steps d through f for remaining receivers. If this was the last receiver, proceed to step i.

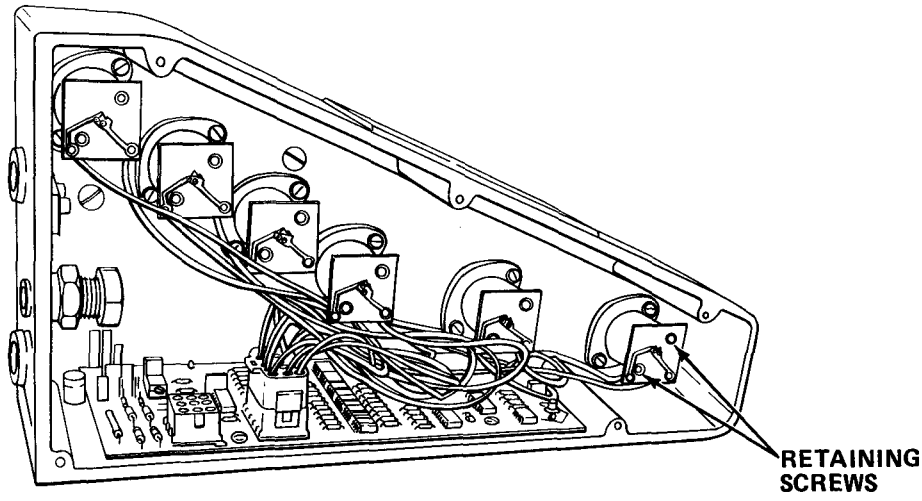
h. Adjust emitter and/or receiver as follows:



(1) Loosen retaining screws on emitter diode associated with failing receiver.

(2) While observing multimeter, move emitter diode until maximum reading is obtained on multimeter, then tighten retaining screws.

(3) If reading is still below 150 millivolts, continue. If reading is above 150 millivolts, repeat steps e. through g. for remaining receivers.



(4) Loosen retaining screws on receiver being adjusted.

(5) While observing multimeter, move receiver until maximum reading is obtained; then tighten retaining screws.

(6) Repeat steps d. through f. for remaining receivers.

i. Reinstall light barrier side covers.

j. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock safety lock.

5-40.63 Adjust Power Supplies.

MOS: 35E, Special Electronic Devices Repairer

TOOLS: Flat Tip Screwdriver
Digital Multimeter

SUPPLIES: Rubber Matting

a. Turn on power.

(1) Using operator key, unlock safety lock.

(2) Turn main power switch to I position.

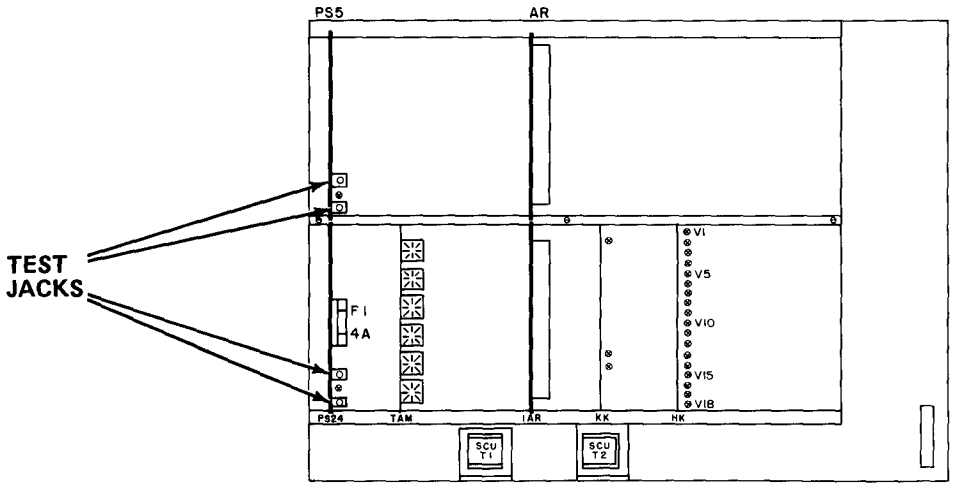
(3) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position.

(4) Press control power on switch.

WARNING

Electrical shock hazard. You must stand on rubber matting as a protective measure before performing this procedure. Death or serious injury may occur.

b. Remove front electronics enclosure cover.



c. On circuit board PS5, insert the positive lead of multimeter into the red jack, and the negative lead into the blue jack.

d. With the adjusting screw, adjust power supply for an output of +5.1 V ±0.02 V.

e. On circuit board PS24, insert the positive lead of multimeter into the red jack, and the negative lead into the blue jack.

f. With the adjusting screw, adjust power supply for an output of +24 V ± 0.2 V.

g. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

h. Reinstall front electronics enclosure cover.

5-40.64 Adjust Clamp Guiding.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: 9 mm Combination Wrench
19 mm Socket with 3/8 in. Drive
3/8 in. Drive Ratchet

SUPPLIES: Spacer Foils

a. Turn on power.

(1) Using operator key, unlock the safety lock.

(2) Turn main power switch to I position.

(3) Turn Star-Delta switch to Y position. After the main motor has reached full speed, turn the switch to △ position.

(4) Press the control power on switch.

b. Move the backgauge forward or backward as required until backgauge position is displayed on measurement display.

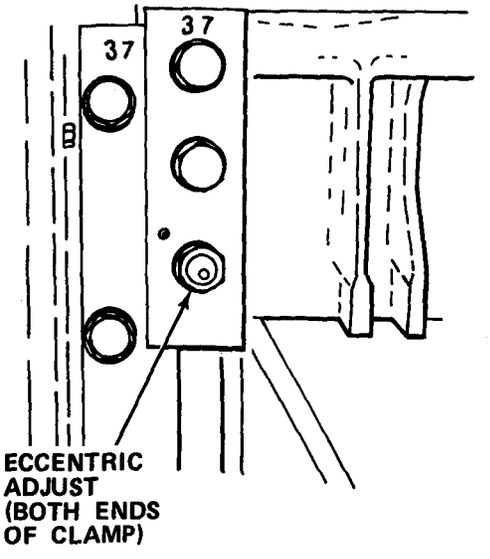
c. Pull out the clamp pressure adjustment knob.

d. Using the clamp foot pedal, lower the clamp onto the table.

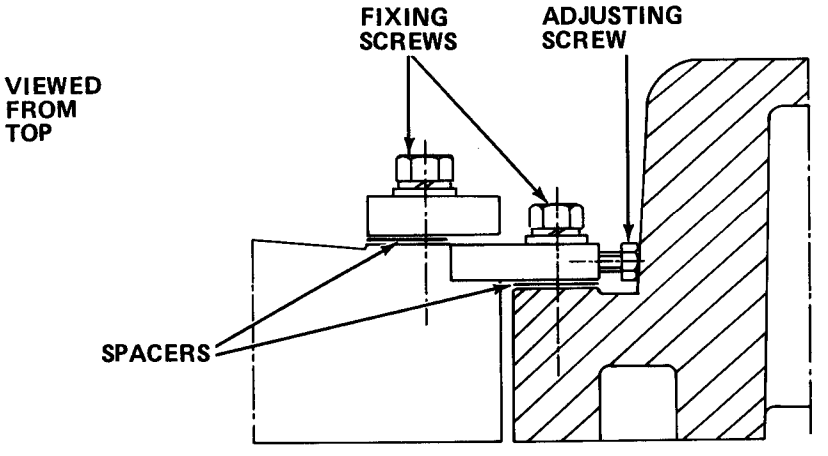
WARNING

Always keep clear of moving parts while performing this task. Serious injury may occur.

e. Be sure that the clamp is parallel to the table. If not, adjust eccentrics to make the clamp parallel.



f. Press in the clamp pressure adjustment knob. Perform several clamping operations using the foot pedal. If the guiding of the clamp is still too stiff, continue, if not go to step l.



g. Add foils behind the guiding plate until the clamp moves freely without play.

h. Adjust the side ledge by loosening the fixing screw and rotating the adjusting screw, then tighten the fixing screw.

i. Perform several clamping operations using the foot pedal. Check for drag marks on the clamp surface along the side ledge. If present, add foils behind the side ledge.

j. If foils were added, continue or go to step l.

k. Check the clearance between the knife and the clamp by performing procedure 5-40.17.

l. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

5-40.65 Bleed the Hydraulic System.

MOS: 83FJ6, Reproduction Equipment Repairer

TOOLS: Flat Tip Screwdriver
Offset Flat Tip Screwdriver
22 mm Combination Wrench
10 mm Combination Wrench
13 mm Socket with 3/8 in. Drive
3/8 in. Drive Ratchet
5 mm Hex Head Key Wrench
Flashlight

SUPPLIES: Rags (Item 21, Appendix E)
Small Oil Drip Pan

NOTE

Steps a. through f. are completed with power off.

a. Remove front electronics enclosure cover.

b. Remove right pillar cover.

c. Remove bolts and hydraulic system cover plate.

d. Remove clamp piston cover plate.

e. Protect MC unit from possible hydraulic fluid splash.

f. Place rags around clamp piston housing to protect it from possible hydraulic fluid splash.

g. Turn on power.

(1) Using operator key, unlock the safety lock.

(2) Turn main power switch to I position.

(3) Turn Star-Delta switch to Y position. After main motor has reached full speed, turn switch to △ position.

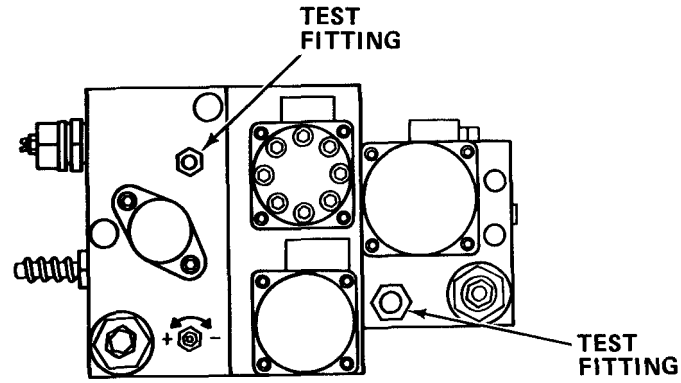
(4) Press control power on switch.

h. Move the backgauge forward or backward as required until the backgauge position is displayed on measurement display.

WARNING

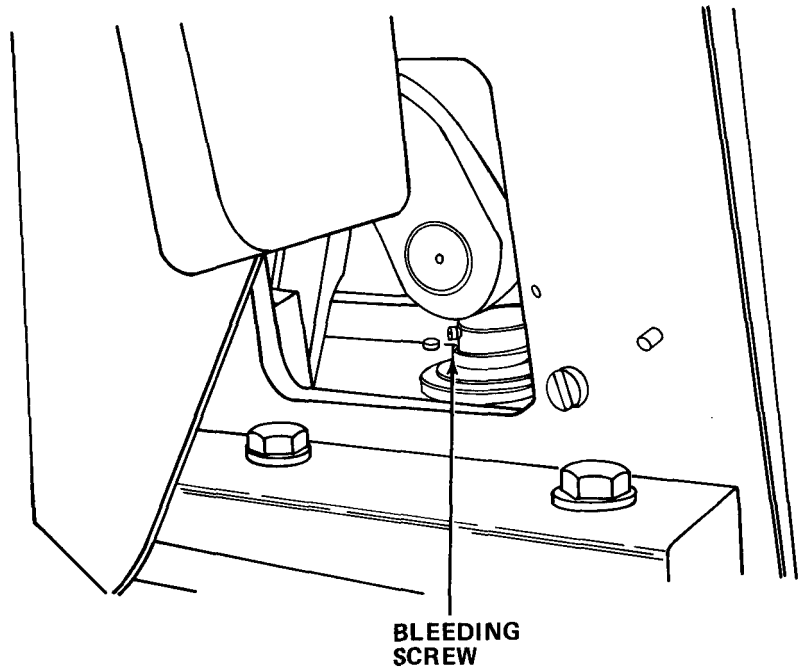
Be sure personnel and foreign materials are clear of the cutting and clamping area before pressing the cutting buttons. Death or serious injury may occur.

i. Perform three cutting cycles.



j. Loosen the capnut on the test fitting for the P1 block.

k. Press the ball away from the seating. Fluid should flow out until it is not foamy. Immediately retighten the capnut.



l. On the clamp piston locate the bleeding screw and rotate the piston so that easy access to the bleeding screw is obtained.

m. Barely loosen the screw so that slow bleeding occurs. Do not allow fluid to enter control panel and wires.

WARNING

Keep hands clear of piston when operating the foot pedal. The piston will raise and injury may occur.

n. Press down on the clamp foot pedal and hold.

o. Using a drip pan, let the fluid flow out of the bleeding screw with the piston in the out position until it is free of air bubbles.

p. Retighten the bleeding screw.

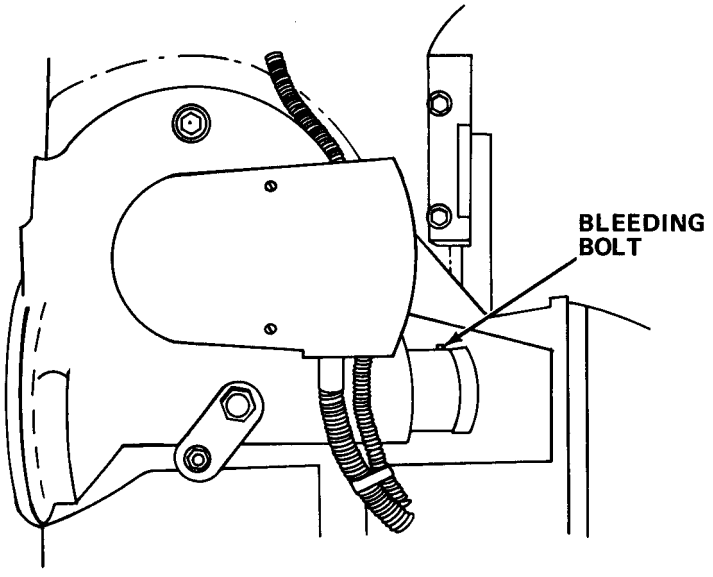
WARNING

Before releasing the clamp foot pedal, be sure all objects are clear of piston and angle linkage. Serious injury may occur.

q. Release the clamp foot pedal.

r. Rotate piston so that the bleeding screw is back in its original position.

s. While performing a cutting cycle, loosen the bleeding bolt on the backside of the clutch assembly during the knife downstroke to bleed hydraulics.



t. Tighten the bolt during the upstroke of the knife.

u. Repeat steps s and t until no more air bubbles are present in the hydraulics.

v. During a cutting cycle, loosen the capnut on the P2 block.

w. Press the ball away from the seating so that fluid can flow out until it is free of air bubbles.

x. Retighten capnut.

y. Using a flashlight, check the fluid inside the pillar for air bubbles.

z. If air bubbles or foam are present, this is an indication of a leaking pipe or fitting. Retighten fittings.

aa. Turn off power.

(1) Turn Star-Delta switch to Y position, then to O position.

(2) Turn main power switch to O position.

(3) Using operator key, lock the safety lock.

ab. Remove all rags around underside of cutter.

ac. Reinstall clamp piston cover plate.

ad. Reinstall hydraulic system cover plate and secure with bolts.

ae. Reinstall right pillar cover.

af. Reinstall front electronics enclosure cover.

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By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

DONALD J. DELANDRO
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-25A Operator's, Organizational, Direct Support and General Support Maintenance Requirements for Finishing Section, Topographic Support System, Model ADC-TSS-16 (TM 5-3610-253 Series).

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PFC JOHN DOE
COA, 3d ENGINEER BN
FT. LEONARDWOOD, MO 63108

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 5-3610-253-14-1	3 Sep 85	Topographic Support System Finishing Section

BE EXACT . . . PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO
6	2-1 a		
B1		4-3	
125	line 20		

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

In line 6 of paragraph 2-1a the manual states the engine has 6 Cylenders. The engine on my set only has 4 Cylenders. Change the manual to show 4 Cylenders.

Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please correct one or the other.

I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered, so the NSN is wrong. Please give me a good NSN

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
JOHN DOE, PFC (268) 317-7111

SIGN HERE: John Doe
JOHN DOE

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C