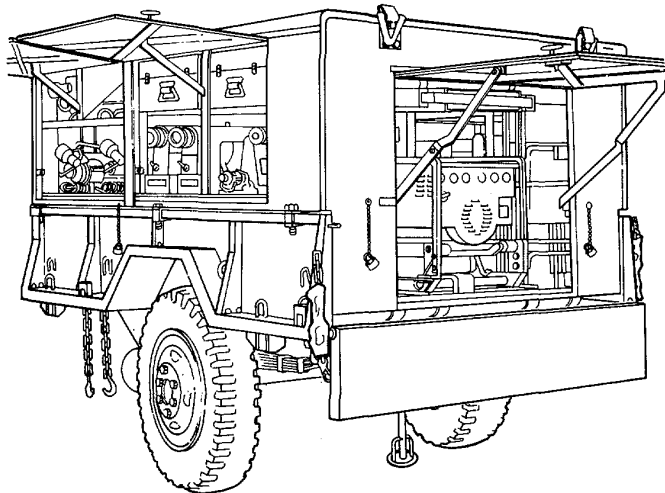


**TECHNICAL MANUAL
OPERATOR'S, ORGANIZATIONAL
AND
DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL
FOR
CLOTHING REPAIR SHOP, TRAILER MOUNTED
MODEL: CRS
NSN: 3530-01-133-3494**



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No. 2 }

TM 10-3530-205-14
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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 21 March 1988

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

CLOTHING REPAIR SHOP, TRAILER MOUNTED
MODEL: CRS
NSN: 3530-01-133-3494

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Maintenance Manual forCLOTHING REPAIR SHOP, TRAILER MOUNTED
MODEL: CRS, NSN: 3530-01-133-3494

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DISTRIBUTION:

To be distributed in accordance with DA Form 12-25A, Operator, Organizational and Direct Support and General Support Maintenance Requirements for Clothing Repair Shop, Trailer Mounted, Model CRS.

WARNING

High voltage is used in the operation of this equipment. Death on contact may result if personnel fail to observe safety precautions. Learn the areas containing high voltage in each piece of equipment. Be careful not to contact high voltage connections when installing or operating this equipment. Before working inside the equipment, turn power off and ground points of high potential before touching them.

For Artificial Respiration, refer to FM 21-71.

WARNING

Remove watches, rings, and all other jewelry while working on or near this equipment. These items could result in injury or death to personnel, or damage to equipment.

WARNING

Do not operate generator set unless ground terminal stud is connected to a suitable ground. Electrical fault in generator set, load lines, or load equipment can cause severe injury or electrocution from contact with ungrounded system.

WARNING

Make connections with all switches in the OFF position, and make sure that the generator set(s) is not operating or commercial electrical power is disconnected before making electrical connections.

WARNING

Deadly fumes are discharged by this equipment in operation. Death by suffocation may result if generator set is operated indoors without exhaust gases being ducted outdoors. Make sure that air intake is free of debris and is large enough not to restrict air flow.

WARNING

Compressed air used for cleaning or drying can create airborne particles that may enter the eyes. Pressure shall not exceed 30 psi (206 kPa). Wearing of goggles is required to avoid injury to personnel.

WARNING

This equipment develops noise which can cause permanent hearing loss if suitable ear protection devices are not worn. Wear ear muffs or ear plugs which were fitted by a trained professional when operating equipment.

WARNING

During operation:

Do not refuel the generator set while it is in operation. Explosion and fire from fuel vapors could result in personal injury and loss of equipment.

Suitable eye protection must be worn while sewing to prevent eyes being injured by broken needles.

Always keep fingers and hands clear of needles while sewing. The needles can cause serious and painful injury to the fingers and hands.

Set the button in the clamp of the button machine so that the buttonholes are centered correctly over the needle plate and straight across the button clamp. This will prevent the needle from striking the button and throwing bits of steel or button in the operator's face.

Do not operate sewing machine with scissors or tools on the table because they could get caught in the belt and be thrown into the air, injuring someone or jamming the machine.

Be sure to turn off sewing machine power source before replacing bobbins or needles. Sewing machines could accidentally start and result in serious injury to fingers or hands.

Disconnect power source, turn off machine power switch, and remove sewing machine belt before performing maintenance or adjustment on machine.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

HOW TO USE THIS MANUAL

CONTENT

This manual is provided for your use in operating and maintaining the Clothing Repair Shop, Trailer-Mounted. You must familiarize yourself with the entire maintenance procedures before beginning the maintenance task. Maintaining the clothing repair shop includes preventive maintenance checks and services, observation of trouble symptoms, troubleshooting procedures, and maintenance procedures to correct a malfunction.

MANUAL OVERVIEW

To help you become familiar with this new kind of manual as quickly as possible, spend some time looking through the pages. The manual has a new look that is different from the look of the manuals you've been using. You'll find that it's a lot easier to use and you'll be able to find what you're looking for faster. In most cases, pictures have replaced words to show you how to operate, inspect, service, replace or repair those items or components that are your responsibility to operate or maintain. The following is a list and description of each chapter and appendix.

a. Chapter 1 - Introduction.

Contains general information, purpose of equipment, equipment description, and technical principles of operation regarding the complete clothing repair shop.

b. Chapter 2 - Operating Instructions.

Contains operating instructions, both under usual and unusual conditions, operation of auxiliary equipment, and preventive maintenance checks and services (PMCS).

c. Chapter 3 - Operator Maintenance Instructions.

Contains lubrication instructions, operator troubleshooting, and maintenance procedures.

d. Chapter 4 - Maintenance of Auxiliary Equipment.

Contains references to technical manuals covering the auxiliary equipment.

e. Chapter 5 - Organizational Maintenance Instructions.

Contains detailed maintenance procedures for the organizational maintenance technician. Also included are instructions for service upon receipt of equipment, and preventive maintenance checks services (PMCS).

f. Chapter 6 - Direct Support Maintenance Instructions.

Contains the maintenance instructions for the clothing repair shop at the direct support maintenance level.

MANUAL OVERVIEW - Continued

g. Chapter 7 - General Support Maintenance Instructions.

Contains the maintenance instructions for the clothing repair shop at the general support maintenance level.

h. Appendix A - References.

Contains a listing of all forms and technical manuals referred to in this manual.

i. Appendix B - Maintenance Allocation Chart (MAC).

Contains a listing of all maintenance significant items and their applicable maintenance functions assigned to each maintenance category.

j. Appendix C - Components of End Item and Basic Issue Items List.

Contains listings for components of the end item, and basic issue items.

k. Appendix D - Additional Authorization List (AAL).

Not Applicable.

l. Appendix E - Expendable/Durable Supplies and Materials List.

Contains an alphabetized tabular listing of all consumable items used in the maintenance or repair of the clothing repair shop.

m. Appendix F - Illustrated List of Manufactured Items.

Contains complete instructions for making items authorized to be manufactured or fabricated at organizational maintenance.

n. INDEX.

Contains an alphabetical index by subject matter contained in this manual.

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT,
AND GENERAL SUPPORT MAINTENANCE MANUAL
FOR
CLOTHING REPAIR SHOP, TRAILER MOUNTED
MODEL NO. CRS
NSN: 3530-01-133-3494

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.

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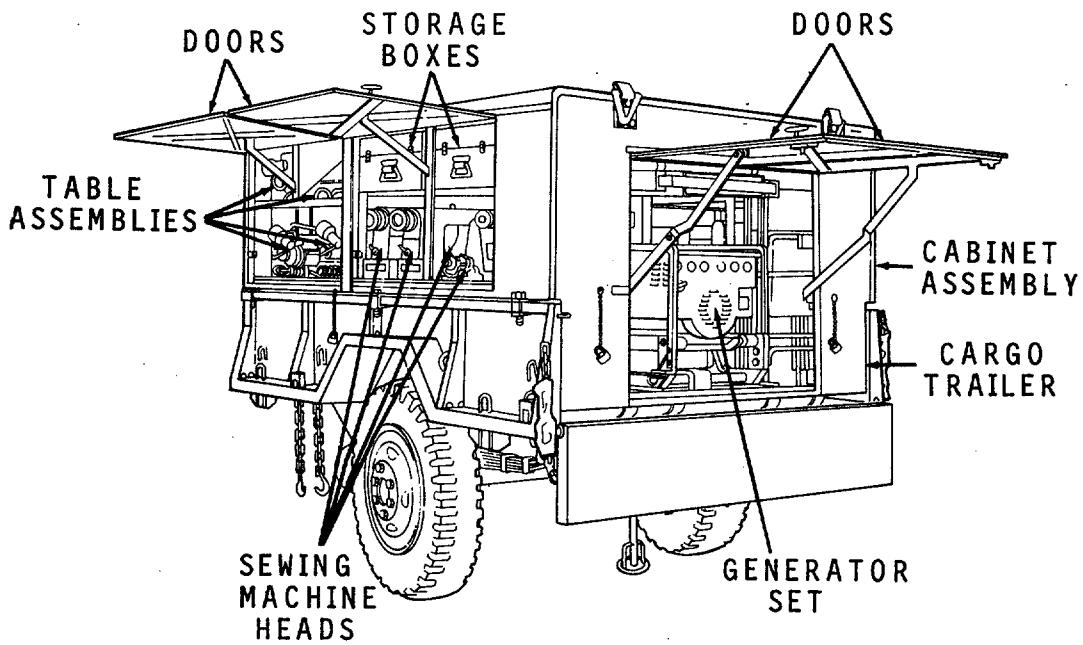
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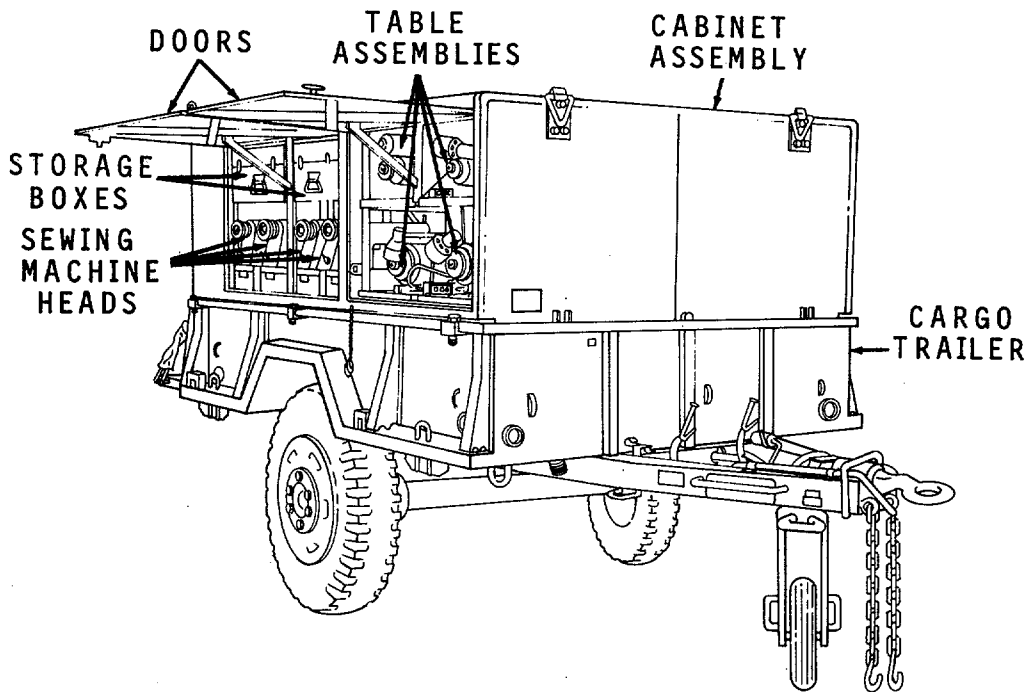
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STREET SIDE



CURB SIDE

Figure 1-1. Clothing Repair Shop, Trailer Mounted.

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION
 Section II. EQUIPMENT DESCRIPTION
 Section III. TECHNICAL PRINCIPLES OF OPERATION

SECTION I. GENERAL INFORMATION

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1-1. SCOPE.

a. *Type of Manual.* Operator's, Organizational, Direct Support, and General Support Maintenance Manual.

b. *Model No. and Equipment Name.* Model CRS clothing repair shop, trailer-mounted, transportable for field use.

c. *Purpose of Equipment.* The clothing repair shop is trailer-mounted (fig. 1-1) and is complete with all equipment including auxiliary and support equipment necessary for the repair of clothing, and is designed for field use where it is normally set up in tents or temporary shelters.

d. *Special Limitations on Equipment.* Rated for 105 Vac to 120 Vac, 60 Hertz input power. Power may be furnished from a Government Furnished Equipment (GFE) generator set or from commercial power source.

1-2. MAINTENANCE FORMS AND RECORDS.

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

1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

Command decision, in accordance with the tactical situation, will determine when destruction of the clothing repair shop will be accomplished. For general destruction procedures for this equipment, refer to TM 750-244-3, Procedures for Destruction of Equipment to Prevent Enemy Use.

1-4. PREPARATION FOR STORAGE OR SHIPMENT.

Refer to Chapter 5 for preparation of the equipment for storage or shipment.

1-5. NOMENCLATURE CROSS-REFERENCE LIST.

This listing includes nomenclature cross-references used in this manual.

<u>Common Name</u>	<u>Official Nomenclature</u>
Grommet Press	Press, Grommet and Eyelet Attaching Machine
Tack-Button Attaching Machine	Press, Grommet and Eyelet, Hand Operated
Clothing Sewing Machine	Clothing Machine, Model C765

1-6. LIST OF ABBREVIATIONS.

AAL	Additional Authorization List	mfg	manufacturing
BII	Basic Issue Items	min	minimum or minute
COEIL	Components of End Item List	No.	number(s)
cont	continued	NSN	National Stock Number
DA	Department of the Army	P/N	part number
DS	Direct Support	para.	paragraph(s)
EIRs	Equipment Improvement Recommendations	PMCS	Preventive Maintenance Checks & Services
ES&ML	Expendable Supplies	qty	Quantity
F	Direct Support	RH	right hand
FM	Field Manual	TAMMS	The Army Maintenance Management System
GS	General Support	TB	Technical Bulletin
Hz	Hertz	TM	Technical Manual
LH	left hand	TMDE	Test Measurement and Diagnostic Equipment
LO	Lubrication Order	U/M	unit of measure
MAC	Maintenance Allocation Chart	Vac	Volts alternating current
max	maximum	wt	weight

1-7. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR's).

If your clothing repair shop needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Troop Support. ATTN: AMSTR-QX, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. We'll send you a reply.

SECTION II. EQUIPMENT DESCRIPTION AND DATA

Equipment Characteristics, Capabilities, and Features	Para. 1-8	Equipment Data..... Location and Description of Major Components.....	Para. 1-10 1-9
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1-8. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

- a. Self-contained unit including its operational support items.
- b. Transportable on cargo trailer.
- c. Clothing repair shop may be quickly dismantled from trailer.
- d. Equipment housed in water proof cabinet.
- e. Equipment may be powered by 120 Vac, 60 Hz, Government furnished auxiliary generator set or by 120 Vac, 60 Hz commercial power.

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

a. *General Description.* The trailer-mounted clothing repair shop (figs. 1-2 through 1-5) is complete with all primary and support equipment required for the repair of clothing. The clothing repair shop is transportable and is designed for field use where it is normally set up in a tent or temporary shelters. The clothing repair shop consists of the following major components:

- (1) Cabinet assembly and its support equipment.
- (2) Six clothing sewing machines.
- (3) One darning sewing machine.
- (4) One button sewing machine.
- (5) One tack-button attaching machine.
- (6) One grommet press machine.
- (7) One fire extinguisher.
- (8) One GFE generator set (if required by mission).

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued.

b. Detailed Description. Throughout this manual the term "curb side" means the right side, while the term "street side" means the left side of the clothing repair shop as viewed from the rear of the trailer. The following paragraphs briefly describe each major component of the clothing repair shop.

(1) Cabinet Assembly. The weather-proofed aluminum cabinet assembly (1, fig. 1-2; 1, fig. 1-3) is designed to house and transport all of the equipment required for the operation of the clothing repair shop. It has two swing up doors (2, fig. 1-2; 2, fig. 1-3) on both the curb and street sides, and one swing up door in the rear (3, fig. 1-3) for easy access to the equipment in the cabinet. The cabinet assembly is mounted in the bed of a 1-1/2 ton utility cargo trailer (3, fig. 1-2) and is secured to the trailer bed frame by holddown clamp assemblies (4, fig. 1-2; 4, fig. 1-3). The cabinet assembly contains the following:

(a) Four compartments (two on the curb side and two on the street side) for the storage boxes (5, fig. 1-2 and 5, fig. 1-3), which are used for storing the grommet press, tack button attaching machine, hardware, accessories and attachments necessary for operation of the clothing repair shop.

(b) Eight wooden tray assemblies for stowing the sewing machine heads (6, fig. 1-2 and 6, fig. 1-3).

(c) Eight compartments with slides for the machine table assemblies (7, fig. 1-2 and 7, fig. 1-3).

(d) Four lower compartments, two on each side under the table assemblies for the folding stands (1, fig. 1-5).

(e) One compartment (rear) with slides for the two table assemblies (8, fig. 1-3).

(f) Slide tracks (1, fig. 1-4) in the bottom rear center of the generator set (2, fig. 1-4).

(g) Space on the front curb side of the cabinet for the fire extinguisher.

(h) Space in the rear on each side for the folding chairs (3, fig. 1-4).

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued.

LEGEND:

- 1. Cabinet Assembly
- 2. Door
- 3. Trailer
- 4. Holddown Clamp Assembly
- 5. Storage Box
- 6. Tray Assembly
- 7. Slide Compartments
- 8. Fire Extinguisher

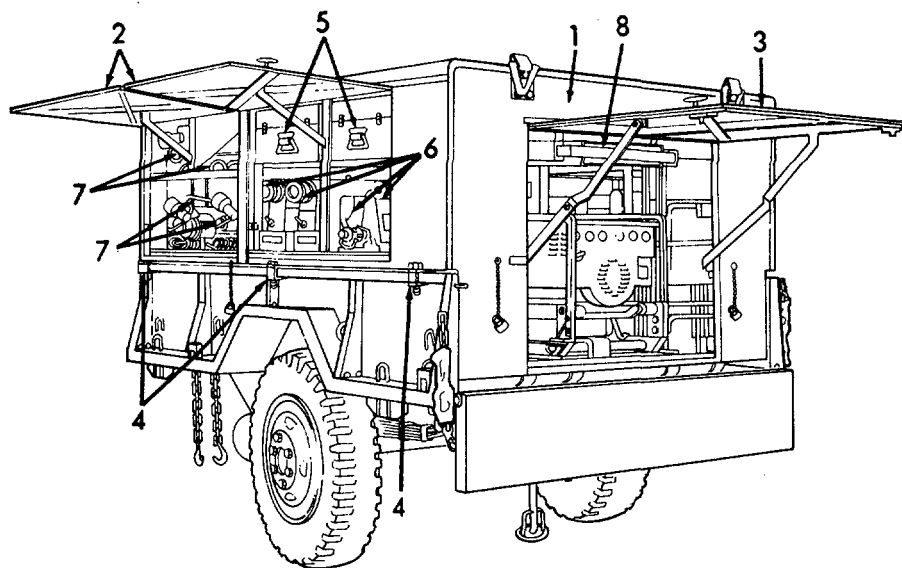


Figure 1-2. Curb Side.

LEGEND:

- 1. Cabinet Assembly
- 2. Door
- 3. Rear Door
- 4. Holddown Clamp
- 5. Storage Box
- 6. Tray Assembly
- 7. Slide Compartments
- 8. Slide Compartment (Rear)

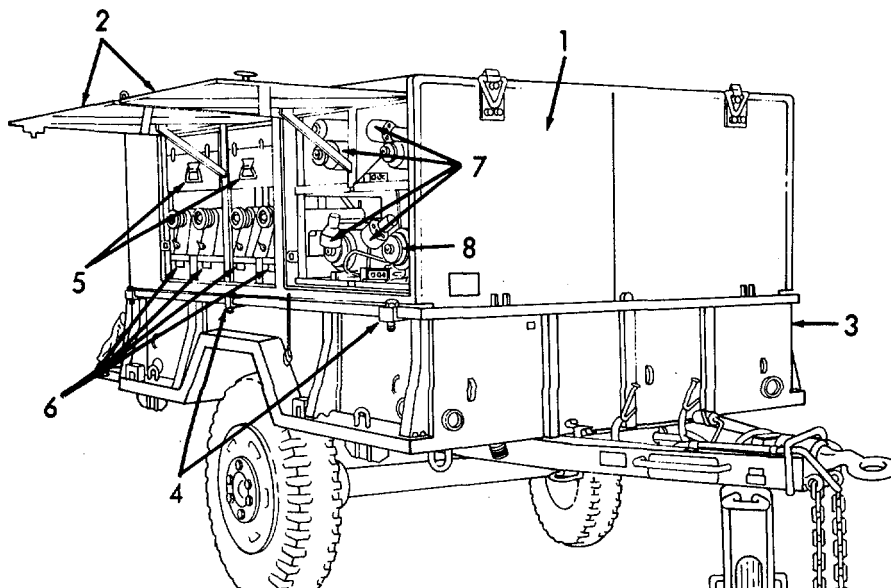


Figure 1-3. Street Side.

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued.

LEGEND:

- 1. Slide Track
- 2. Generator
- 3. Folding Chairs

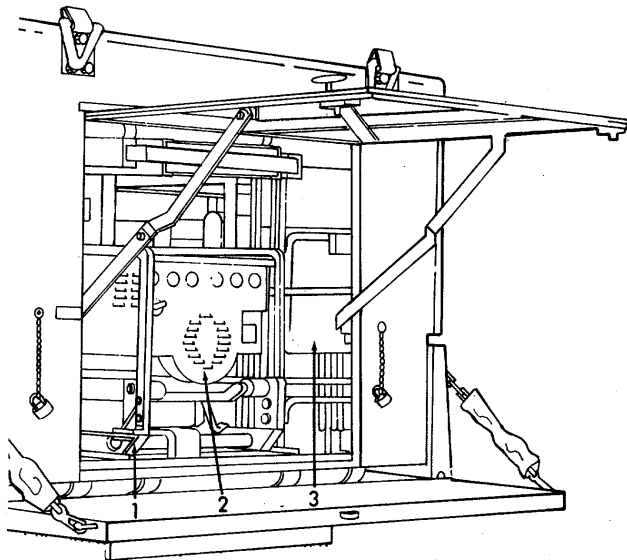


Figure 1-4. Rear View.

LEGEND:

- 1. Folding Stands

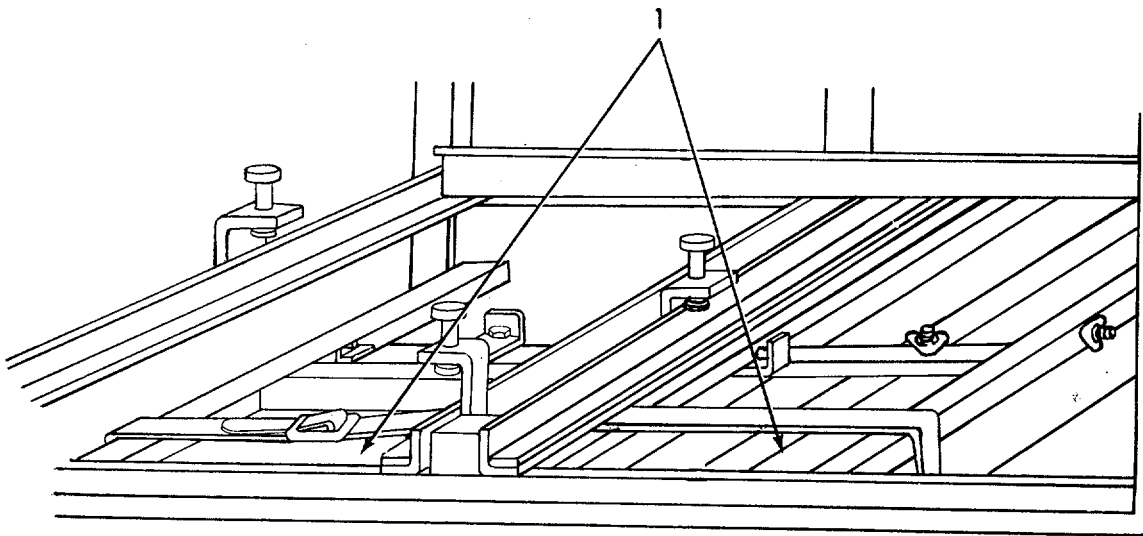


Figure 1-5. Folding Stands.

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued.

b. Detailed Description - Continued.

- (2) Clothing Sewing Machine.
The clothing sewing machine (fig. 1-6) is a single-needle, rotary sewing hook, lockstitch sewing machine, designed for general duty tailoring.

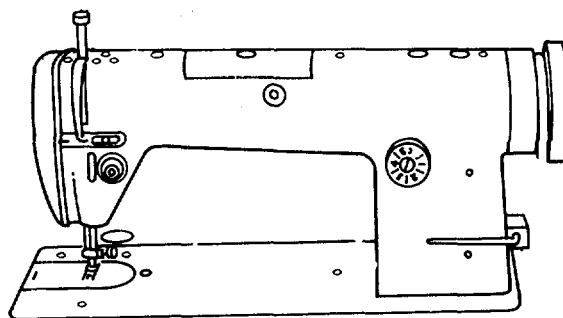


Figure 1-6. Clothing Sewing Machine.

- (3) Darning Sewing Machine.
The darning sewing machine (fig. 1-7) will darn heavy fabrics such as sleeves, legs of trousers, and similar clothing not easily reached by a flat bed machine.

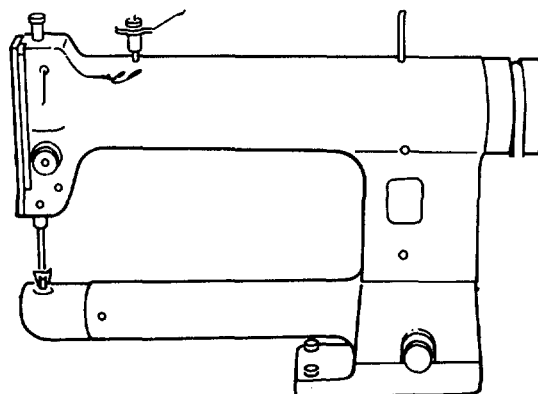


Figure 1-7. Darning Sewing Machine.

- (4) Button Sewing Machine.
The button sewing machine (fig. 1-8) makes a single-thread chain stitch and sews on buttons with sixteen stitches, including a cross-over stitch and a knotting stitch.

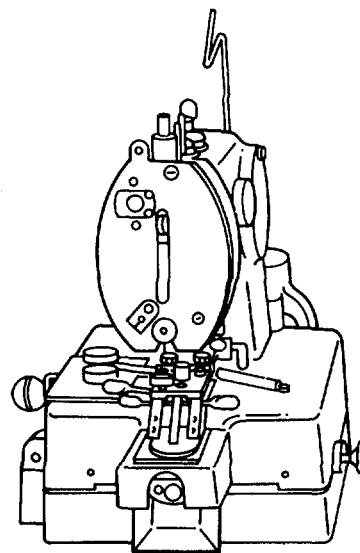


Figure 1-8. Button Sewing Machine.

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued.

b. Detailed Description - Continued.

- (5) Grommet Press. The grommet press (fig. 1-9) is used to attach grommets and snap fasteners.

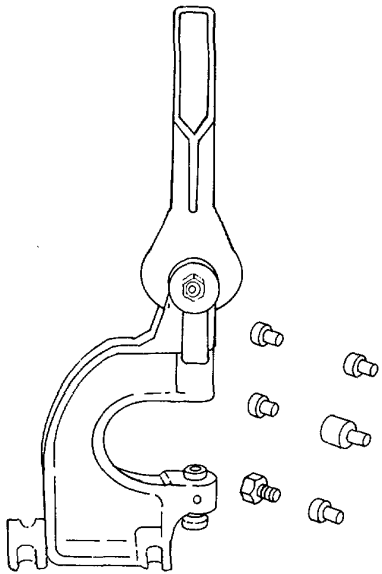


Figure 1-9. Grommet Press Machine.

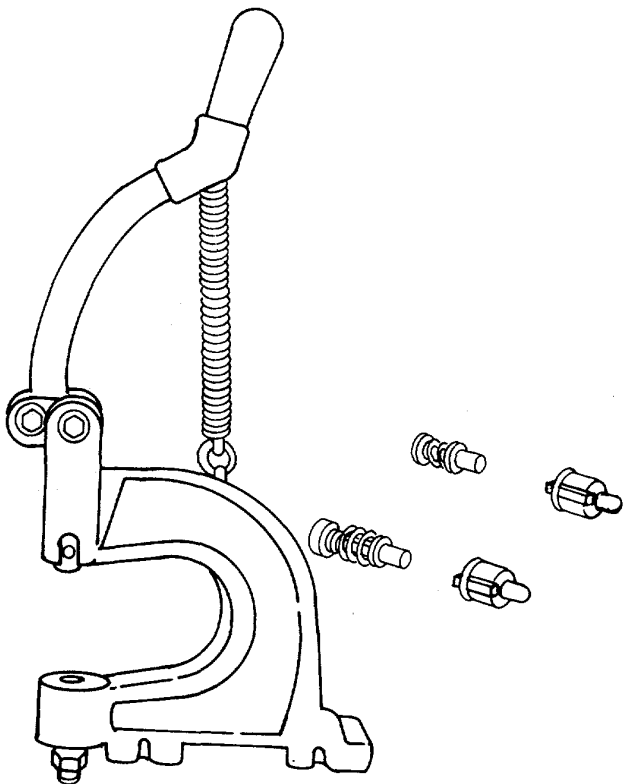
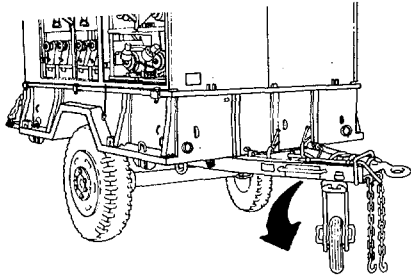


Figure 1-10. Tack-Button Attaching Machine.

- (6) Tack-Button Attaching Machine. The tack-button attaching machine (fig. 1-10) is used to attach tack buttons.

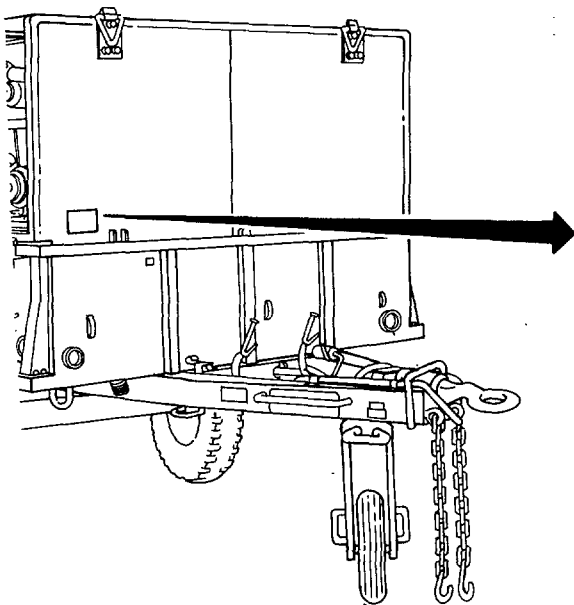
1-10. EQUIPMENT DATA.

a. *Information Plates.* The information plates are affixed to clothing repair shop at various locations. These plates give information, instructions, and identification concerning the components making up the clothing repair shop. These information plates are individually shown in figures 1-11 through 1-17.



CLOTHING REPAIR SHOP TRAILER MOUNTED NATIONAL STOCK NUMBER 3530-01-133-3494 SPECIFICATION No. MIL-C-40153H MFD BY SOUTHWEST TRUCK BODY CO. MFG SERIAL No. [REDACTED] MFG MODEL CRS CONTRACT No. DAAJ09-82-C-A215																							
PUBLICATIONS PARTS LIST TM10-3530-205-24P TECHNICAL MANUAL TM10-3530-205-14 LUBRICATION ORDER LO10-3530-205-12		<table border="1"> <thead> <tr> <th>WEIGHTS</th> <th>SHIPPING</th> <th>CROSSCOUNTRY</th> <th>HIGHWAY</th> </tr> </thead> <tbody> <tr> <td>P/L & BODY</td> <td></td> <td></td> <td></td> </tr> <tr> <td>ON WHEELS</td> <td>5385</td> <td></td> <td>6792</td> </tr> <tr> <td>ON GEAR</td> <td>365</td> <td></td> <td>458</td> </tr> <tr> <td>TOTAL</td> <td>5750</td> <td></td> <td>7250</td> </tr> </tbody> </table>		WEIGHTS	SHIPPING	CROSSCOUNTRY	HIGHWAY	P/L & BODY				ON WHEELS	5385		6792	ON GEAR	365		458	TOTAL	5750		7250
WEIGHTS	SHIPPING	CROSSCOUNTRY	HIGHWAY																				
P/L & BODY																							
ON WHEELS	5385		6792																				
ON GEAR	365		458																				
TOTAL	5750		7250																				
DELIVERY DATE [REDACTED]		INSPECTED [REDACTED]																					
SHIPPING CUBAGE 720																							

Figure 1-11. Identification Plate, Clothing Repair Shop, Trailer Mounted (Mounted on front, street side)



LIFTING INSTRUCTIONS

A SLING (CHAIN OR CABLE) 2 RECD

Figure 1-12. Instruction Plate, Lifting Instructions. (Mounted on front, curb side).

1-10. EQUIPMENT DATA - Continued.

BOX NO. 1

STORE FOLLOWING ITEMS
IN THIS BOX

BUTTON ATTACHING MACHINE WITH DIES
GROMMET PRESS WITH CHUCKS AND DIES
1 - ELECTRIC DISTRIBUTION BOX
NEEDLES, BOBBINS AND HAND IRON

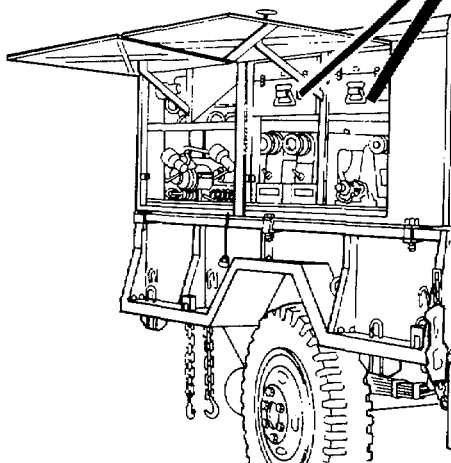
Figure 1-13. Instruction Plate - Box No. 1 Storage List.

BOX NO. 2

STORE FOLLOWING ITEMS
IN THIS BOX

4 DROP LIGHTS
8 SPARE BULBS
GROUND WIRE, 20 FT., NO. 10 WIRE

Figure 1-14. Instruction Plate-Box No. 2 Storage List.

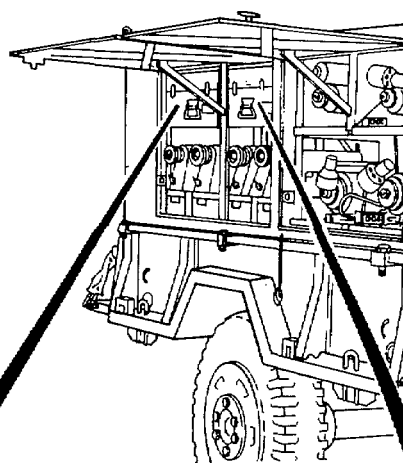


BOX NO. 3

STORE FOLLOWING ITEMS
IN THIS BOX

1 ELECTRIC DISTRIBUTION BOX
7 REST PINS
7 DOUBLE THREAD UNWINDER ASSEMBLIES
1 SINGLE THREAD UNWINDER ASS'Y
7 BASE THREAD UNWINDERS
7 BOBBIN WINDERS
1 BUTTON TRAY
8 BELT ASSEMBLIES
1 ACCESSORIES BOX
4 OIL CANS
2 TREADLES
1 SET OF INSTRUCTION MANUALS

Figure 1-15. Instruction Plate - Box No. 3 Storage List.



BOX NO. 4

STORE FOLLOWING ITEMS
IN THIS BOX

1 ELECTRIC POWER SUPPLY BOX
1 ELECTRIC DISTRIBUTION BOX
2 LIFTER CHAIN ASS'Y'S
1 ROLL OF LEATHER BELTING
1 SLEEVE BOARD AND COVER

Figure 1-16. Instruction Plate-Box No. 4 Storage List.

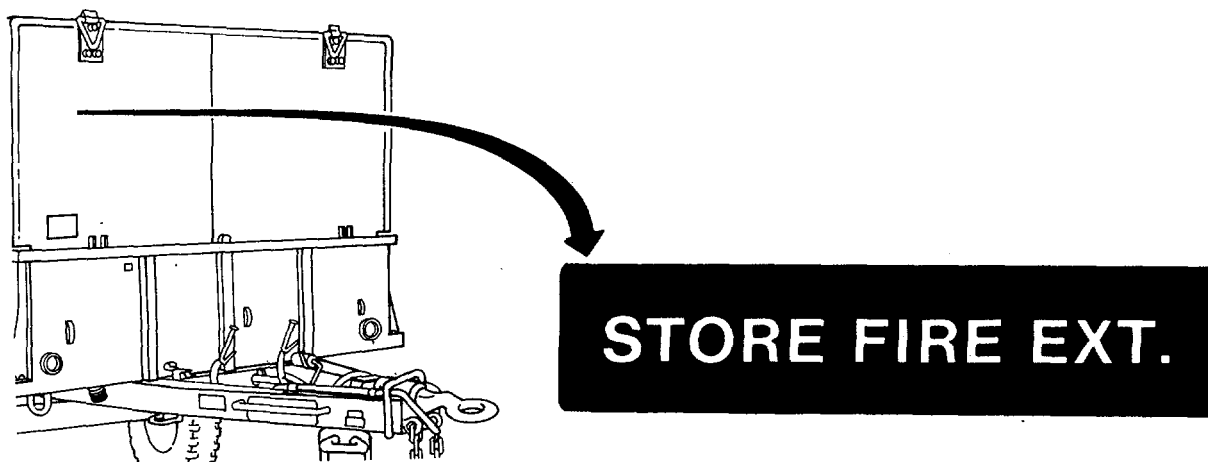


Figure 1-17. Identification Plate Fire Extinguisher Storage
(Mounted on curb side, front).

b. *Equipment Data Listing.* Refer to table 1-1 for a tabulated equipment data on the clothing repair shop. For tabulated data on the cargo trailer refer to TM 9-2330-213-14 and on the generator set refer to TM 5-6115-271-12.

Table 1-1. *Equipment Data*

CLOTHING REPAIR SHOP (OVERALL)

General Information:

Manufacturer	Southwest Mobile Systems St. Louis, Missouri
Manufacturer Model Number	CRS
National Stock Number	3530-01-133-3494

Dimensions and Weights:

Height	90 1/2 inches (229.87 cm)
Length	167 inches (424.18 cm)
Width	83 inches (210.82 cm)
Shipping cubage	722 cubic ft (20.54 cubic meters)
Weight (gross)	5410 lbs (2459.9 kg)
Drawbar height of cargo trailer	29-3/4 to 33-3/4 inches (75.57 to 85.73 cm)

1-10. EQUIPMENT DATA - Continued.*Table 1-1. Equipment Data - Continued.***CLOTHING SEWING MACHINE**General Information:

Manufacturer	Chandler Machine Company
Model Number	C-765
National Stock Number (NSN)	

Motor:

Input power	115V 60 hertz
Horsepower	1/3 hp. (249 w.)
Speed	1750 rpm

DARNING SEWING MACHINEGeneral Information:

Manufacturer	Chandler Machine Company
Model Number	678HD
National Stock Number (NSN)	

Motor:

Input power	115V 60 hertz
Horsepower	1/3 hp. (249 w.)
Speed	1750 rpm

BUTTON SEWING MACHINEGeneral Information:

Manufacturer	Chandler Machine Company
Model number	600
National stock number (NSN)	

Motor:

Input power	115V 60 hertz
Horsepower	1/3 hp. (249 w.)
Speed	1750 rpm

SECTION III. TECHNICAL PRINCIPLES OF OPERATION

Para.			Para.
Button Sewing Machine.....	1-12	Grommet Press	1-14
Clothing Sewing Machine.....	1-11	Tack Button Attaching.....	
Darning Machine	1-13	Machine	1-15

1-11. CLOTHING SEWING MACHINE.

The clothing sewing machine is designed for stitching clothing, coats, suits, skirts, and shirts. Each time the arm shaft rotates, the rotary sewing hook catches the needle thread, loops it around the bobbin thread, and forms a lockstitch. The clutch allows the operator to control the sewing speed.

1-12. BUTTON SEWING MACHINE.

The button sewing machine sews with needle thread only and has no bobbin. It is equipped with a vibrating needle bar and clamp for sewing two and four hole flat buttons.

1-13. DARNING MACHINE.

The darning machine uses a single-needle and rotary sewing hook to make a lockstitch. The presser foot goes up with each stroke of the needle to allow the material to be moved freely in any direction while darning.

1-14. GROMMET PRESS.

The grommet press is a small, hand-operated machine consisting of a metal frame that houses the plunger. The press comes equipped with assorted sets of chucks and dies that are easily interchanged. The chucks are installed in the plunger and dies are installed in the lower portion. When the hand-lever is pushed down, the chuck presses upon the die, molding the separate metal snap fastener parts into the finished fastener and attaching the fastener to the material.

1-15. TACK-BUTTON ATTACHING MACHINE.

The tack-button attaching machine is a small, hand-operated machine consisting of a plunger housed in a metal frame. With a set of dies installed that match the tack-button, the handle is pushed down. The dies press upon the separate button parts into a finished tack button and attach the fastener to the material.

**CHAPTER 2
OPERATING INSTRUCTIONS**

Section I.	DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS
Section II.	OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)
Section III.	OPERATION UNDER USUAL CONDITIONS
Section IV.	OPERATION UNDER UNUSUAL CONDITIONS

SECTION I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

	Para.		Para.
Description and Use of Controls and Indicators.....	2-2	General	2-1

2-1. GENERAL.

This section describes, locates, and illustrates the controls and indicators for you. Enough information about the use of the various controls and indicators is given to help you get the best performance from the clothing repair shop sewing machines. Unload and assemble the equipment in accordance with paragraph 2-9.

2-2. DESCRIPTION AND USE OF CONTROLS AND INDICATORS.

Tables 2-1, 2-2, 2-3, and 2-4 describe the functional use and shows you the location of the controls and indicators on the clothing, darning, button sewing machines, and bobbin winder. These controls and indicators will allow you to get the best performance from the machines if used properly. The "Key" number column in Tables 2-1, 2-2, 2-3, and 2-4 tells you the number of the control or indicator you should look for in the illustration within a particular table. Refer to TM 5-6115-271-14 for information on the controls and indicators for the generator set and to TM 9-2330-213-14 for information on the controls and indicators for the cargo trailer.

Table 2-1. Operator's Controls and Indicators
Clothing Sewing Machine

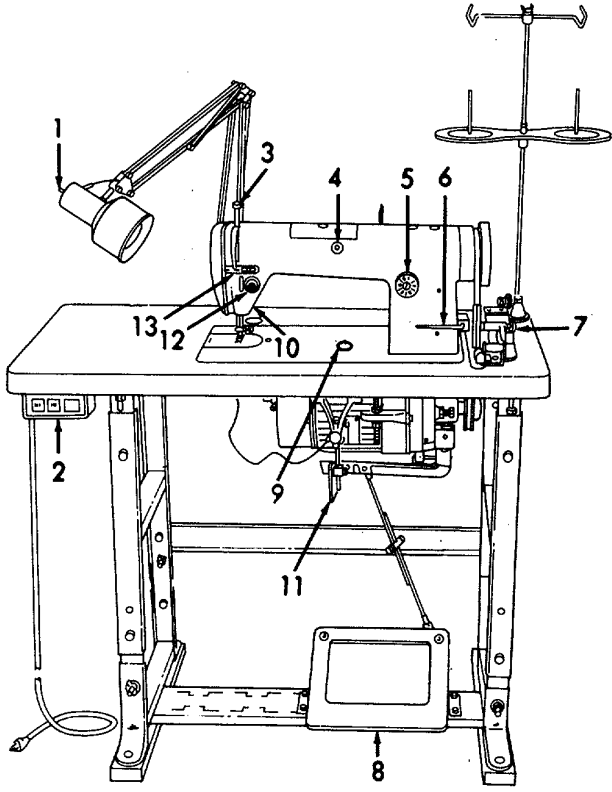
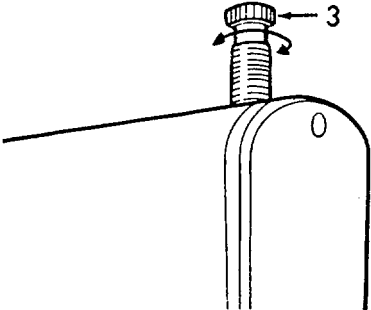
KEY	CONTROL OR INDICATOR	FUNCTION
		
1	Lamp Assembly ON-OFF Switch	Turns the convenience lamp assembly on and off with the motor switch in the on position.
2	Motor Switch	The motor switch applies power to the motor and to the lamp assembly.
3	Pressure Regulator Thumbscrew	The pressure regulator thumbscrew is used to increase or decrease the amount of pressure applied to the presser foot (and on the material). Turning the pressure regulator thumbscrew to the left (counterclockwise) decreases pressure. Turning it to the right (clockwise) increases pressure.

Table 2-1. Operator's Controls and Indicators
Clothing Sewing Machine - (Continued)

KEY
3

CONTROL OR INDICATOR
Pressure Regulator Thumbscrew
(Continued)

FUNCTION



4

Arm Oil Level Sight Gage

Provides a visual indication of the amount of oil in the arm oil tank.

CAUTION

Never operate the machine if oil is not visible in the sight gage window.

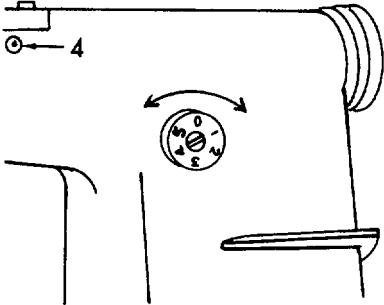
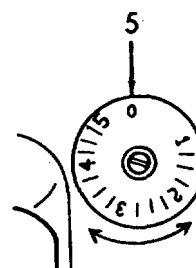


Table 2-1. Operator's Controls and Indicators
Clothing Sewing Machine - (Continued)

KEY	CONTROL OR INDICATOR	FUNCTION
5	Feed Regulator Dial	This control sets the desired stitch length. Detent steps are provided at each graduation for controlling the distance the feed dog pushes the material forward at each needle upstroke. The numbers and graduations on the dial are in millimeter (mm). Rotate the feed regulator dial to the right or left, so the desired stitch length is aligned with the detent pin at the top of the dial.



6	Reverse Feed Lever	
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The reverse lever reverses the direction of feed. For reverse sewing, push and hold the feed lever all the way down. When released, a spring returns the lever to its normal forward stitching position.

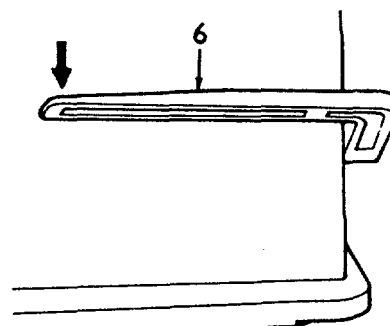
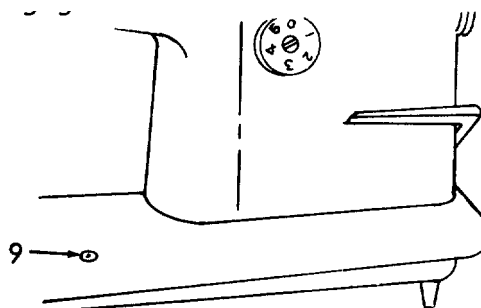


Table 2-1. Operator's Controls and Indicators
Clothing Sewing Machine - (Continued)

KEY	CONTROL OR INDICATOR	FUNCTION
7	Bobbin Winder	The bobbin winder is used to wind bobbins. Refer to Table 2-4 for description.
8	Foot Treadle	The foot treadle engages and disengages the clutch between the motor and the machine pulley. Depress the treadle slowly for smooth clutch engagement. After clutch engagement, depress the treadle further until the desired speed is reached.
9	Bed Oil Sight Gage	Provides a visual indication of the amount of oil in the bed oil tank.

CAUTION

Never operate the machine if oil is not visible in the sight gage window.



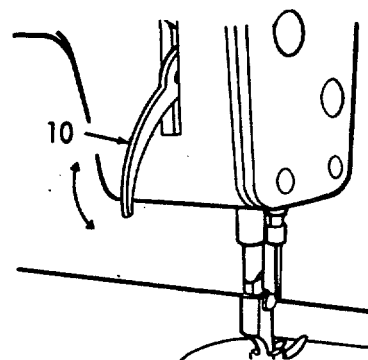
10	Presser Bar Hand Lifter	The presser bar hand lifter is used to raise and to lower the presser foot. To raise and hold the presser foot, pull the hand lifter up into the detent. Push it down to lower the presser foot. Raise the presser foot when inserting, turning, or removing material, and when operating the machine with no material between the presser foot and the feed dog. (For example, when catching the bobbin thread).
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Table 2-1. Operator's Controls and Indicators
Clothing Sewing Machine - (Continued)

KEY
10

CONTROL OR INDICATOR
Presser Bar Hand Lifter (Continued)

FUNCTION



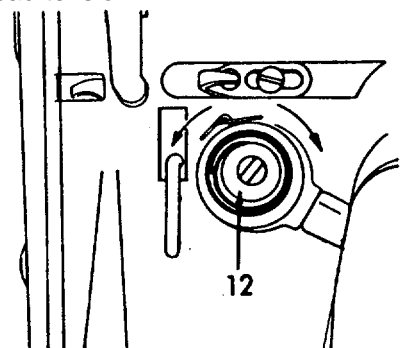
11

Knee Lifter Lever

The knee lifter lever raises the presser bar and will hold the pressure foot up until released. This allows use of both hands to work material.

Table 2-1. Operator's Controls and Indicators
Clothing Sewing Machine - (Continued)

KEY	CONTROL OR INDICATOR	FUNCTION
12	Needle Thread Tension Adjust Nut	Ideal stitches are formed when the needle thread and the bobbin thread are perfectly interlocked at the center of the work material. This is controlled by the needle thread tension which is adjusted by the adjust nut. Turning the nut to the right (cw) increases needle thread tension. Turning the nut to the left (ccw) decreases needle thread tension.



13	Take-Up Thread Guide	
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The thread take-up should be adjusted according to the length of stitches or work material thickness to produce ideal thread tension. When sewing heavy materials, move the take-up thread guide to your left to increase thread take-up. When sewing light weight materials, move the take-up thread guide to your right to decrease thread take-up.

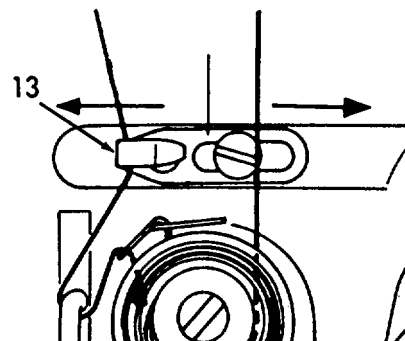


Table 2-2. Operator's Controls and Indicators
Darning Sewing Machine

KEY	CONTROL OR INDICATOR	FUNCTION
1	Lamp Assembly ON-OFF Switch	Turns the convenience lamp assembly on and off. With the motor switch in the on position.
2	Motor Switch	The motor switch applies power to the motor and to the lamp assembly.
3	Pressure Regulator Thumbscrew	The pressure regulator thumbscrew is used to increase or decrease the amount of pressure applied to the presser foot (and the material). Turning the thumbscrew to the left (ccw) decreases pressure. Turning it to the right (cw) increases pressure.

Table 2-2. Operator's Controls and Indicators
Darning Sewing Machine - (Continued)

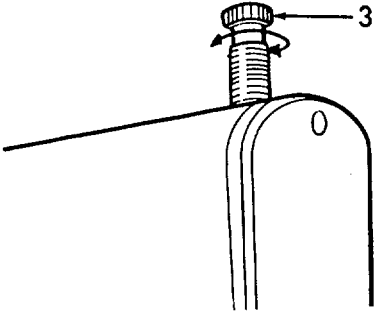
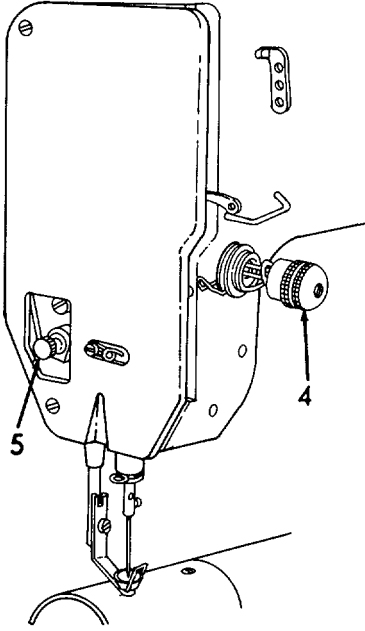
KEY	CONTROL OR INDICATOR	FUNCTION
3	Pressure Regulator Thumbscrew (Continued)	
4	Needle Thread Tension Adjust Nut	<p data-bbox="857 751 1528 930">Ideal stitches are formed when the needle thread and the bobbin thread are perfectly interlocked. The tension exerted on the needle thread can be set by the adjust nut. Turning the nut to the right (cw) increases the needle thread tension. Turning the nut to the left (ccw) decreases the needle thread tension.</p> 

Table 2-2. Operator's Controls and Indicators
Darning Sewing Machine - (Continued)

KEY	CONTROL OR INDICATOR	FUNCTION
5	Presser Foot Adjustment Knob	<p>The presser foot adjustment knob (7) is built into the machine to enable it to work on the heaviest as well as the lightest materials by making only a simple adjustment. The machine is normally adjusted for light to medium work. When heavy work such as nets, coats, blankets, overalls, and aprons are encountered, raise the presser foot by means of the handlifter (5, above) and take hold of the adjustment knob. Pull this knob out and turn it a half turn to the left (counterclockwise); the knob will then-slip into its new position.</p> <p style="text-align: center;">NOTE</p> <p style="text-align: center;"><i>On returning to light work, this knob must be returned to its original position.</i></p>
6	Bobbin Winder	<p>The bobbin winder is used to wind bobbins. Refer to Table 2-4 for description.</p>
7	Foot Treadle	<p>The foot treadle engages and disengages the clutch between the motor and the machine pulley. Depress the treadle slowly for smooth clutch engagement. After clutch engagement, depress the treadle further until the desired speed is reached.</p>

Table 2-2. Operator's Controls and Indicators
Darning Sewing Machine - (Continued)

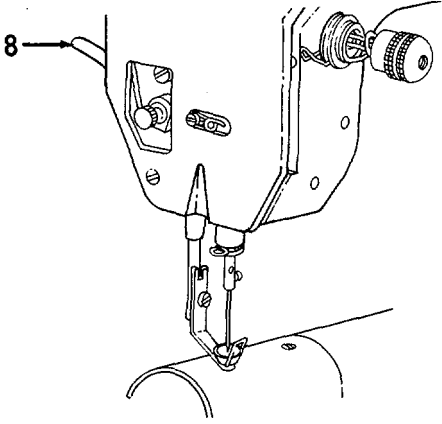
KEY	CONTROL OR INDICATOR	FUNCTION
8	Presser Bar Hand	<p>The presser bar hand lifter is Lifter used to raise the presser bar foot when inserting, turning, or removing material. To raise and hold the presser foot, pull the hand lever up into the detent. Push it downward to lower the presser foot.</p> 

Table 2-3. Operator's Controls and Indicators
Button Sewing Machine

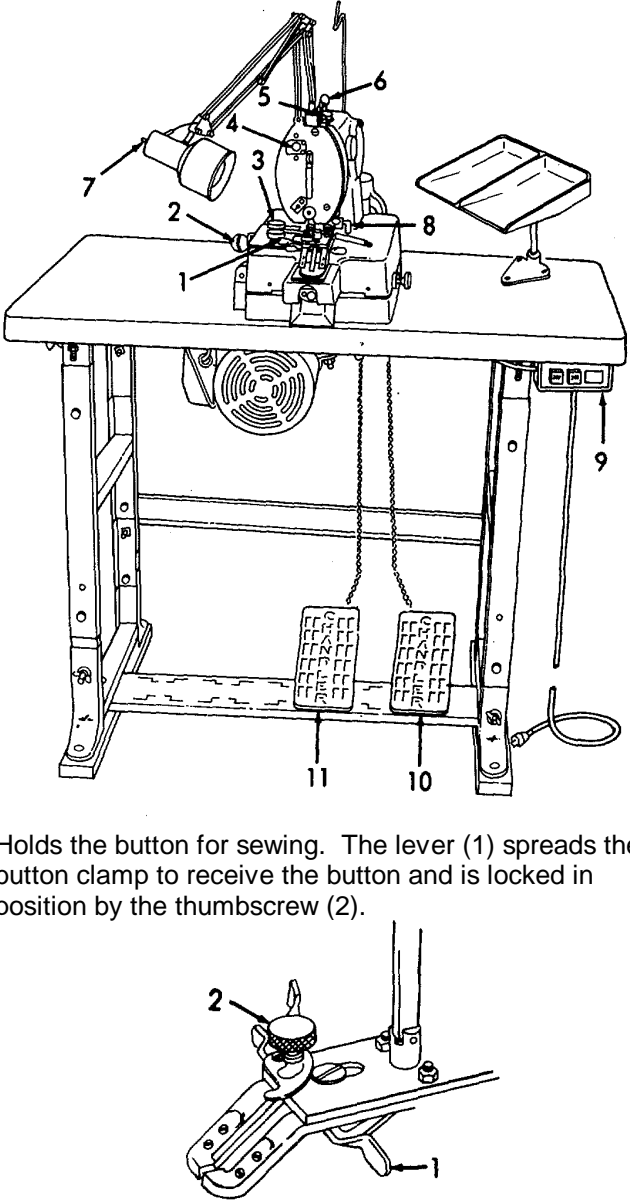
KEY	CONTROL OR INDICATOR	FUNCTION
1	Button Clamp	<p>Holds the button for sewing. The lever (1) spreads the button clamp to receive the button and is locked in position by the thumbscrew (2).</p> 

Table 2-3. Operator's Controls and Indicators
 Button Sewing Machine - (Continued)

KEY	CONTROL OR INDICATOR	FUNCTION
2	Button Clamp Vibration Regulator	Regulates the distance the button clamp will move from left to right. Calibrated in inches (1/16 inch divisions). Lock thumbnut after setting distance.
3	Two-Hole or Four Hole Regulator	Selects two-hole or four-hole button clamp button travel of vibration. Calibrated in inches (1/16 inch divisions).
4	Thread Lock Timing Thumbnut	The thread lock timing thumbnut provides an indication to the operator that the timing plunger is operating. It locks the thread when the sewing cycle is complete.
5	Front Thread Tension Adjust Knob	Tightness of the stitch is regulated by the front tension adjust knob. If the adjustment is too tight, the looper will snap the thread, if it is too loose, the knots on the underside of the button will be loose. Turning the knob to the right (cw) increases thread tension, turning it to the left (ccw) decreases tension.

Table 2-3. Operator's Controls and Indicators
Button Sewing Machine - (Continued)

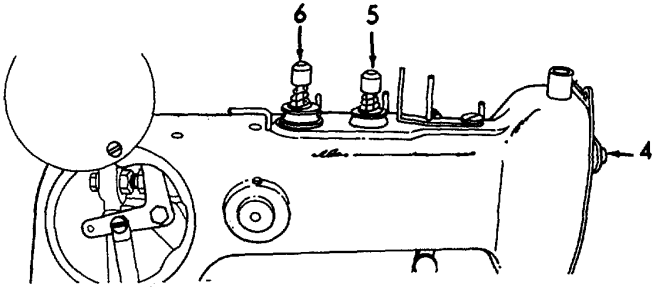
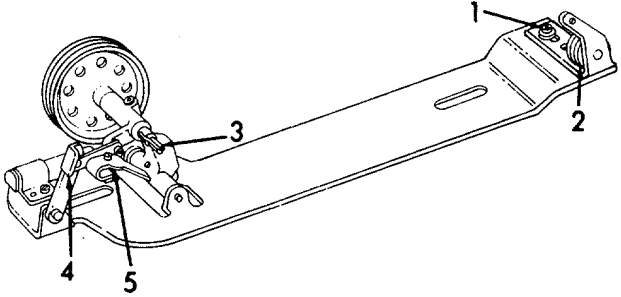
KEY	CONTROL OR INDICATOR	FUNCTION
6	Rear Thread Tension	 <p style="text-align: center;">CAUTION</p> <p><i>To avoid equipment damage, do not disturb or attempt to use rear tension adjust knob for adjustment of normal thread tension. If proper thread tension cannot be obtained by use of front thread tension, adjust knob, notify your supervisor.</i></p> <p>This adjust knob is an intermittent thread locking tension device which locks the thread prior to the end of each stitch. This prevents the looper from stealing thread from the spool instead of pulling up the loop at the end of each stitch.</p>
7	Lamp Assembly ON OFF Switch	Turns the convenience lamp assembly on and off.
8	Hinge Pin	Attaches button clamp assembly to machine bed. Turn and pull to remove hinge pin and button clamp assembly.

Table 2-3. Operator's Controls and Indicators
Button Sewing Machine - (Continued)

KEY	CONTROL OR INDICATOR	FUNCTION
9	Motor Switch	The motor switch applies input power to the motor in the ON position and interrupts input power to the motor in the OFF position.
10	Button Clamp Lifter Treadle	Depression of the treadle lifts the button clamp and cuts the thread from the looper under the needle. Release to lower button clamp.
11	Foot Treadle	Pressing the treadle downward engages the clutch and starts the machine.

Table 2-4. Operator's Controls and Indicators
Bobbin Winder

KEY	CONTROL OR INDICATOR	FUNCTION
<p>1</p> <p>2</p> <p>3</p> <p>4</p> <p>5</p>	<p>Adjusting Screw</p> <p>Thread Tension Disk and Control</p> <p>Bobbin Spindle</p> <p>Thumb Lever</p> <p>Stop Latch</p>	 <p>Used to adjust the thread tension assembly to the left or right for even bobbin winding.</p> <p>Adjusts thread tension for firm thread tension.</p> <p>Holds bobbin during thread winding.</p> <p>After the bobbin has been positioned on the spindle, depress the thumb lever to wind the bobbin. After the bobbin is fully wound, this lever will snap back, throwing the bobbin pulley against its stop.</p> <p>When the bobbin is full, the stop latch trips the thumb lever to stop bobbin winding. The lever is adjusted to control the amount of thread wound in the bobbin.</p>

**SECTION II. OPERATOR PREVENTIVE MAINTENANCE
CHECKS AND SERVICES (PMCS)**

General.....	Para. 2-3	Operator's PMCS Procedure.....	Para. 2-4
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2-3. GENERAL.

- a. Make sure that the equipment of the clothing repair shop is ready for operation at all times. It must be inspected systematically so defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance checks and services (PMCS) that are to be performed by the operator are listed and described in table 2-5.
- b. Refer to TM 5-6115-271-14 for information on the preventive maintenance checks and services (PMCS) for the generator set and to TM 9-2330- 213-14 for information on the preventive maintenance checks and services (PMCS) for the cargo trailer.
- c. Do your Before (B) PREVENTIVE MAINTENANCE just before you operate. Pay attention to the WARNINGS and CAUTIONS.
- d. Do your During (D) PREVENTIVE MAINTENANCE during operation. (During operation means to monitor the clothing repair shop and its components while they are actually being used). Pay attention to the WARNINGS and CAUTIONS.
- e. Do your After (A) PREVENTIVE MAINTENANCE right after operation. Pay attention to the WARNINGS and CAUTIONS.
- f. If something doesn't work, troubleshoot it with the instructions in this manual and notify your supervisor.
- g. Always do your PREVENTIVE MAINTENANCE in the same order so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.
- h. If anything looks wrong and you can't fix it, write it on the DA Form 2404. If you find something seriously wrong, report it to organizational maintenance RIGHT NOW.
- i. If your equipment fails to operate, troubleshoot with proper equipment. Report any deficiencies using the proper forms. See DA PAM 738-750.

2-3. GENERAL - Continued.

- j. When you do your PREVENTIVE MAINTENANCE, always take along the tools you'll need to make all the checks. You'll always need a rag or two.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (1) Keep it clean: Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use cleaning solvent (Appendix E, item 2) on all metal surfaces. Use soap and water when you clean cloth, rubber, or plastic material.
- (2) Bolts, nuts, and screws: Check them all for obvious looseness, missing, bent, or broken condition. You can't try them all with a tool, of course, but look for chipped paint, bare metal, or rust around the bolt and nut heads. If you find one you think is loose, tighten it, or report it to organizational maintenance if you can't tighten it.
- (3) Welds: Look for loose or chipped paint, rust, or gaps where parts are welded to together. If you find a bad weld, report it to organizational maintenance.
- (4) Electric wires and connectors: Look for cracked or broken insulators, bare wires, and loose or broken connectors. Tighten loose connectors and make sure the wires are in good shape.

2-4. OPERATOR PMCS PROCEDURES.

- a. *Purpose.* Your Preventive Maintenance Checks and Services table lists the inspections and care of your equipment required to keep it in good operating condition.
- b. *Interval Column.* The interval column tells you when to perform a certain check or service.
- c. *Procedure Column.* The procedure column of your PMCS table tells you how to do the required checks and services. Carefully follow these instructions. If you do not have the tools, or if the procedure tells you to, have Organizational Maintenance do the work.

2-4. OPERATOR PMCS PROCEDURES - Continued.

d. *Reporting or Correcting Deficiencies.* If your equipment does not perform as required, refer to Chapter 3 under Troubleshooting for possible problems. Report any malfunctions or failures on the proper DA Form 2404, or refer to DA PAM 738-750.

e. *Equipment is not ready/available if:.* This column tells you when and why your equipment cannot be used.

NOTE

The terms ready/available and mission capable refer to the same status: Equipment is on hand and is able to perform its combat missions (See DA PAM 738-750).

Table 2-5. Operator Preventive Maintenance Checks and Services

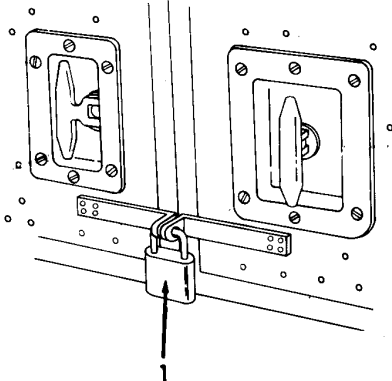
ITEM NO.	INTERVAL			ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF:
	B	D	A		
1	•		•	<p>CABINET ASSEMBLY <i>Padlocks</i></p>  <p>Check for bent, broken or missing padlock (1). Check that padlock keys are not bent and will unlock padlocks. Check that padlocks open and close without binding or sticking. Replace defective padlocks and/or keys.</p>	

Table 2-5. Operator Preventive Maintenance Checks and Services - (Continued)

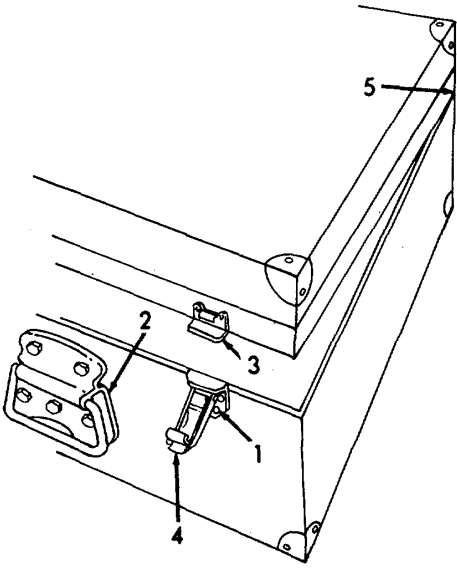
ITEM NO.	INTERVAL			ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF:
	B	D	A		
2	•		•	<p>CABINET ASSEMBLY (Continued) Storage Boxes</p>  <p>Inspect the storage boxes for dirty, cut, dented and broken surfaces.</p> <p>Check for loose or missing rivets (1), and bent, broken, or loose handles (2), hooks (3), latches (4), and hinges (5).</p> <p>Make certain the hooks and latches will lock and unlock, and hinges operate without binding.</p> <p>Notify organizational maintenance if storage box is defective.</p>	

Table 2-5. Operator Preventive Maintenance Checks and Services - (Continued)

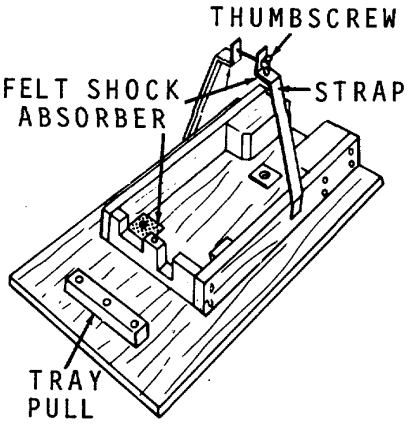
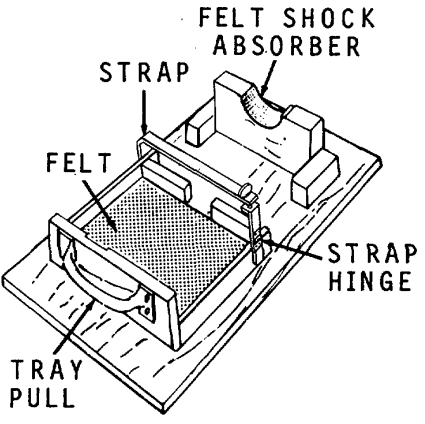
ITEM NO.	INTERVAL			ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF:
	B	D	A		
3	•		•	<p>CABINET ASSEMBLY (Continued) Sewing Machine Tray Assemblies</p>  <p>TRAY ASSEMBLY FOR BUTTON SEWING MACHINE</p>  <p>TRAY ASSEMBLY FOR DARNING SEWING MACHINE</p>	

Table 2-5. Operator Preventive Maintenance Checks and Services - (Continued)

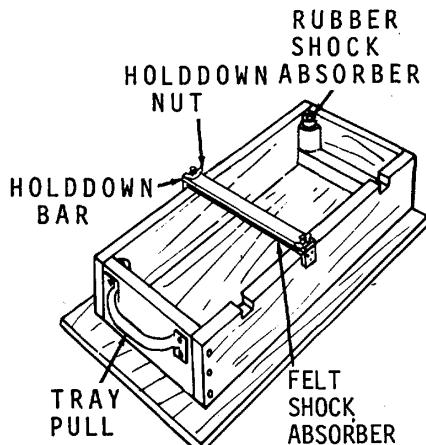
ITEM NO.	INTERVAL			ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF:
	B	D	A		
3				<p>CABINET ASSEMBLY (Continued) Sewing Machine Tray Assemblies - Continued</p>  <p>TRAY ASSEMBLY FOR CLOTHING SEWING MACHINE</p> <p>Inspect the tray assemblies for chipped, cracked, or broken wood.</p> <p>Check for bent or broken holddown straps and pulls.</p> <p>Check for broken, loose, or missing tray, stops and strikers.</p> <p>Check for missing or loose screws throughout.</p> <p>Check for stripped threads on thumbscrews and mating nut on holddown strap.</p>	

Table 2-5. Operator Preventive Maintenance Checks and Services - (Continued)

ITEM NO.	INTERVAL			ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF:
	B	D	A		
3				<p>CABINET ASSEMBLY (Continued) <i>Sewing Machine Tray Assemblies - Continued</i></p> <p>Check for mechanical binding of holddown strap hinges and check for loose or missing screws.</p> <p>Check loose or torn felt shock absorbers and for worn or deteriorated bumpers.</p> <p>Notify organizational maintenance of a defective tray assembly.</p>	

Table 2-5. Operator Preventive Maintenance Checks and Services - (Continued)

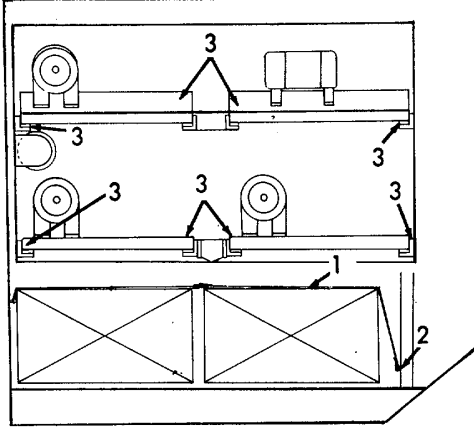
ITEM NO.	INTERVAL			ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF:
	B	D	A		
4	•		•	<p>CABINET ASSEMBLY (Continued)</p> <p><i>Sewing Machine Folding Stand Container Assemblies</i></p>  <p>Inspect the folding stand holddown strap assemblies (1) for cracked, broken, loose or missing footman loops (2), for loose or missing screws; for cut, torn, or frayed webbing straps; for loose or damaged strap buckles; and for loose mounting.</p> <p>Inspect table supports (3) for torn or loose felt pads, damaged holddown clamps, and damaged or missing hardware.</p> <p>Notify organizational maintenance of defective components.</p>	

Table 2-5. Operator Preventive Maintenance Checks and Services - (Continued)

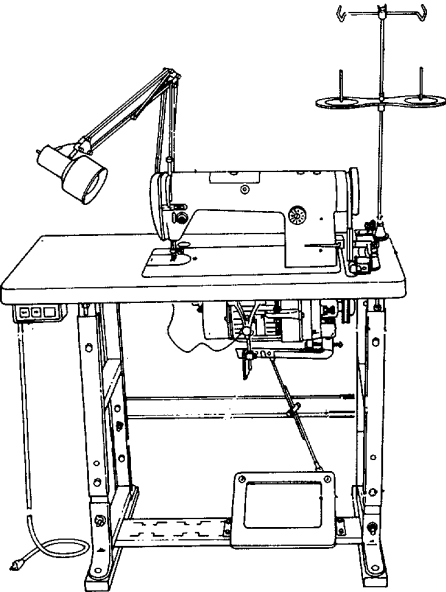
ITEM NO.	INTERVAL			ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF:
	B	D	A		
5	•		•	<p>CLOTHING SEWING MACHINE.</p> <p><i>Table Assembly</i></p>  <p>Inspect for cut, cracked, broken, warped, and dirty tabletop. Inspect for loose or missing bolts and nuts and for bent or broken components. Make certain table assembly is level.</p> <p>Clean a dirty table top and tighten any loose hardware. Level table assembly.</p> <p>Notify organizational maintenance of any other deficiencies.</p>	<p>a. Table assembly is damaged. Components parts or mounting hardware missing or damaged.</p>

Table 2-5. Operator Preventive Maintenance Checks and Services - (Continued)

ITEM NO.	INTERVAL			ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF:
	B	D	A		
6	•		•	<p>CLOTHING SEWING MACHINE (Continued).</p> <p><i>Knee Lifter</i></p> <p>Inspect for loose mounting and for bent or broken knee lifter. Make certain the lifter raises and lowers the presser foot.</p> <p>Notify organizational maintenance of any deficiencies.</p>	
7	•	•	•	<p><i>Machine Service</i></p> <p>a. Inspect the sewing machine for dirt, lint, and other debris.</p> <p>b. Inspect for proper adjustments and operation (para. 2-12).</p>	<p>b. Sewing machine is out of adjustment or fails to operate.</p>

Table 2-5. Operator Preventive Maintenance Checks and Services - (Continued)

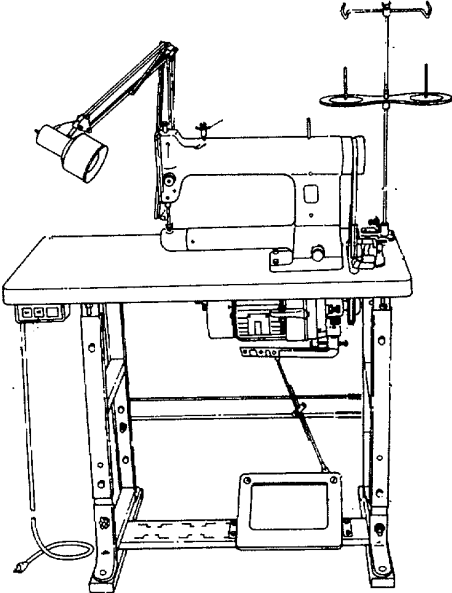
ITEM NO.	INTERVAL			ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF:
	B	D	A		
8	•		•	<p>DARNING SEWING MACHINE.</p> <p><i>Table Assembly</i></p>  <p>Inspect for cut, cracked, broken, warped, and dirty tabletop. Inspect for loose or missing bolts and nuts and for bent or broken components. Make certain table assembly is level.</p> <p>Clean a dirty table top and tighten any loose hardware. Level table assembly.</p> <p>Notify organizational maintenance of any other deficiencies.</p>	<p>Table assembly is damaged. Components, parts, or mounting hardware missing or damaged.</p>

Table 2-5. Operator Preventive Maintenance Checks and Services - (Continued)

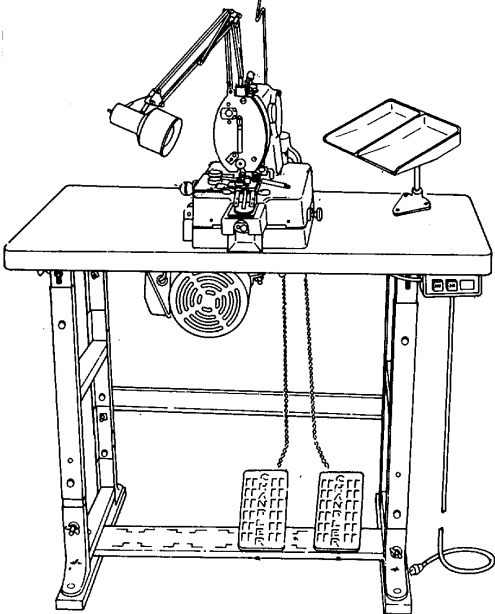
ITEM NO.	INTERVAL			ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF:
	B	D	A		
9	•		•	<p>DARNING SEWING MACHINE (Continued).</p> <ul style="list-style-type: none"> • <i>Machine Service</i> <p>a. Inspect the sewing machine for dirt, lint, and other debris.</p> <p>b. Inspect for proper adjustments and operation (para. 2-12).</p>	b. Sewing machine is out of adjustment or fails to operate.
10	•		•	<p>BUTTON SEWING MACHINE.</p> <ul style="list-style-type: none"> • <i>Table Assembly</i> 	

Table 2-5. Operator Preventive Maintenance Checks and Services - (Continued)

ITEM NO.	INTERVAL			ITEM TO BE INSPECTED PROCEDURE	EQUIPMENT IS NOT READY/ AVAILABLE IF:
	B	D	A		
10				<p>BUTTON SEWING MACHINE (Continued).</p> <p><i>Table Assembly - Continued</i></p> <p>Inspect for cut, cracked, broken, warped, and dirty tabletop. Inspect for loose or missing bolts and nuts and for bent or broken components. Make certain table assembly is level.</p> <p>Clean a dirty table top and tighten any loose hardware. Level table assembly.</p> <p>Notify organizational maintenance of any other deficiencies.</p>	<p>Table assembly is damaged. Components, parts, or mounting hardware missing or damaged.</p>
11	•		•	<p><i>Machine Service</i></p> <p>a. Inspect the sewing machine for dirt, lint, and other debris.</p> <p>b. Inspect for proper adjustments and operation (para. 2-12).</p>	<p>b. Sewing machine is out of adjustment or fails to operate.</p>

SECTION III. OPERATION UNDER USUAL CONDITIONS

	Para.		Para.
Disconnecting Trailer from Towing Vehicle	2-8	Operating Instructions for Tack Button Attaching Machine	2-16
General	2-5	Operation of Auxiliary Equipment	2-11
Operating Instructions	2-10	Preparation for Movement.....	2-17
Operating Instructions for Button Sewing Machine	2-14	Site Selection and Shelter Requirements	2-7
Operating Instructions for Clothing Sewing Machine.....	2-12	Unloading, Assembly, and Installation Instructions.....	2-6
Operating Instructions for Darning Sewing Machine.	2-13	Unloading and Setting Up Equipment	2-9
Operating Instructions for Grommet Machine	2-15		

2-5. GENERAL.

The instructions in this section are for the guidance of operator/crew personnel in the successful operation of the trailer mounted clothing repair shop.

2-6. UNLOADING, ASSEMBLY, AND INSTALLATION INSTRUCTIONS.

The following paragraphs give you general information concerning site selection and shelter requirements for the fielded clothing repair shop. Specific instructions are given to assist you in the unloading, inspection, set up, and service of the clothing repair shop equipment before placing it into operation. Refer to Table 2-6 for an inventory of the items contained in each of the storage boxes.

Table 2-6. Storage Box Inventory List.

STORAGE BOX	ITEM
1	Electric Iron Grommet Press with Dies Tack Button Attaching Press with Dies Darning Sewing Machine Needles Clothing Sewing Machine Needles Button Sewing Machine Needles Darning Sewing Machine Bobbins Clothing Sewing Machine Bobbins Thimbles Clothing Sewing Machine Bobbin Case Belt Hooks
2	Drop Lights Spare Lamp Bulbs for Sewing Table Lights Ground Wire Power Cable

Table 2-6. Storage Box Inventory List - Continued.

STORAGE BOX	ITEM
3	Electric Power Distribution Box Sewing Table Rest Pins Double Thread Unwinder Assemblies Single Thread Unwinder Assembly Thread Unwinder Base Assemblies Bobbin Winders Button Tray Drive Belts Oil Cans Button Machine Treadles Scissors Clothing Punch Pliers Screwdrivers Adjustable Crescent Wrench
4	Power Supply Box Electric Distribution Box Button Sewing Machine Lifter Chains Roll of Leather Belting Ironing Board and Cover

2-7. SITE SELECTION AND SHELTER REQUIREMENTS.

The clothing repair shop is designed to function in the field where it is normally sheltered in a tent. Efficient operation of the equipment and comfort of the operator will depend largely on the site selected and how well the shelter is constructed.

- a. *Site Selection.* When making a selection for a site, keep the following requirements in mind.
- (1) Select a site with a minimum of 42 x 26 ft (13 X 8 m) unobstructed area (the tent dimensions are approximately 32 x 16 ft (10 X 5 m)).
 - (2) Select a dry, dust free, and level plot site that slopes on all sides for water drainage.
 - (3) Clear the site of sharp stones, roots, glass, and any other undesirable matter.
 - (4) Remove overhanging tree branches that could snag the tent.

2-7. SITE SELECTION AND SHELTERS REQUIREMENTS - Continued.

b. *Shelter Requirements.* The Army's general *purpose* tent (medium), complete with pins and poles, will provide adequate shelter for the dismantled equipment of the clothing repair shop. Refer to TM 10-8340-211-13, for instructions concerning handling, pitching, striking and folding of the general purpose tent (medium).

2-8. DISCONNECTING TRAILER FROM TOWING VEHICLE.

Select a dry, flat area as near as possible to the clothing repair shop shelter for parking the trailer. Then proceed as follows to disconnect the cargo trailer from the towing vehicle.

- a. Refer to Figure 2-1. Set both handbrakes (1) by pulling the handbrakes forward to apply the brakes.
- b. Pull up on the handle (2) and lower the caster (3) into position. Release the handle and check that the caster is locked in the down position.
- c. Disconnect the intervehicular electrical cable (4) from the towing vehicle. Place the cable in the bracket.
- d. Close the towing vehicle air shut-off valve. Disconnect the intervehicular air hose (5) from the towing vehicle and put it in the bracket.
- e. Unhook the safety chains (6) from the towing vehicle and hook them to the lifting bars (7).

LEGEND:

- | | |
|---------------------|-----------------|
| 1. Handbrake | 5. Air Hose |
| 2. Handle | 6. Safety Chain |
| 3. Caster | 7. Lifting Bars |
| 4. Electrical Cable | 8. Coupler |

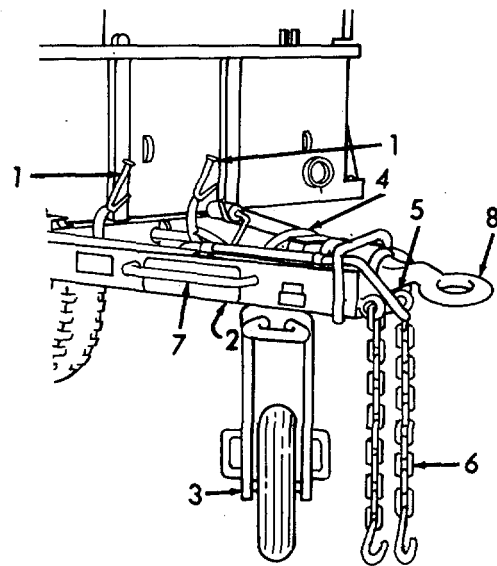


Figure 2-1. Unhooking the Trailer.

- f. Unlatch the pintle and lift the drawbar coupler (8) from the towing vehicle pintle. Move the towing vehicle from the site.

2-8. DISCONNECTING TRAILER FROM TOWING VEHICLE - Continued.

LEGEND:

- 1. Rear Support Leg
- 2. Lever

g. Refer to Figure 2-2. Push up on rear support leg (1) slightly at same time push up on lever (2).

h. Lower leg (1) and screw out base plate to make firm contact with ground.

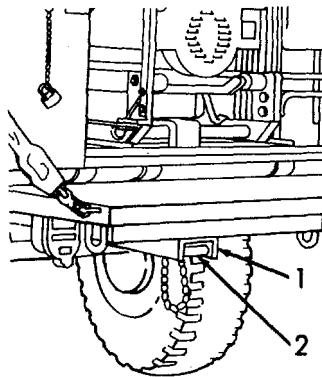


Figure 2-2. Lowering the Rear Support Leg.

2-9. UNLOADING AND SETTING UP EQUIPMENT.

NOTE

As the cabinet assembly is unloaded, check the equipment against the Components of End Item List (COEIL) contained in Appendix C of this manual to insure that the clothing repair shop is complete.

a. *Opening Up the Trailer (Refer to Figures 2-3 and 2-4).*

LEGEND:

- 1. Latch Handle
- 2. Side Door
- 3. Door Stay

(1) Refer to Figure 2-3. Turn both latch handles (1) on each side door (2) to unlock the doors (2).

(2) Raise the doors (2) and make sure the door stays (3) latch to hold the doors (2) in the open position.

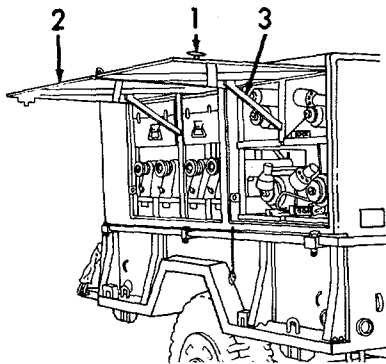


Figure 2-3. Opening the Side Doors.

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.

a. Opening Up the Trailer - Continued.

- (3) Refer to Figure 2-4. Unhook the trailer end gate chains (1).
- (4) Lower the end gate (2).
- (5) Open the rear door (3) and make sure the latches (4) hold the door open.
- (6) Unload the equipment from the cabinet assembly.

LEGEND:

1. Gate Chain
2. End Gate
3. Rear Door
4. Latches

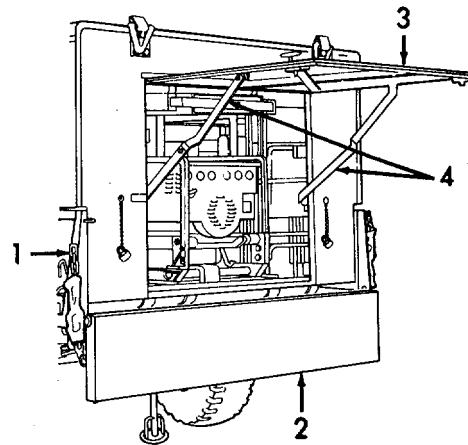


Figure 2-4. Opening the End Gates.

b. Unloading the Generator Set. (Refer to Figure 2-5).

- (1) Remove two wing bolts (1) that secure the generator set holddown bracket (2).
- (2) Remove the holddown bracket (2).

LEGEND:

1. Wing Bolts
2. Holddown Bracket
3. Generator Set

WARNING

The generator set weighs approximately 285 lbs (129.3 kg). To avoid injury to personnel, four persons are required to remove the generator set.

- (3) Carefully slide the generator set (3) rearward and lift it from the slide tracks and out of the cabinet.

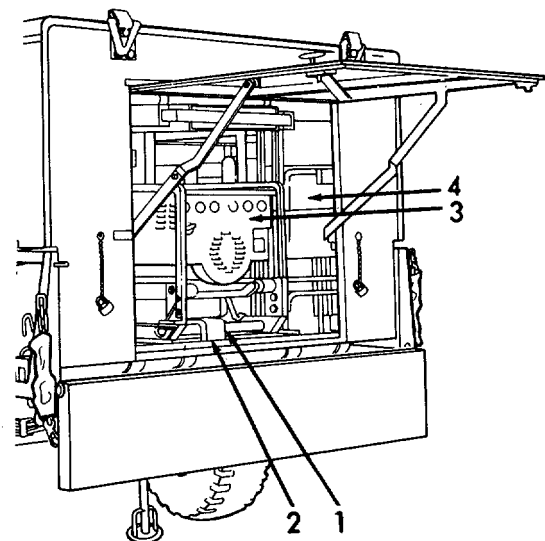


Figure 2-5. Generator Set, Removal.

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.*b. Unloading the Generator Set - Continued.*

- (4) Reinstall the brackets (2) and the wing bolts (1).
- (5) Unstrap and remove the eight folding chairs (4).

WARNING

Do not operate the generator set in an enclosed area unless the exhaust gases are piped to the outside. Inhalation of exhaust fumes will result in serious illness or death.

WARNING

Serious burns will result from touching a hot exhaust pipe.

(6) Place the generator set in a convenient location to furnish the power for the lights and for operating the machines. If it is to be used indoors, install a gas-tight exhaust line to pipe the exhaust gases outdoors. Provide metal shields for the exhaust line if it passes through flammable walls.

c. Folding Table Assemblies. There are two folding table assemblies: one is used as a worktable during the operation of the clothing repair shop and one is used for the installation and operation of the grommet press at one end and the tack-button attaching machine at the other.

- (1) Remove the two table assemblies (5) from the slides in the rear of the cabinet.

NOTE

The table assemblies may be snug and not slide freely. If so, gently pry out from the front.

- (2) Unfold the legs and lock them by sliding the locks downward into position to set up the tables.

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.

d. *Sewing Machine Table Assemblies, Folding Stands, and Storage Boxes (Refer to Figures 2-6 through 2-8).*

LEGEND:

1. Sewing Machine Tables

(1) Refer to Figure 2-6. Unscrew the locking clamps and then slide the eight sewing machine table (top) assemblies (1) from their slide racks and out of the cabinet.

(2) Set table top assemblies on the folding tables.

NOTE

The sewing machine tables must be removed to gain access to the folding stands that are located in the compartments under the table assemblies. The folding stands are used to support the table assemblies, which, in turn, support the sewing machine heads.

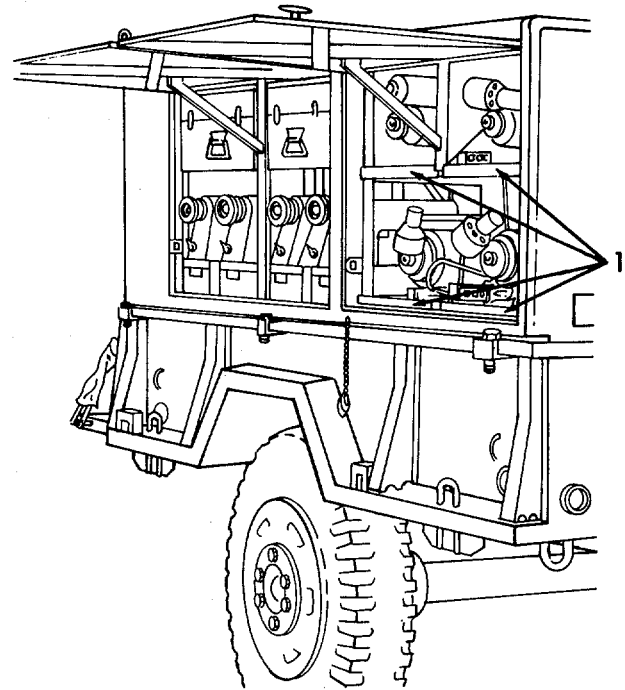


Figure 2-6. Table Top, Removal.

LEGEND:

- 1. Holddown Straps
- 2. Pin
- 3. Cross Brace
- 4. Folding Stands

(3) Refer to Figure 2-7. Unfasten the hold down straps (1).

(4) Remove the pin (2) and then remove the cross brace (3) from the cabinet.

(5) Remove the folding stands (4) from the compartments.

(6) Replace cross brace and pin.

(7) Repeat steps (3) through (6) for other side.

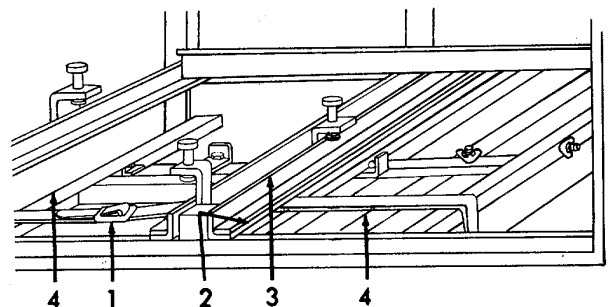


Figure 2-7. Folding Stands, Removal.

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.

d. Sewing Machine Table Assemblies, Folding Stands, and Storage Boxes - Continued.

LEGEND:

1. Storage Box

(8) Refer to Figure 2-8. Slide out the storage boxes (1) out of the cabinet.

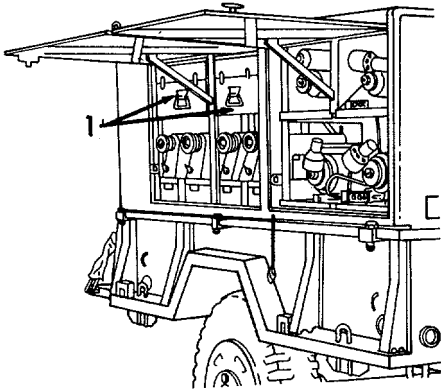
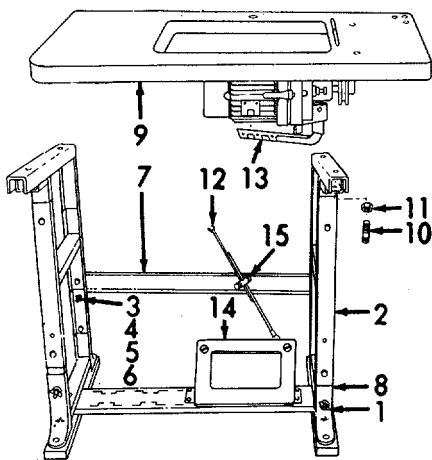


Figure 2-8. Storage Boxes Removal.

e. Assembly of Clothing Sewing Machine Table (Refer to Figures 2-9 and 2-10).

LEGEND:

- | | |
|------------------|-----------------|
| 1. Wingnut | 9. Table Top |
| 2. Folding Stand | 10. Stud |
| 3. Wingnut | 11. Nut |
| 4. Lockwasher | 12. Treadle Rod |
| 5. Flatwasher | 13. Clutch Arm |
| 6. Bolt | 14. Treadle |
| 7. Cross Brace | 15. Lockscrews |
| 8. Foot Section | |



(1) Refer to Figure 2-9. Loosen wingnuts (1) at each corner of folding stand (2).

(2) Remove two wingnuts (3), two lockwashers (4), two flatwashers (5), two bolts (6), and cross brace (7).

(3) Raise the ends of stand (2) to the vertical position.

(4) Press down on the ends of stand until the bottoms come in contact with the top of the foot section (8).

Figure 2-9. Clothing Sewing Machine Table, Assembly.

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.*e. Assembly of Clothing Sewing Machine Table - Continued.*

- (5) Install cross brace (7) on rear of stand and secure with two bolts (6), two flatwashers (5), two lockwashers (4), and two wingnuts (3).
- (6) Tighten wingnuts (1) securely.

NOTE

Table support crosspieces overhang the front of the stand.

CAUTION

To avoid pinching electrical wiring use extreme care when placing the table top on the folding stand.

- (7) Install a sewing table top which is marked C765 (9) on stand (2).
- (8) Start all four studs (10). Tighten studs (10) and then tighten all four nuts (11).
- (9) Install foot treadle rod (12) to clutch arm (13).

NOTE

Clutch engagement speed is variable by the placement of the treadle rod end into the clutch arm. For slower clutch engagement, install the rod end in the outer clutch arm hole.

- (10) Connect other end of foot treadle rod (12) to foot treadle (14).
- (11) If necessary, adjust the treadle (14) to a comfortable height by loosening the lockscrews (15), telescoping the rods (12) out or in, and retightening the lockscrews.
- (12) Pull the tray containing the clothing sewing machine head (labeled C765) out of the cabinet until it hits the stop.
- (13) Remove one wingnut from the holddown strap, loosen the other, and move the strap out of the way.
- (14) Lift the sewing machine head out of the tray.

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.

e. Assembly of Clothing Sewing Machine Table - Continued.

CAUTION

Hinge pins may be a lock fit into the machine head. To prevent loss be sure that both hinge pins remain attached to sewing machine head.

LEGEND:

- | | |
|-------------------|------------------|
| 1. Sewing Machine | 11. Cone Rest |
| 2. Table | 12. Bottom Post |
| 3. Bobbin Winder | 13. Setscrew |
| 4. Screw | 14. Thread Guide |
| 5. Unwinder Base | 15. Top Post |
| 6. Screw | 16. Clip |
| 7. Post | 17. Washer |
| 8. Flat Washer | 18. Wingnut |
| 9. Nut | 19. Nut |
| 10. Pad | 20. Nut |

(15) Refer to Figure 2-10 and install clothing sewing machine (1) to table (2) by meshing the hinge pins with the hinge plates on the table.

(16) Unstrap light assembly from motor and clamp to table top. Be sure the felt on the clamp is on the table top and the thumbscrew is on the bottom.

NOTE

Be sure the hair side of the belt makes contact with the pulleys, and the belt is not twisted. Refer to Appendix F for belt fabrication instructions.

(17) Install the pulley belt to the motor pulley.

(18) Install the other end of the pulley belt to the machine pulley by tilting the head back, installing the belt, and then returning the machine head to the upright position.

(19) Adjust the belt so that it is not stretched but yet not so loose that the machine does not operate. Refer to para. 3-8 for belt adjustment procedure.

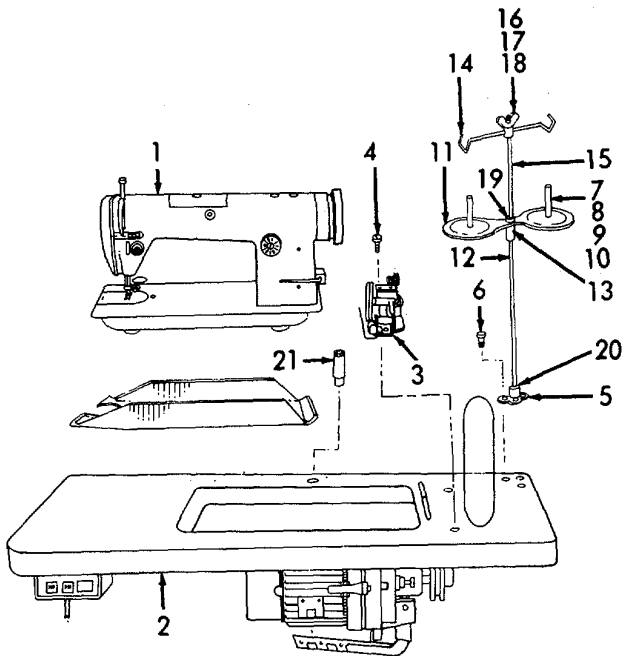


Figure 2-10. Clothing Sewing Machine Table, Installation.

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.*e. Assembly of Clothing Sewing Machine Table - Continued.*

(20) Install bobbin winder (3) to table (2) and secure with two wood screws (4). Adjust for 1/8 inch (3 mm) clearance between bobbin winder pulley and belt.

(21) Install thread unwinder base (5) to table (2) and secure with three wood screws (6).

(22) Install two posts (7), two flat washers (8), two nuts (9), and two pads (10) to cone rest (11).

(23) Install cone rest (11) bottom post (12). Secure the rest (11) by tightening the setscrew (13).

(24) Install thread guides (14) to top post (15) and secure with clip (16), washer (17), and wingnut (18).

(25) Install top post (15) to bottom post (12) and secure by tightening nut (19).

(26) Install bottom post (12) to unwinder base (5). Secure by tightening nut (20).

(27) Install sewing machine rest (21) to table (2).

f. Assembly of Darning Sewing Machine Table (Refer to Figures 2-11 and 2-12).

(1) Assemble the stand in accordance with paragraph 2-9e, steps (1) through (6).

CAUTION

To avoid pinching electrical wiring, use extreme care when placing the table top on the folding stand.

(2) Refer to Figure 2-11. Install a sewing table top which is labeled 678HD (1) on stand (2).

(3) Start all four studs (3). Tighten studs (3) and then tighten all four nuts (4).

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.

f. Assembly of Darning Sewing Machine Table - Continued.

LEGEND:

- | | |
|------------------|-----------------|
| 1. Table Top | 5. Clutch Arm |
| 2. Folding Stand | 6. Treadle Rod |
| 3. Studs | 7. Foot Treadle |
| 4. Nuts | 8. Lockscrews |

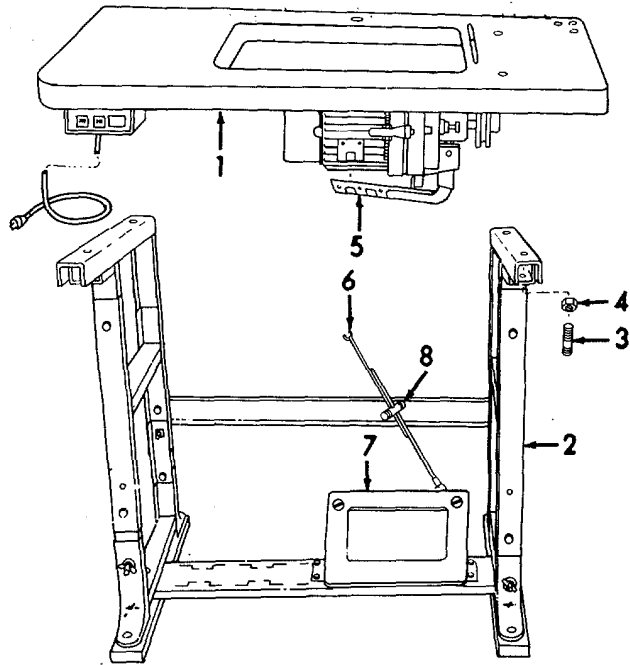


Figure 2-11. Darning Sewing Machine Table, Assembly.

(4) Start all four studs (3). Tighten studs (3) and then tighten all four nuts (4).

(5) Install foot treadle rod (6) to clutch arm (5).

NOTE

Clutch engagement speed is variable by the placement of the treadle rod end into the clutch arm. For slower clutch engagement, install the rod end in the outer clutch arm hole.

(6) Connect other end of foot treadle rod (6) to foot treadle (7).

(7) If necessary, adjust the treadle (7) to a comfortable height by loosening the lockscrews (8), telescoping the rod (6) out or in, and re-tightening the lock screw.

- (8) Pull the tray containing the darning sewing machine head labeled (678HD) out of the cabinet until it hits the stop.
- (9) Loosen wingnut.
- (10) Move the strap out of the way.
- (11) Lift the sewing machine head out of the tray.
- (12) Pull the tray containing the darning sewing machine head labeled (678HD) out of the cabinet until it hits the stop.
- (13) Loosen wingnut and move the strap out of the way.
- (14) Lift the sewing machine head out of the tray.

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.

f. Assembly of Darning Sewing Machine Table - Continued.

- (15) Refer to Figure 2-12. Turn thumbscrew (1) and open base.
- (16) Remove hardware from base.
- (17) Place darning sewing machine (2) into position and secure with three bolts (3), three washers (4), and three nuts (5).
- (18) Unstrap light assembly from motor and secure to table top. Be sure the felt on the clamp is on the table top and the thumbscrew is on the bottom.

LEGEND:

- | | |
|--------------------|------------------|
| 1. Thumbscrew | 13. Nut |
| 2. Darning Machine | 14. Pad |
| 3. Bolt | 15. Cone Rest |
| 4. Washer | 16. Bottom Post |
| 5. Nut | 17. Setscrew |
| 6. Bobbin Winder | 18. Thread Guide |
| 7. Table | 19. Top Post |
| 8. Screw | 20. Clip |
| 9. Unwinder Box | 21. Washer |
| 10. Screw | 22. Wingnut |
| 11. Post | 23. Nut |
| 12. Washer | 24. Nut |
| | 25. Machine Rest |

NOTE

Be sure the hair side of the belt makes contact with the pulleys, and the belt is not twisted. Refer to Appendix F for belt fabrication instructions.

- (19) Install the pulley belt to the motor pulley.
- (20) Install the other end of the pulley belt to the machine pulley by tilting the head back, installing the belt, and then returning the machine head to the upright position.
- (21) Adjust the belt so that it is not stretched, but yet not so loose that the machine does not operate. Refer to para. 3-8 for belt adjustment procedure.

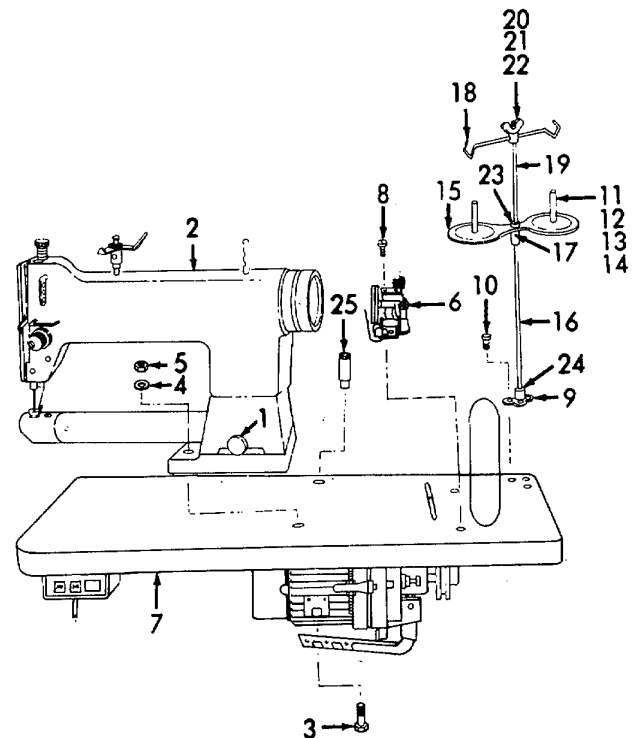


Figure 2-12. Darning Sewing Machine Table, Installation.

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.*f. Assembly of Darning Sewing Machine Table - Continued.*

- (22) Install bobbin winder (6) to table (7) and secure with two wood screws(8). Adjust for 1/8 inch (3 mm) clearance between bobbin winder pulley and belt.
- (23) Install thread unwinder base (9) to table (7) and secure with three wood screws (10).
- (24) Install two posts (11), two flat washers (12), two nuts (13), and two pads (14) to cone rest (15).
- (25) Install cone rest (15) bottom post (16). Secure the rest (15) by tightening the setscrew (17).
- (26) Install thread guides (18) to top post (19) and secure with clip (20), washer (21), and wingnut (22).
- (27) Install top post (19) to bottom post (16) and secure by tightening nut (23).
- (28) Install bottom post (16) to unwinder base (9). Secure by tightening nut (24).
- (29) Install sewing machine rest (25) to table (7).

g. Assembly of Button Sewing Machine Table (Refer to Figures 2-13 and 2-14).

- (1) Assemble the stand in accordance with paragraph 2-9e, steps (1) through (6).

CAUTION

To avoid pinching electrical wiring use extreme care when placing the table top on the folding stand.

- (2) Refer to Figure 2-13. Install a sewing table top which is labeled 600-10 (1) on stand (2).
- (3) Start all four studs (3). Tighten studs (3) and then tighten all four nuts (4).
- (4) Pull the tray containing the button sewing machine head labeled (600-10) out of the cabinet until it hits the stop.

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.

g. Assembly of Button Sewing Machine Table - Continued.

- (5) Loosen wingnut.
- (6) Move the strap out of the way.
- (7) Lift the sewing machine head out of the way.

LEGEND:

- | | |
|------------------|---------|
| 1. Table Top | 3. Stud |
| 2. Folding Stand | 4. Nut |

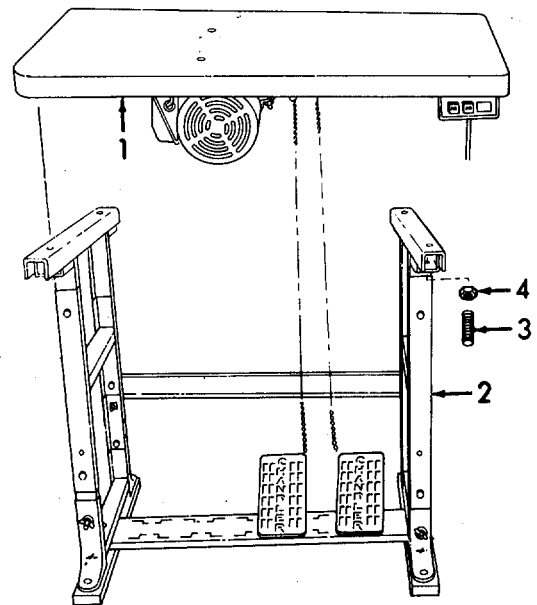


Figure 2-13. Button Sewing Machine Table, Assembly.

- (8) Refer to Figure 2-14. Set the sewing machine (1) on the table (2).
- (9) Loosen lock thumbscrew (3) and carefully tilt machine head (4) over from base.
- (10) Aline mounting holes in base with holes in tabletop.
- (11) Secure base to tabletop with three bolts (5), three washers (6), and three nuts (7) that are to be found in base.

LEGEND:

- | | |
|-------------------|--------------------|
| 1. Sewing Machine | 5. Bolt |
| 2. Table | 6. Washer |
| 3. Thumbscrew | 7. Nut |
| 4. Machine Head | 8. Thread Unwinder |

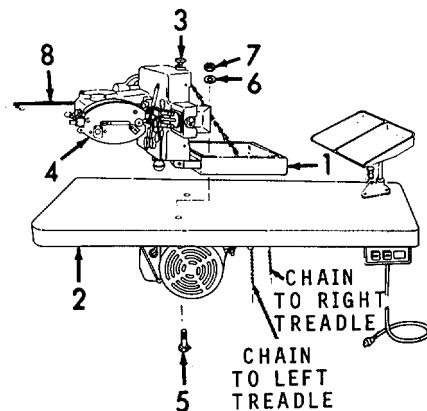


Figure 2-14. Button Sewing Machine Table, Installation.

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.

g. Assembly of Button Sewing Machine Table - Continued.

- (12) Connect chains from the machine to treadles. Adjust chains so that treadles are full up without moving the levers in the machine base.
- (13) Carefully tilt head (4) back into position over base and secure using lock thumbscrew (3).
- (14) Install pulley belt to the motor pulley.
- (15) Install the other end of the pulley belt to the machine pulley.

NOTE

Be sure the hair side of the belt makes contact with the pulleys, and the belt is not twisted. Refer to Appendix F for belt fabrication instructions.

- (16) Adjust the belt so that it is not stretched but yet not so loose that the machine does not operate. Refer to para. 3-8 for belt adjustment procedure.
- (17) Install thread unwinder (8) and install to pins on rear of sewing machine.

h. Grommet Press (Refer to Figure 2-15).

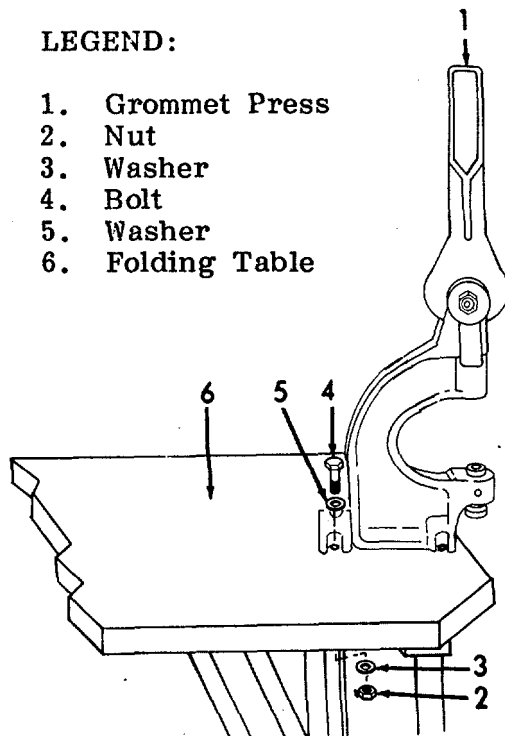


Figure 2-15. Grommet Press, Set-Up.

- (1) Remove the grommet press (1) from the storage box no. 1.
- (2) Remove four nuts (2), four washers (3), four bolts (4), and four washers (5) from the folding table assembly (6).
- (3) Install grommet press (1) over mounting holes.
- (4) Secure with four washers (5), four bolts (4), four washers (3), and four nuts (2).

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.

i. Tack-Button Attaching Machine (Refer to Figure 2-16).

- (1) Remove the tack-button attaching machine (1) from the storage box.
- (2) Remove four nuts (2), four washers (3), four bolts (4), and four washers (5) from the folding table assembly (6).
- (3) Install tack-button attaching machine (1) over mounting holes.
- (4) Secure with four washers (5), four bolts (4), four washers (3), and four nuts (2).

LEGEND:

- | | |
|------------------------|------------------|
| 1. Tack-Button Machine | 4. Bolt |
| 2. Nut | 5. Washer |
| 3. Washer | 6. Folding Table |

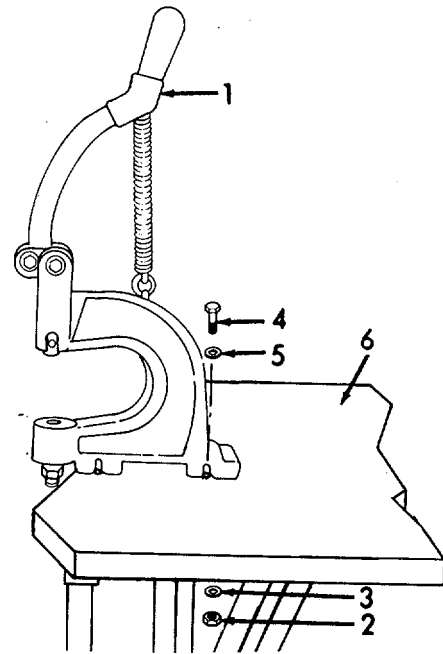


Figure 2-16. Tack-button Attaching Machine, Set-up.

j. Power Cables and Light Cords.

WARNING

Refer to applicable TM on GFE generator set for grounding techniques for that particular set. Failure to ground generator set properly could cause severe injury or death to operating personnel. Be sure the generator set is off before making the below connections.

- (1) Refer to Figure 2-17. Connect white wire from power cable to L1, black wire to L2, and red wire to L3 terminals on generator set. Connect the green wire to the ground leg.

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.

i. Power Cables and Light Cords - Continued.

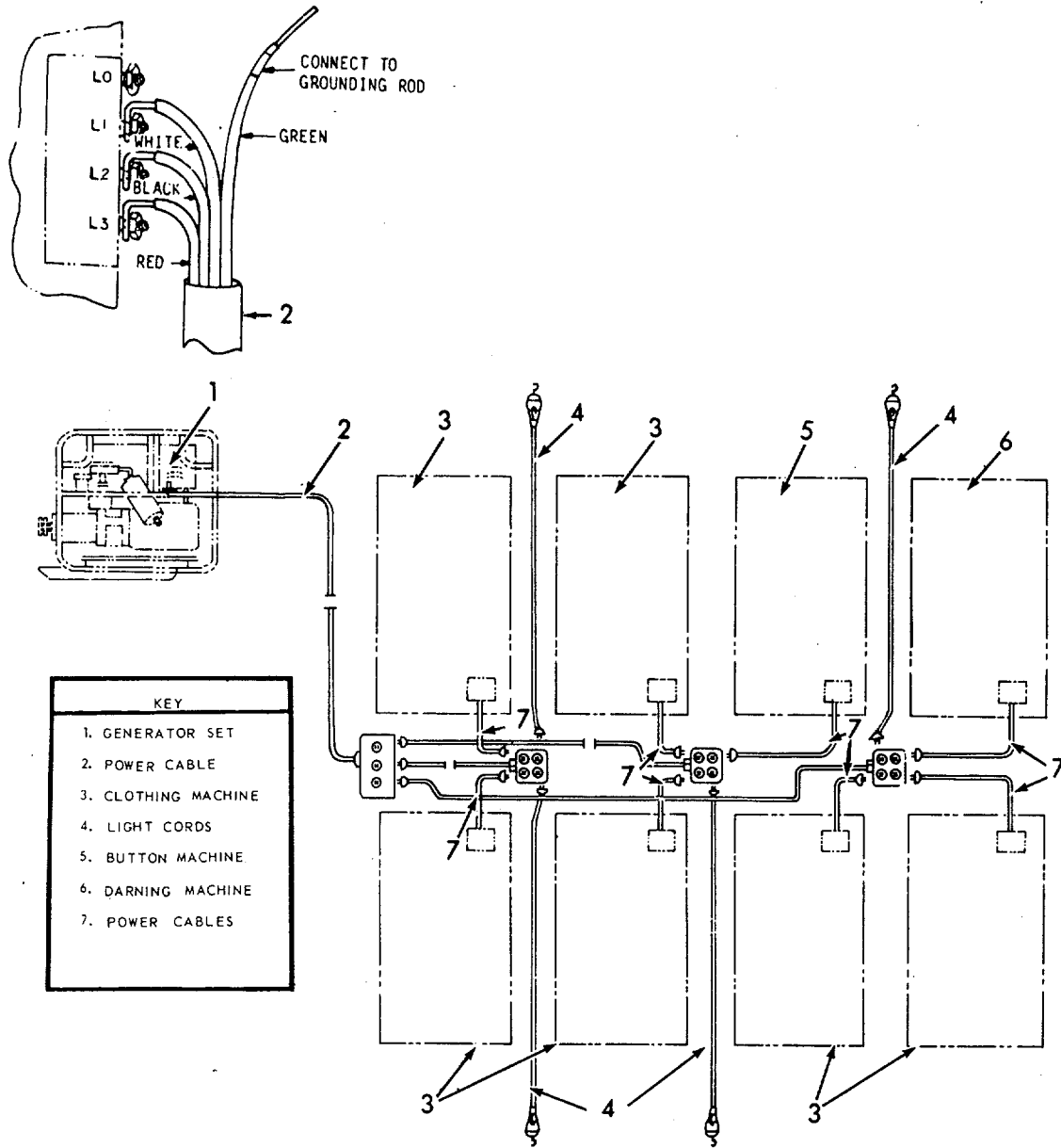


Figure 2-17. Schematic Diagram Showing Sewing Machines Connected to Generator Set.

2-9. UNLOADING AND SETTING UP EQUIPMENT - Continued.*i. Power Cables and Light Cords - Continued.***NOTE**

The receptacles on the three 2-duplex outlet power cables are marked with the letters M and L for proper load distribution. The sewing machines must be plugged in the receptacles marked with the letter M and the light cords must be plugged in the receptacles marked with the letter L.

- (2) Connect the three 2-duplex outlet power cables to the 3-receptacle outlet power cable (connected to the generator set).
- (3) Connect the four light cords to the 2-duplex outlet power cable receptacles marked with the letter L.
- (4) Connect the sewing machine power cords to the 2-duplex outlet power cable receptacles marked with the letter M.

k. Fire Extinguisher. Open the fire extinguisher bracket and remove the fire extinguisher from the cabinet. Place it in a convenient location near the work area.

2-10. OPERATING INSTRUCTIONS.

The following paragraphs are presented to provide guidance and assist you in getting the best performance from the equipment. You, the operator, must know how to perform every operation of which the equipment is capable. Before operating the equipment, read through the operating procedures that apply to the equipment you are to operate. This will give you an overall "feel" for what is to be done.

2-11. OPERATION OF AUXILIARY EQUIPMENT.

Refer to TM 5-6115-271-14 to operate the generator set.

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE.**CAUTION**

Always perform the preventive maintenance checks and services (PMCS, Section II) prescribed in the "B-Before You Operate" column before you use the equipment. Also perform the lubrication instructions contained in Chapter 3, Section I, before operating the equipment. Damage to equipment could result if these maintenance services are not done.

After the clothing sewing machine has been set up, perform the "B-Before You Operate" PMCS, and then perform the lubrication instructions contained in Chapter 3, Section I, before proceeding.

a. Selecting Needle.

- (1) Select the needle of the correct size, class, and variety from the Component of End Item (COEI) of Appendix C, of this manual). The two supplied are 16 x 257, Size 16, and 16 x 257, Size 18.



- (2) Select needle according to the type of thread and the weight of material to be worked. Use left-twist thread only in the needle. Right-twist thread may be used in the bobbin. Refer to Figure 2-18.

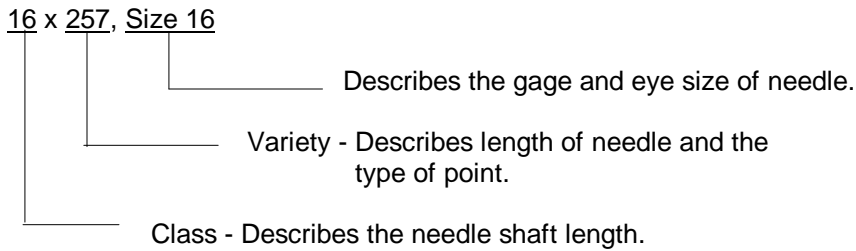
Figure 2-18. Left-twist Thread.

- (3) The thread must pass freely through the needle eye. Rough or uneven thread, or thread that for any reason does not slip easily through the needle eye interferes with the operation of the machine.

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE - Continued.

a. Selecting Needle - Continued.

(4) Needle selection is based on the following:



Based on the above, you would select the size 16 needle for light work and size 18 needle for heavier work.

b. Installing the Needle (Refer to Figures 2-19 through 2-21).

WARNING

Be sure that power is turned off.

(1) Refer to Figure 2-19. Lower the presser foot (1) by pushing down on the presser bar hand lifter (2).

CAUTION

Always rotate the machine pulley wheel towards you. Turning the pulley away from you will break or bend needles or damage bobbin case or rotating sewing hook.

LEGEND:

- 1. Presser Foot
- 2. Hand Lifter

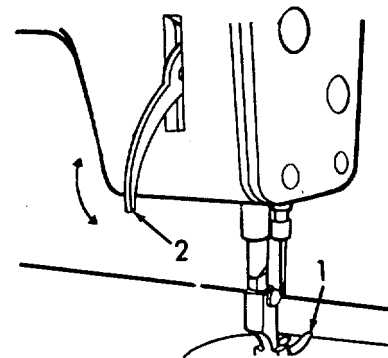


Figure 2-19. Lowering Presser Foot.

- (2) Using your hand, turn the machine pulley toward you to raise the needle bar to its highest position.
- (3) Select a good needle of correct size, class and variety for the work to be done.

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE - Continued.

b. *Installing the Needle - Continued.*

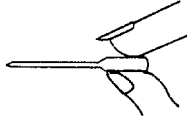


Figure 2-20. Checking Needle Straightness.

- (4) Refer to Figure 2-20. Be sure needle is straight and not bent by rolling the needle between your finger tips and looking for bends.

NOTE

Before installing a used needle, be sure to check it for smoothness by rubbing your fingers lightly around all sides of the point. The needle should feel smooth on all sides.

LEGEND:

- 1. Setscrew
- 2. Needle
- 3. Scarf
- 4. Needle Bar

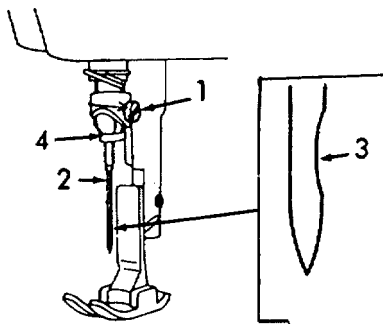


Figure 2-21. Needle, Installation.

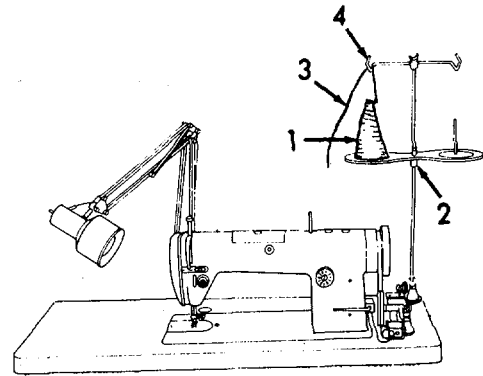
- (5) Refer to Figure 2-21. Loosen needle clamp setscrew (1).
- (6) Hold the needle (2) so that the long groove (3) or scarf and the flat of the needle shank (as applicable) is facing toward the right of the machine.
- (7) Insert the needle shank as far up as it will go into the needle slot in the needle bar (4).
- (8) Tighten the needle clamp setscrew (1).

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE - Continued.*c. Threading the Clothing Sewing Machine (Refer to Figures 2-22 and 2-23).*

- (1) Refer to Figure 2-22. Place thread cone (1) on thread unwinder base (2).
- (2) Feed loose end of thread (3) through unwinder loop (4).
- (3) Refer to Figure 2-23. Using your hand, turn the machine pulley toward you until the take-up lever (8) is to its highest position.

LEGEND:

1. Thread Cone
2. Unwinder Base
3. Thread
4. Loop

**Figure 2-22. Thread Cone, Installation.**

- (4) Pass thread through guide hole (1) and then up, over, and between tension disks (2) of arm needle thread guide pin.
- (5) Feed thread down through first eyelet of thread guide (3) then up, around and down through third eyelet of thread guide.
- (6) Bring thread down and slide between the thread tension disks (4) of the needle tension regulator.
- (7) Bring thread around tension regulator stud and into the takeup spring (5) so that the thread pulls against the spring.
- (8) Bring thread down and under thread guide (6), then up and to the inside of the hook on the take-up thread guide (7).
- (9) Bring thread up and pass it through the hole on the thread take-up lever (8) from right to left.
- (10) Route thread down and through face plate thread guide (9) and then through the needle bar thread guide (10).
- (11) Pass the thread through the thread loop (11) and then carefully pass the thread through the needle eye (12) from left to right. Pull about 4-in. (10 cm) of the thread from the needle eye.

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE - Continued.

c. Threading the Clothing Sewing Machine - Continued.

LEGEND:

1. Guide Hole
2. Tension Disks
3. Thread Guide
4. Tension Disks
5. Take-Up Spring
6. Thread Guide
7. Take-Up Thread Guide
8. Take-Up Lever
9. Face Plate Thread Guide
10. Needle Bar Thread Guide
11. Thread Loop
12. Needle Eye

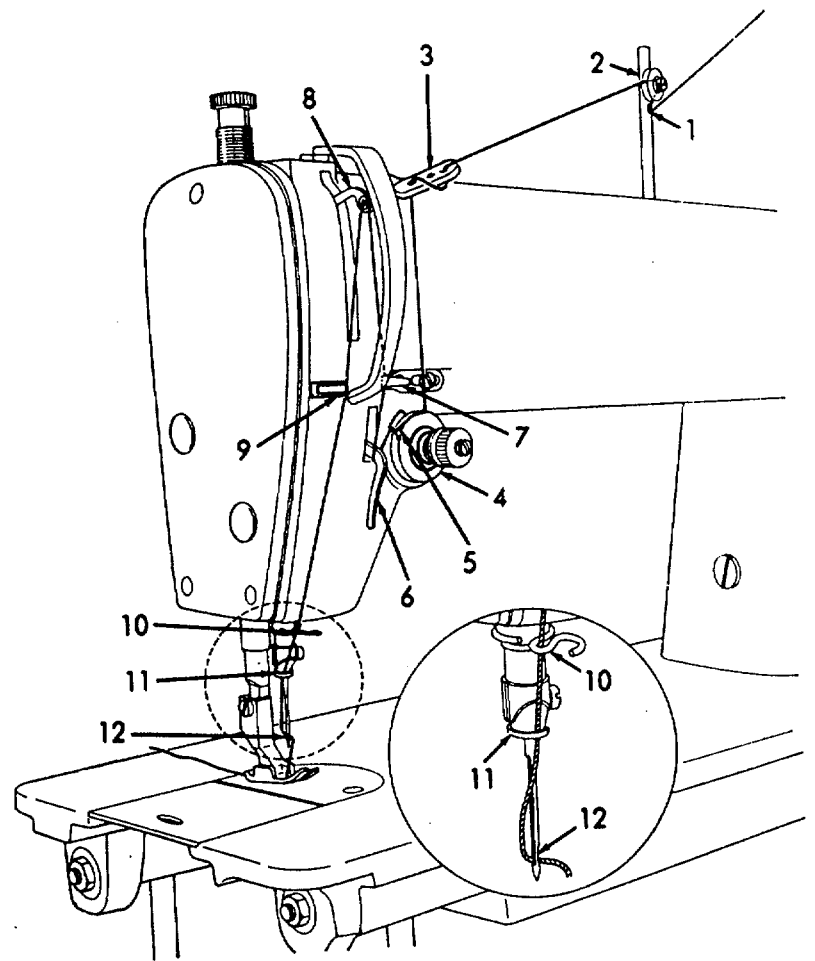


Figure 2-23. Threading the Clothing Sewing Machine.

WARNING

Be sure that electrical power is turned off.

- (1) Using your hand turn the machine pulley toward you until the needle bar travels to its highest position.
- (2) Tilt the machine head back and support it on the rest pin.

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE - Continued.

d. Removing Bobbin Case and Bobbin - Continued.

- (3) Refer to Figure 2-24 Pull the slide plate(1) from the machine bed (2).

LEGEND:

- 1. Slide Plate
- 2. Machine Bed

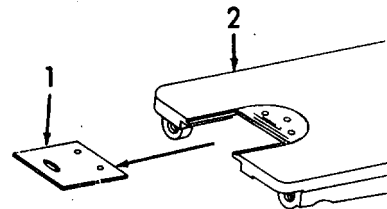


Figure 2-24. Slide Plate, Removal.

- (4) Refer to Figure 2-25. Lift up the bobbin case latch (1) and remove the bobbin case (2) from the rotary-sewing hook (3).

LEGEND:

- 1. Latch
- 2. Bobbin Case
- 3. Rotary Sewing Hook

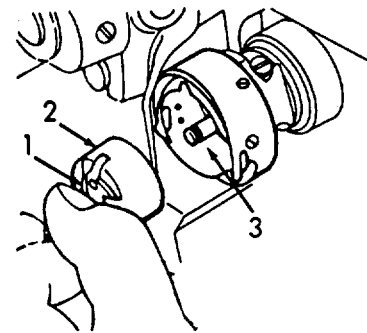


Figure 2-25. Bobbin Case, Removal.

NOTE

If you hold the latch in the open position, the bobbin will not drop out.

- (5) Turn the open end of the bobbin case down, release the latch, and bobbin will drop out.
- (6) Tilt the machine head forward.

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE - Continued.

e. Winding the Bobbin (Refer to Figures 2-26 and 2-27).

- (1) Refer to Figure 2-26. Place an empty bobbin (1) on the bobbin winder spindle (2) and push it on as far as it will go.
- (2) Pass the thread (3) from the unwinder bobbin thread cone down through the hole in the tension bracket (4) and down between the bobbin winder tension disks (5).
- (3) Pull the thread from the lower side of the tension disks (5) to the bobbin (1).
- (4) Pass the thread around the bottom side of the bobbin and wind it around the bobbin a few times.

LEGEND:

1. Bobbin
2. Bobbin Spindle
3. Thread
4. Tension Bracket
5. Tension Disks
6. Thumb Lever
7. Pulley
8. Drive Belt
9. Stop Latch
10. Stop Latch Screw
11. Screw
12. Base

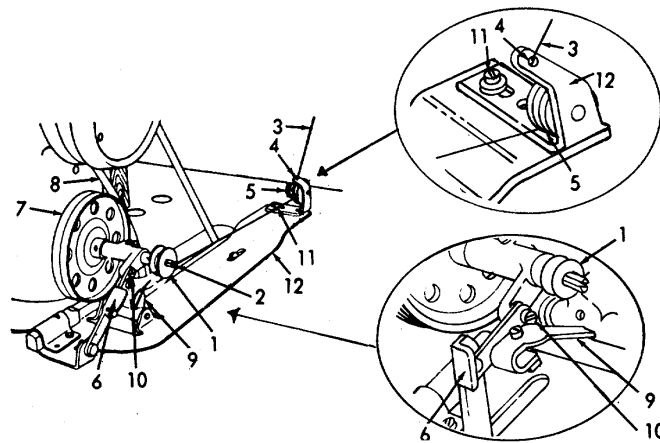


Figure 2-26. Bobbin Winding.

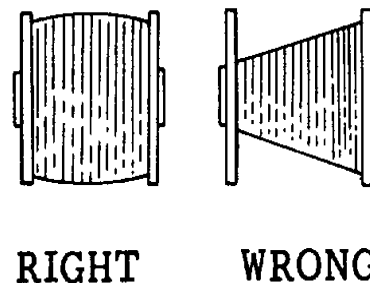
- (5) Push the thumb lever (6) until it latches and holds the winder pulley (7) against the drive belt (8).

NOTE

The bobbin may be wound while the machine is in operation. However, if no material is under the needle, pull the thread from the needle to prevent it from catching the bobbin thread and balling up under the throat plate, and also raise the presser foot to prevent undue wear on the feed dog.

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE - Continued.*e. Winding the Bobbin - Continued.*

- (6) Press the ON button to start the motor and depress the foot treadle to wind the bobbin until the bobbin is fully wound. If properly adjusted by the stop latch adjusting screw (10), the automatic stop latch (9) will operate and throw the bobbin winder pulley (7) away from the machine belt when thread is 1/16 inch (1.6 mm) below the spool lip.
- (7) Regulate the amount of thread wound on the bobbin (1/16 inch (1.6 mm)) below spool lip by adjusting the bobbin winder stop latch screw (10). To wind more thread on the bobbin, turn the screw to the right. To wind less thread on the bobbin, turn the screw to the left.
- (8) If the thread fails to wind evenly on the bobbin (Refer to Figure 2-27) or piles up on one side of the bobbin, loosen the screw (11, fig. 2-26) which holds the tension bracket (4, fig. 2-26) to the base (12, fig. 2-26), and move the tension bracket to the right or the left, as required, then tighten the screws evenly.

**Figure 2-27. Proper Bobbin Winding.**

- (9) When bobbin is properly filled, release foot treadle and push the OFF button.
- (10) Cut thread and remove bobbin from bobbin winder.

*f. Threading the Bobbin Case (Refer to Figure 2-28).***WARNING**

Be sure that electrical power is turned off.

- (1) Open and hold the bobbin latch to prevent the bobbin from dropping out. Then insert the bobbin into the bobbin case so that the thread will be in the right-twist condition.

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE - Continued.

f. Threading the Bobbin Case - Continued.

LEGEND:

- 1. Slot
- 2. Bobbin Case
- 3. Passing Hole

- (2) Slip the thread into the thread passing slot (1) of the bobbin case (2) and then through the thread passing hole (3).
- (3) Pull approximately 4-in. (10 cm) of thread from the bobbin.

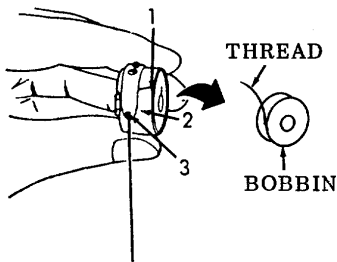


Figure 2-28. Threading the Bobbin Case.

g. Installing the Bobbin Case and Bobbin (Refer to Figures 2-29 and 2-30).

LEGEND:

- 1. Slide Plate
- 2. Machine Bed

- (1) Using your hand, turn the machine pulley toward you until the needle bar travels to its highest point.
- (2) Refer to Figure 2-29. Tilt head back and remove the slide plate (1) from the machine bed (2).

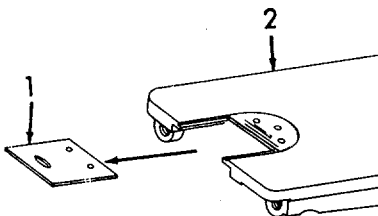


Figure 2-29. Slide Plate, Removal.

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE - Continued.

g. Installing the Bobbin Case and Bobbin - Continued.

- (3) Refer to Figure 2-30. Hold the threaded bobbin case (1) with the latch (2) out so the bobbin will not drop out of the case.
- (4) Place the bobbin case on the center stud (3) of the rotary-sewing hook so that the position finger (5) on the bobbin case is opposite the notch (6) at the top of the rotary- sewing hook (4).

LEGEND:

- 1. Bobbin Case
- 2. Latch
- 3. Stud
- 4. Sewing Hook
- 5. Finger
- 6. Notch

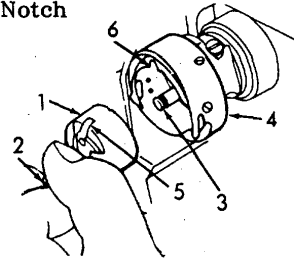


Figure 2-30. Bobbin Case, Installation.

- (5) Release the latch (2), and press the bobbin case (1) into the hook until the latch snaps into the groove near the end of the stud. Be sure the position finger (5) on the bobbin case (1) is in the notch (6) at the top of the hook. About 3-inches (8 cm) of thread should be left hanging down from the bobbin case.

- (6) Refer to Figure 2-29. Install the slide plate (1) and tilt the machine head forward.

h. Catching the Bobbin Thread (Refer to Figure 2-31).

- (1) Raise the presser bar hand lifter (1) to lock the presser foot (2) in its raised position.
- (2) With the left hand, hold the end of the needle thread with a little slack and up towards the arm of the machine

LEGEND:

- 1. Hand Lifter
- 2. Presser Foot
- 3. Needle Thread
- 4. Bobbin Thread

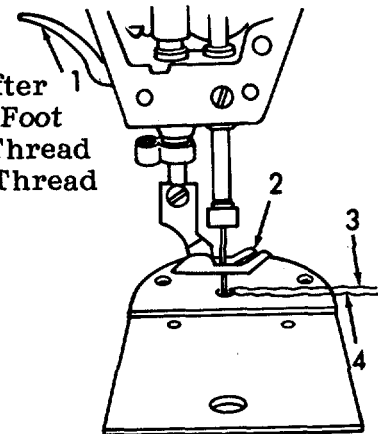


Figure 2-31. Catching the Bobbin Thread.

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE - Continued.*h Catching the Bobbin Thread - Continued.*

- (3) With the right hand turn the machine pulley toward you until the needle moves from its highest position, down, and back up to its highest position. Using the left hand, hold the needle thread with a light tension; the needle thread (3) will catch the bobbin thread (4) as shown.
- (4) Pull the needle thread up, drawing the bobbin thread up through the hole in the throat plate. Lay both threads (about 4-in. or 10 cm of each) back under and behind the presser foot.

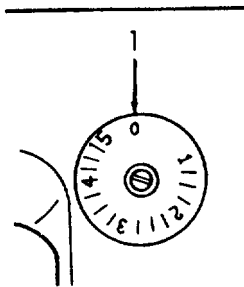
i. Adjusting Stitch Length (Refer to Figure 2-32).

- (1) The feed regulator dial (1) sets the desired stitch length by controlling the distance the feed dog pushes the material forward at each needle up-stroke. The numbers and graduations on the dial are in millimeters (mm).

LEGEND:

1. Regulator Dial

(2) Rotate the feed regulator dial to the right or left and match the desired stitch.

**Figure 2-32. Stitch Length, Adjustment.**

j. Operating the Clothing Sewing Machine. After the machine has been prepared for operation, operate it as follows using excess cloth. Make all thread and presser foot adjustments before starting repairs.

CAUTION

Always rotate the machine pulley wheel towards you. Turning the pulley away from you will break or bend needles or damage bobbin case or rotating sewing hook.

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE - Continued.*j. Operating the Clothing Sewing Machine - Continued.***NOTE**

Before making clothing repairs, make sure of the adjustments by using a piece of scrap cloth.

(1) Inserting Material in Machine.

- (a) Lift the presser bar hand lifter to raise the presser foot which now should have about 3-inches of bobbin and needle threads under and behind it.
- (b) Place the edge of the material under the presser foot and the needle thread; at the same time hand-turn the pulley wheel toward you until the needle is in the material at the desired starting point. Place the end of the needle thread toward the rear of the presser foot, and then lower the presser foot on the needle thread and material.
- (c) Place the end of the needle thread toward the rear of the presser foot, and then lower the presser foot on the needle thread and material.

(2) Turning on Power Source. Set motor switch to the ON position.**(3) Sewing Material.****CAUTION**

During sewing, hold the material flat and do not push or pull it. Pushing or pulling the cloth may bend the needle or cause it to strike the throat plate resulting in a bent or broken needle.

- (a) Hand-turn the pulley wheel toward you and simultaneously hold the needle and bobbin threads until a few stitches are made. Press the foot treadle slowly to engage the clutch with motor. Let the feed dog carry the material evenly under the presser foot and needle.

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE - Continued.

j. Operating the Clothing Sewing Machine - Continued.

(b) When sewing across a seam or an unusually thick or uneven place in the material, release the foot treadle to disengage the clutch and hand-turn the pulley wheel toward you until the rough place is stitched; otherwise, the needle may break. If the material is usually thick, as a comforter for example, decrease the tension on the presser foot by turning the pressure regulating thumbscrew to the left.

(4) Removing Material From Machine.

(a) Release the foot treadle to stop the machine.

(b) Hand-turn the pulley wheel toward you until the needle bar is at its highest point, and raise the presser foot.

(c) Draw the material straight behind the presser foot, and break or cut the needle and bobbin threads so that about 4 inches (10 cm) will remain under and behind the presser foot.

(5) Set motor switch to the OFF position.

k. Adjusting Tension on Bobbin and Needle Threads (Refer to Figures 2-33 through 2-35).

(1) Refer to Figure 2-33. Proper tension locks the bobbin and needle threads in the center of the material as shown by A. If needle thread tension is too tight, or if bobbin tension is loose, the A. needle thread will pull to the upper surface of the material, as shown by B. If bobbin thread tension is too tight, or if needle B. thread is loose, the bobbin thread will pull to the underside of the material as shown by C. If both threads are too tight, the material C. will be puckered and drawn together by the stitches and the threads will break. Adjust the tensions as follows:

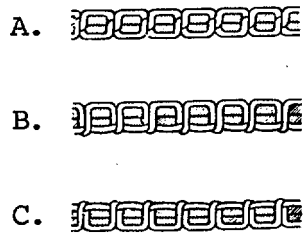


Figure 2-33. Checking Thread Tension.

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE - Continued.

k. Adjusting Tension on Bobbin and Needle Threads - Continued.

- (2) Bobbin Thread Tension. Refer to Figure 2-34. Remove the bobbin case (para.2-12d). Adjust the bobbin thread tension with the adjusting screw. Turn the screw to the right to increase tension, and to the left to decrease tension.

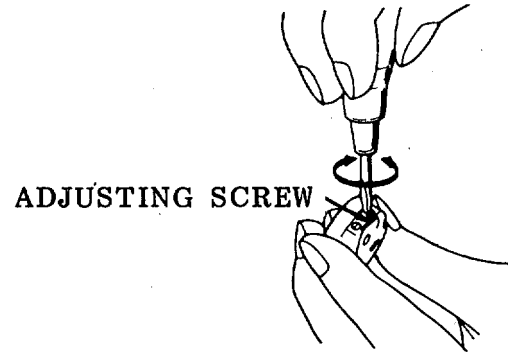


Figure 2-34. Bobbin Thread Tension, Adjustment.

- (3) Needle Thread Tension. Refer to Figure 2-35. Lower the presser foot onto the feed dog to close the tension disks. Adjust the needle thread tension with the tension adjust nut. Turn the tension nut right to increase tension and left to decrease tension.

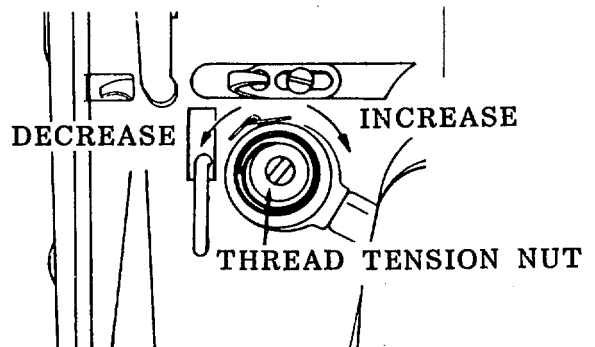


Figure 2-35. Needle Thread Tension, Adjustment.

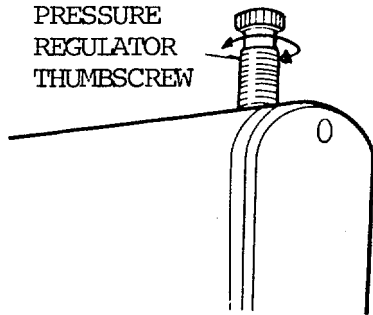
l. Adjusting Pressure on Foot Presser (Refer to Figure 2-36).

NOTE

Tension should be adjusted or regulated only when the presser foot is down.

2-12. OPERATING INSTRUCTIONS FOR CLOTHING SEWING MACHINE - Continued.*I. Adjusting Pressure on Foot Presser - Continued.*

(1) For the needle to make an even stitch, the material must move forward at a uniform speed. The correct presser foot pressure on the material enables the feed dog to push the material forward each time the needle goes up. If the pressure is too light, the dog will not feed the material, the needle will hit in one place on the material, and the bobbin thread will knot or ball up. If the pressure is too great, the feed dog will wear unnecessarily and feed the bottom material (fabric or cloth) faster than the upper material.



(2) Turn the pressure regulator thumbscrew on top of the machine to the right to increase the pressure or to the left to decrease the pressure.

Figure 2-36. Foot Presser, Adjustment

2-13. OPERATING INSTRUCTIONS FOR DARNING SEWING MACHINE.

CAUTION

Always perform the preventive maintenance checks and services (PMCS, Section II) prescribed in the "B-Before You Operate" column before you use the equipment. Also perform the lubrication instructions contained in Chapter 3, Section I, before operating the equipment. Damage to equipment could result if these maintenance services are not done.

After the darning sewing machine has been set up, perform the "B-Before You Operate" PMCS, and then perform the lubrication instructions contained in Chapter 3, Section I, before proceeding.

2-13. OPERATING INSTRUCTIONS FOR DARNING SEWING MACHINE - Continued.

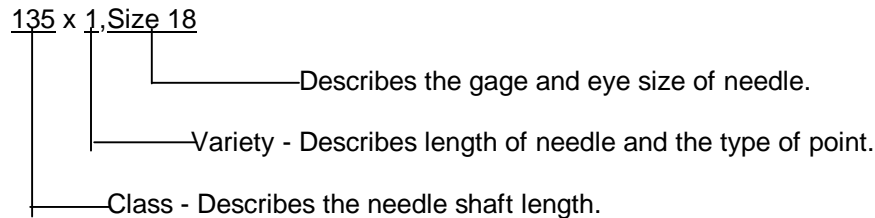
a. Selecting Needle (Refer to Figure 2-37).

- (1) Select the needle of the correct size, class, and variety from the Components of End Item (COEI) of Appendix C, of this manual. The two supplied are: 135 x 1, Size 18 and 135 x 1, Size 20.
- (2) Needle selection should be according to the type of thread and the weight of the material to be worked. Left-twist thread must be used in the needle, but right-twist thread may be used in the bobbin.



Figure 2-37. Left Twist Thread.

- (3) The thread must pass freely through the needle eye. Rough or uneven thread, or thread that does not slip easily through the needle eye interferes with the operation of the machine.
- (4) Needle selection is based on the following:



Based on the above, you would select the size 18 needle for light work and size 20 for heavier work.

b. Installing the Needle. Install the needle in accordance with paragraph 2-12b.

2-13. OPERATING INSTRUCTIONS FOR DARNING SEWING MACHINE - Continued.

c. *Threading the Darning Sewing Machine (Refer to Figures 2-38 and 2-39).*

LEGEND:

- | | |
|------------------|-----------|
| 1. Thread Cone | 3. Thread |
| 2. Unwinder Base | 4. Loop |

(1) Refer to Figure 2-38. Place thread cone (1) on thread unwinder base (2).

(2) Feed loose end of thread (3) through unwinder loop (4) and then through post (5).

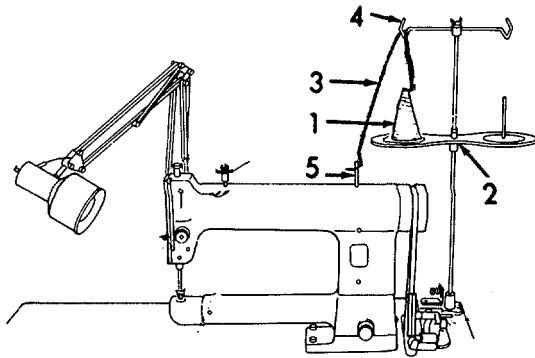


Figure 2-38. Thread Cone, Installation.

LEGEND:

- | | |
|------------------------|----------------------|
| 1. Thread Stand Off | 5. Tension Washer |
| 2. Tension Disk Spring | 6. Take-Up Lever (3) |
| 3. Thread Guide Guide | 7. Spring Washer |
| 4. Lower Thread Guide | 8. Upper Thread |
| | 9. Thread Guide |
| | 10. Needle |

(3) Refer to Figure 2-39. Using your hand, turn the machine pulley toward you until the take-up lever (6) is to its highest position.

(4) Pass the thread down and up through the hole in thread stand off (1) and to the left rear and between tension disk springs (2).

(5) Pass thread through upper thread guide (3) and down behind lower thread guide (4) as shown.

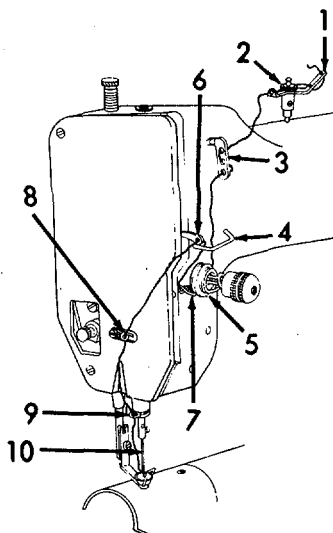


Figure 2-39. Threading the Sewing Machine.

2-13. OPERATING INSTRUCTIONS FOR DARNING SEWING MACHINE - Continued.

c. Threading the Darning Sewing Machine - Continued.

- (6) Next, lead the thread to the right and between the two tension washers (5) of the needle tension adjust and catch the spring (7).
- (7) Draw the thread to the left and behind the lower thread guide (4), and then through the hole in the take-up lever (6).
- (8) Lead the thread down the face of the machine and through thread guides (8) and (9).
- (9) Finally, draw the thread through the needle eye (10) from left to right. Pull and leave out about 4 in. (10 cm) of the thread from the needle eye.

d. Removing Bobbin and Case (Refer to Figure 2-40).

WARNING

Be sure that the electrical power is turned off.

LEGEND:

- | | |
|---|--|
| <ul style="list-style-type: none"> (1) Using your hand, turn the machine pulley toward you until the needle bar travels to its highest position (2) Lift the latch (1) of the bobbin case (2) and remove from rotary-sewing hook (3). | <ul style="list-style-type: none"> 1 Latch 2 Bobbin Case 3 Rotary Sewing Hook |
|---|--|

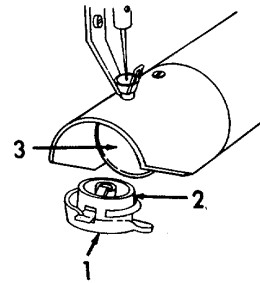


Figure 2-40. Bobbin Case, Removal.

NOTE

If you hold the latch in the open position, the bobbin will not drop out.

- (3) Turn the open end of the bobbin case down, release the latch, and the bobbin will drop out.

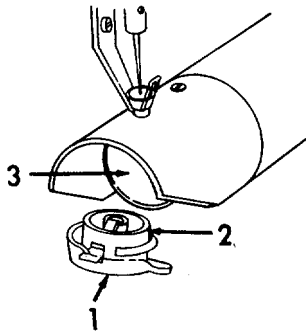
2-13. OPERATING INSTRUCTIONS FOR DARNING SEWING MACHINE - Continued.

- e. *Winding the Bobbin.* Wind the bobbin in accordance with paragraph 2-12e.
- f. *Threading the Bobbin Case.* Thread the bobbin case in accordance with paragraph 2-12f.
- g. *Installing the Bobbin Case and Bobbin (Refer to Figure 2-41).*

(1) Using your hand, turn the machine pulley toward you until the needle bar travels to its highest point.

LEGEND

- 1. Latch
- 2. Bobbin Case
- 3. Stud
- 4. Finger



- (2) Hold the threaded bobbin case (2) with the latch (1) out so the bobbin will not drop out of the case.
- (3) Place the bobbin case (2) on the center stud (3) of the rotary- sewing hook so that the position finger (4) on the bobbin case is opposite the notch at the top of the rotary-sewing hook.
- (4) Release the latch, and press the bobbin case into the rotary- sewing hook until the latch snaps into the groove near the end of the stud. The position finger on the bobbin case should be in the notch at the top of the hook. About 3-inches (8 cm) of thread should be left hanging from the bobbin case.

Figure 2-41. Bobbin Case, Installation.

h. Catching the Bobbin Thread. After the needle has been threaded and the bobbin case has been placed in the machine, use the needle thread to catch and to draw the bobbin thread up through the hole in the latch sleeve, as follows:

- (1) Raise the presser bar hand lifter to lock the presser foot in its raised position.
- (2) With the left hand, hold the end of the needle thread with a little slack and towards the upright of the arm of the machine.

2-13. OPERATING INSTRUCTIONS FOR DARNING SEWING MACHINE - Continued.*h. Catching the Bobbin Thread - Continued.*

- (3) With the right hand turn the machine pulley toward you until the needle moves from its highest position, down, and back up to its highest position. If the needle thread is held with a light tension during this operation, and if the needle is correctly timed, the needle thread will catch the bobbin thread.
- (4) Pull the needle thread up, drawing the bobbin thread up through the hole in the latch sleeve. Lay both threads (about 4-in. or 10 cm) back under and behind the presser foot.

- i. Operating the Darning Sewing Machine. After the machine has been prepared for operation, operate it as follows using excess cloth. Make all thread and presser foot adjustments before starting repairs.

CAUTION

Always rotate the machine pulley wheel towards you. Turning the pulley away from you will break or bend needles or damage bobbin case or rotating sewing hook.

NOTE

Before making repairs, make sure of the adjustments by using a piece of scrap cloth.

(1) Inserting Material in Machine.

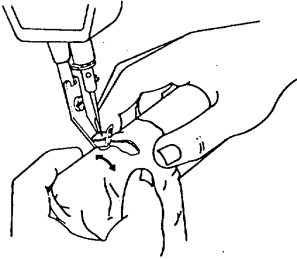
- (a) Lift the presser bar hand lifter to raise the presser foot.
Be sure about 3-inches (10 cm) of bobbin and needle threads are under and behind it.
- (b) Place the material or garment on the latch sleeve of the machine and flatten out the part of the item to be darned.
- (c) Lower the presser foot on the material.

(2) Turning on Power Source. Set motor switch to the ON position.

(3) Darning Material.

NOTE

To obtain proper stitching and prevent thread balling, the material must be kept moving during the darning operation. If necessary, adjust the treadle for slower operation.

2-13. OPERATING INSTRUCTIONS FOR DARNING SEWING MACHINE - Continued.*i. Operating the Darning Sewing Machine - Continued.***Figure 2-42. Darning Material.**

- (a) Hand-turn the machine pulley toward you and simultaneously hold the needle and bobbin threads in your left hand until a few stitches are made. Press the foot treadle to engage the clutch to start the machine. Hold the material to be darned with both hands, one hand on one side and one hand on the other side of the material close to the presser foot as shown by Figure 2-42

- (b) Start darning by making a line of stitches a little to the side of the hole and a little longer than the width of the hole. Make parallel lines of stitches across the hole by moving the garment backward and forward while gradually moving the garment sideways until the hole is covered with lines of parallel stitches. Then turn the garment and stitch across the parallel lines of stitches until the hole is completely covered with cross-stitches.

(4) Removing Material From Machine.

- (a) Release the foot treadle to stop the machine.
- (b) Hand-turn the pulley wheel toward you until the stitch is completed and the needle bar is at its highest point; and raise the presser foot.
- (c) Draw the material straight behind the presser foot, and break or cut the needle and bobbin threads so that about 4 inches (10 cm) remain under and behind the presser foot.

(5) Set motor switch to the OFF position.

j. Adjusting Stitch Length. Adjustment of the stitch length is determined by how fast the material is fed to the machine.

2-13. OPERATING INSTRUCTIONS FOR DARNING SEWING MACHINE - Continued.

k. *Adjusting Tension on Bobbin and Needle Thread (Refer to Figures 2-43 through 2-45).*

(1) Refer to Figure 2-43. Uniform stitching or mending depends on operator skill and proper adjustment. If stitching is properly done and tensions are properly adjusted, the threads should meet and lock in the center of the material as shown by A.

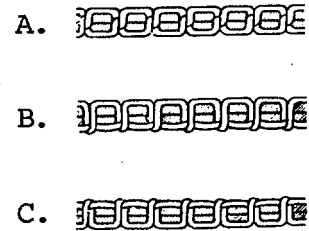


Figure 2-43. Checking Thread Tensions.

If the needle thread tension is too tight, or the bobbin thread tension is too loose, the bottom thread will pull to the top of the material as shown by B. When the needle thread tension is too loose or the bobbin thread tension is too tight, the bobbin thread will lie along the under side of the material as shown by C, or form loops. When these loops form, the darning will bunch up. To regulate the bobbin and needle thread tensions proceed as follows:

(2) Bobbin thread tension (Refer to Figure 2-44).

Remove the bobbin (paragraph 2-13d). Adjust the bobbin thread tension with the adjusting screw. Turn the screw to the right to increase tension or to the left to decrease the tension.

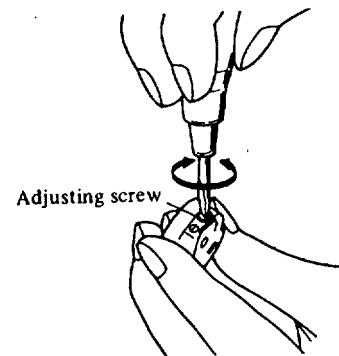


Figure 2-44. Bobbin Thread Tension, Adjustment.

2-13. OPERATING INSTRUCTIONS FOR DARNING SEWING MACHINE - Continued.

k. Adjusting Tension on Bobbin and Needle Thread - Continued.

(3) Tension on needle thread (Refer to Figure 2-45).

Adjust the needle thread tension with the tension adjust nut. Lower the presser foot to close the tension disks and turn the tension adjust nut to the right to increase the tension and to the left to decrease the tension.

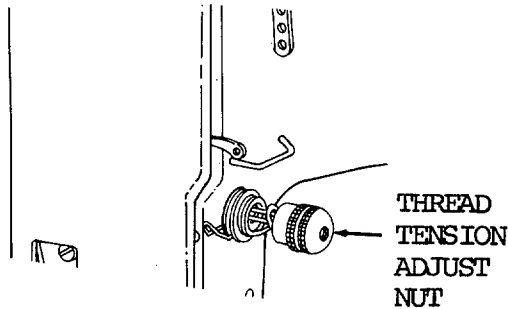
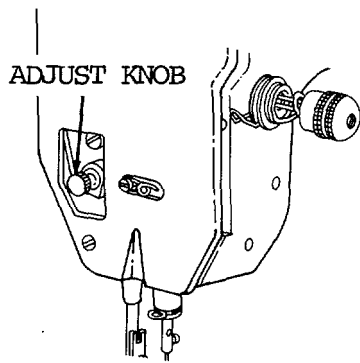


Figure 2-45. Needle Thread Tension, Adjustment.

l. Adjusting Foot Pressure (Refer to Figures 2-46 and 2-47).



(1) Height Adjustment. The presser foot height adjustment knob allows (Figure 2-46) work on the heaviest as well as the lightest materials. The machine is normally adjusted for light to medium work. When heavy work such as nets, coats, blankets, overalls, and aprons are encountered, an adjustment is required. Raise the presser foot, pull the adjustment knob out and turn it a half turn to the right (c w), and push the knob back in.

Figure 2-46. Presser Foot, Adjustment

NOTE

On returning to light work, the presser foot adjustment knob must be returned to its original position.

2-13. OPERATING INSTRUCTIONS FOR DARNING SEWING MACHINE - Continued.*I. Adjusting Foot Pressure - Continued.*

- (2) Pressure adjustment. Figure 2-47 is used to set presser foot pressure, regardless of the setting of the adjust knob. It acts as a fine tuning device. If the pressure is too great and the material hangs up, turn the thumbscrew to the left (ccw). If the pressure is too light, turn the thumbscrew to the right (cw).

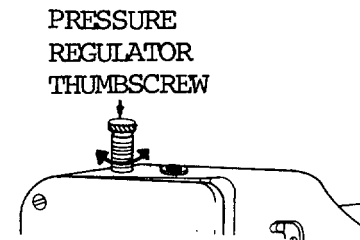


Figure 2-47. Pressure Regulator Thumbscrew.

2-14. OPERATING INSTRUCTIONS FOR BUTTON SEWING MACHINE.

CAUTION

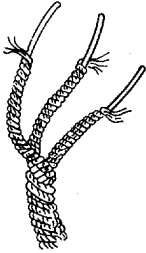
Always perform the preventive maintenance checks and services (PMCS, Section II) prescribed in the "B-Before You Operate" column before you use the equipment. Also perform the lubrication instructions contained in Chapter 3, Section I, before operating the equipment. Damage to equipment could result if these maintenance services are not done.

After the button sewing machine has been set up, perform the "B-Before You Operate" PMCS, and then perform the lubrication instructions contained in Chapter 3, Section I, before proceeding.

2-14. OPERATING INSTRUCTIONS FOR BUTTON SEWING MACHINE - Continued.

a. *Selecting Needle (Refer to Figure 2-48).*

(1) Select the needle of the correct size, class, and variety from the Components of End Item (COEI) of Appendix C of this manual. The two supplied are 175 x 3, Size 16 and 175 x 3, Size 18.

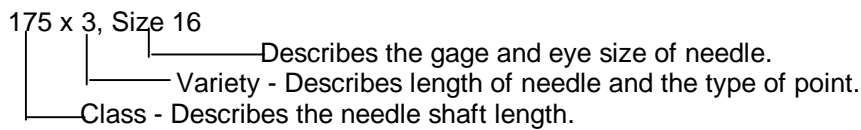


(2) Needle selection should be according to the type of left-twist thread and the weight of the material to be worked. Left-twist thread must always be used in the button sewing machine.

Figure 2-48. Left Twist Thread

(3) Thread must pass freely through the needle eye. Rough or uneven thread, or thread that for any reason does not slip easily through the needle eye interferes with the operation of the machine.

(4) Needle selection is based on the following:



Based on the above, you would select the size 16 needle for light work and size 18 for heavier work.

2-14. OPERATING INSTRUCTIONS FOR BUTTON SEWING MACHINE - Continued.

b. *Installing the Needle (Refer to Figures 2-49 and 2-50).*

WARNING

Be sure that electrical power is turned off.

- (1) Select a good needle of correct size, class, and variety for the work to be done.
- (2) Refer to Figure 2-49. Be sure needle is straight and not bent by rolling the needle between your finger tips and looking for bends.

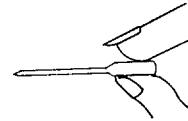


Figure 2-49. Checking Needle Straightness.

NOTE

Before installing a used needle, be sure to check it for smoothness by rubbing your fingers lightly around all sides of the point. The needle should feel smooth on all sides.

- (3) Refer to Figure 2-50. Loosen the needle clamp setscrew(1).
- (4) Hold the needle (2) so that the long groove on scarf (3) is in the front of the machine.
- (5) Install the needle (2) into the needle bar (4) as far as it will go.
- (6) Tighten the setscrew (1)

LEGEND

- 1. Setscrew
- 2. Needle
- 3. Scarf
- 4. Needle Bar

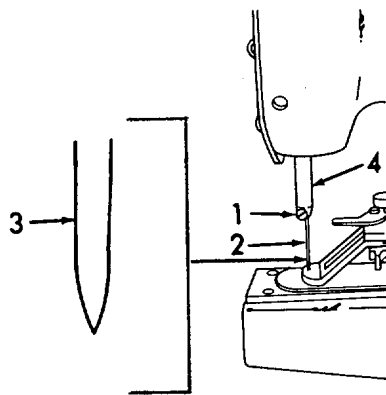


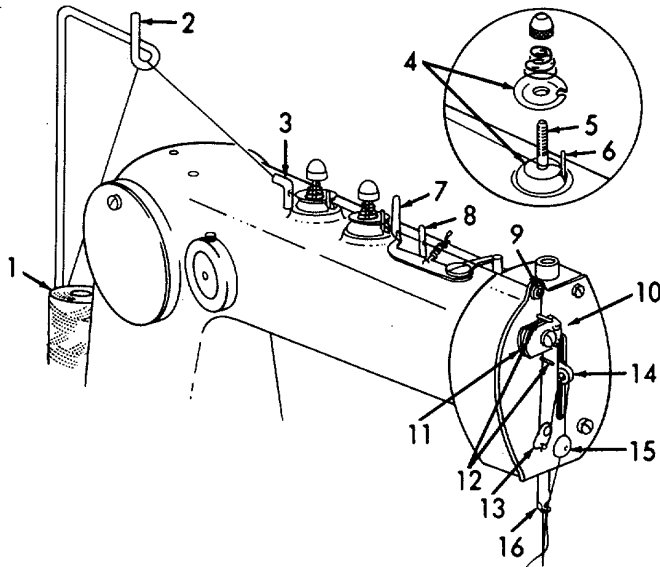
Figure 2-50. Needle, Installation.

2-14. OPERATING INSTRUCTIONS FOR BUTTON SEWING MACHINE - Continued.

c. Threading the Button Sewing Machine (Refer to Figure 2-51).

(1) From spool (1), pass thread through unwinder loop (2).

(2) Feed thread through rear guide (3).



LEGEND:

- 1. Spool
- 2. Unwinder
- 3. Rear Guide
- 4. Tension Disks
- 5. Tension Post
- 6. Pin
- 7. Pull-Off Lever
- 8. Front Guide Pin
- 9. Guide Hole
- 10. Face Plate
- 11. Slot
- 12. Lower Pin
- 13. Guide Plate
- 14. Take-Up Lever
- 15. Tension Disk
- 16. Thread Guide

Figure 2-51. Button Sewing Machine Threading.

NOTE

Thread both thread tensioners in accordance with step (3) below.

(3) Slide thread between rear tension disks (4) on the left hand side of tension post (5), and then to the right hand side of pin (6) as shown in detailed view.

(4) Pass thread forward through hole in thread slack pull-off lever (7).

(5) Pass thread through hole in front guide pin (8) and then through the thread guide hole (9) in top of the face plate (10).

(6) Keep thread to the right of lower pin (12). Slide thread into slot (11) and down to the right side of lower pin (12).

(7) Pass the thread down to the left and around roller in lower guide plate (13).

(8) Insert thread through hole in needle bar take-up lever (14) from left to right.

2-14 OPERATING INSTRUCTIONS FOR BUTTON SEWING MACHINE - Continued.*c. Threading the Button Sewing Machine - Continued.*

(9) Pass thread to the right and under tension disk (15) of face plate.

(10) Pass thread through thread guide (16) and then through needle eye from front to back.

d. Adjusting Thread Tension (Refer to Figure 2-52).

(1) The rear tension adjust knob is factory set. Do not disturb or attempt to use rear tension adjust knob for adjustment of normal thread tension. If proper thread tension cannot be obtained by use of front thread tension adjust knob, notify your supervisor.

(2) Tightness of the stitch is regulated by the front tension adjust knob. If the tension adjustment is too tight, the looper will snap the thread; if it is too loose, the knots on the under side of the button will be loose. Turning the knob to the right (cw) increases thread tension, turning it to the left (ccw) decreases tension.

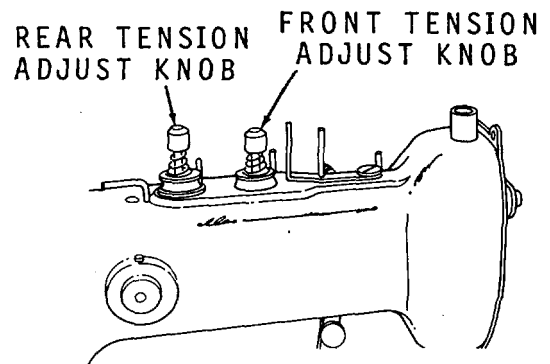


Figure 2-52. Thread Tension, Adjustment.

2-14. OPERATING INSTRUCTIONS FOR BUTTON SEWING MACHINE - Continued.

e. *Adjusting Opening in Button Clamp (Refer to Figure 2-53).*

LEGEND:

- 1. Lever
- 2. Button
- 3. Button
- 4. Thumbscrew
- 5. Lever

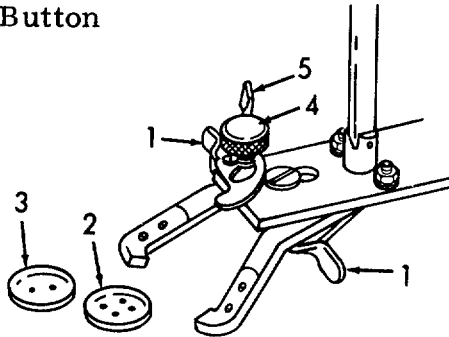


Figure 2-53. Button Clamp Opening, Adjustment.

- (1) Press and hold the left foot treadle to raise the button clamp.
- (2) Use the button clamp spreader lever (1) to open the button clamp and insert a button (2 or 3) with the holes aligned right and left and then release the lever (1).
- (3) Loosen thumbscrew (4) and move the adjusting lever (5) to a point where it just contacts the screw threads. Tighten thumbscrew (4) securely.

f. *Adjusting for Two-Hole and Four-Hole Buttons (Refer to Figure 2-54).*

NOTE

The scale, for both two-hole, four-hole regulator (1) and the lateral hole regulator (3) are calibrated in inches with the numbers representing 1/16 increments (1/32 inch divisions).

LEGEND:

- 1. Two-Hole, Four-Hole Regulator
- 2. Pointer
- 3. Lateral Hole Distance Regulator
- 4. Adjustment Knob

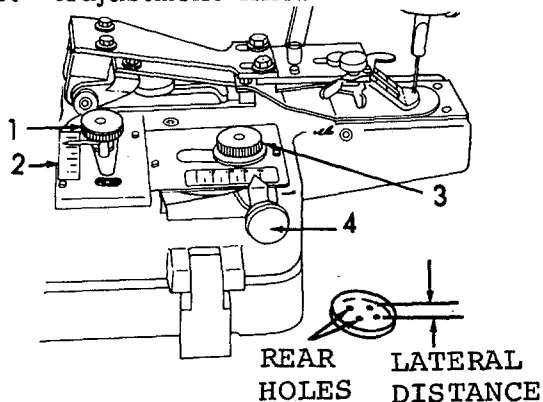


Figure 2-54. Two-Hole/Four-Hole Button Selection.

- (1) Two-Hole, Four-Hole Regulator.

- (a) For attaching a two-hole button, loosen the knob (1) adjust the point (2) to "0" on the scale.
- (b) For attaching a four-hole button, measure the distance between centers of the front and rear holes. Loosen knob (1) and adjust pointer (2) to the distance between the scale.

NOTE

The following step applies to either a two-hole or four-hole button.

2-14. OPERATING INSTRUCTIONS FOR BUTTON SEWING MACHINE - Continued.

f. *Adjusting for Two-Hole and Four-Hole Buttons - Continued.*

(2) Lateral Distance. Measure the distance between the button hole centers. Loosen the knob (3) and adjust the regulator (4) for this distance on the scale.

NOTE

Be sure the button type and hole distances have been correctly adjusted (step f) before proceeding.

g. *Operating the Button Sewing Machine.*

(1) Inserting Button and Material in Machine.

(a) Depress the left foot treadle to raise the button clamp enough to insert the button in the jaws of the clamp. While the clamp is raised, insert the material between the clamp and the feed plate.

(b) Release the treadle.

(2) Turning on Power Source. Set motor switch to the ON position.

(3) Sewing Button on Material.

(a) Using a quick firm tread push down on the right treadle to its stop and quickly release it. Do not hold the treadle down after the machine has been started.

(b) The machine will automatically make its cycle of 16 stitches and stop with the needle raised to its highest position.

WARNING

Do not raise the button clamp until the machine has stopped as a broken needle may result and cause injury to personnel.

(4) Removing Material from Machine.

(a) Press firmly on the left foot treadle to raise the clamp.

This step cuts the thread from the looper under the needle.

(b) Pull the attached button sewn from the jaws of the button clamp.

(5) Set motor switch to the OFF position.

2-15. OPERATING INSTRUCTIONS FOR GROMMET PRESS.

- a. *Punching Holes.* Use a hammer and a punch to punch holes through the material or cloth for insertion of the snap fastener parts. A flat piece of wood placed under the cloth will provide the solid surface needed in using the punch.
- b. *Selecting Chucks and Dies.* Select the proper chuck and die to fit the particular snap fastener set being used.
- c. *Inserting Chucks and Dies (Refer to Figure 2-55).*

NOTE

All chucks and dies are inserted in same manner.

- (1) Installing Chuck.

- (a) Loosen the chuck setscrew in the plunger.

- (b) Insert the chuck all the way into the plunger with the flat side of the chuck shaft facing the setscrew. Tighten the setscrew.

NOTE

When the flat side of the chuck is facing the setscrew, the numerals on the chuck will face the operator.

- (3) Installing Die(

- (a) Loosen the die setscrew in the lower part of the grommet press.

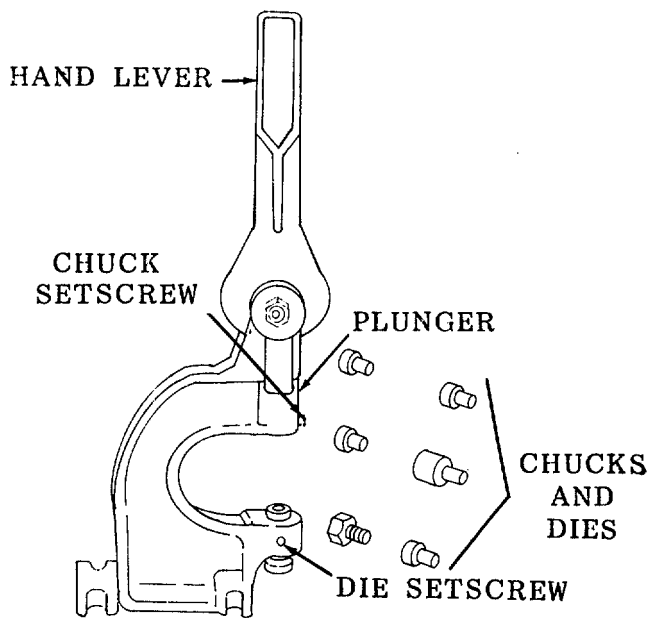


Figure 2-55. Chuck and Die, Installation.

- (c) Drop the die into position with the flat side of the die toward or facing the setscrew.

NOTE

When flat side of the die shaft is facing the set- screw, the numerals on the die will face the operator.

- (d) Tighten the die setscrew securely.

2-15. OPERATING INSTRUCTIONS FOR GROMMET PRESS - Continued.

d. Inserting Snap Fastener Set in Chuck and Die. A snap fastener set consists of a socket assembly (female portion) and a stud assembly (male portion) as shown in Figure 2-56. The female portion consists of a socket (or cap) and a clinch plate (or socket). The male portion consists of a stud and a washer (or post) depending upon the style of the snap fastener set. Either the female portion or the male portion may be installed or fastened in material separately or independently of the other portion.

- (1) To install the female portion insert or snap the appropriate socket (or cap) firmly into the chuck. The socket should fit snugly in the chuck. Place the appropriate clinch plate (or socket) in the die so the prongs on the clinch plate point upward.
- (2) To install the male portion insert or snap the appropriate stud up into the chuck. Place appropriate washer (or post) in the die.

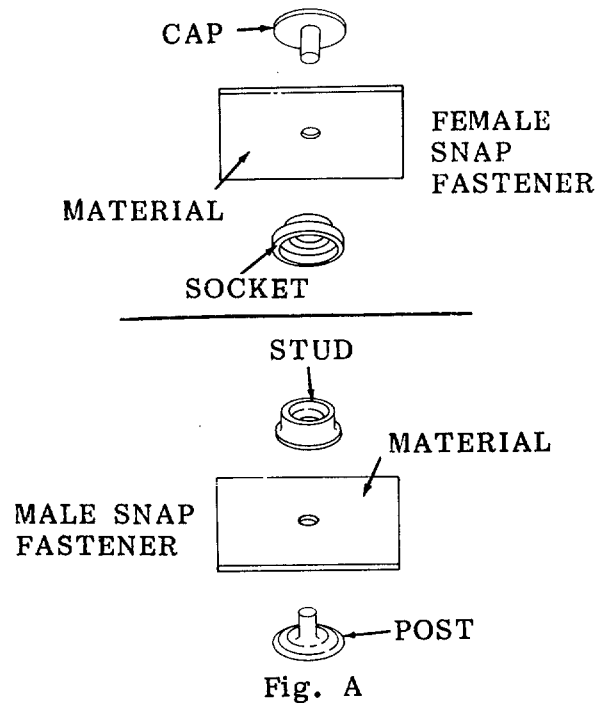


Figure 2-56. Snap Fastener, Installation.

e. Operating the Grommet Press. After the grommet press has been prepared for operation including installation of the appropriate die and chuck and snap fastener parts, proceed as follows to operate the grommet press.

- (1) Place the material or cloth over the die and under the chuck with the snap fastener parts in them. The hole or holes in the material should coincide exactly with the hole or holes in the snap fastener parts. Position the hole in the material over the center of the washer or over the stem of the post for the male portions of the snap fastener sets. Be sure to keep the hand lever all the way up whenever inserting material in the grommet press.

2-15. OPERATING INSTRUCTIONS FOR GROMMET PRESS - Continued.

e. Operating the Grommet Press - Continued.

(2) Depress the hand lever firmly to apply pressure to attach the snap fastener parts to the material securely.

f. Removal of Material, Chuck and Die.

(1) To remove material, raise the hand lever, and remove the material (with snap fastener parts) from the grommet press.

(2) Remove the chuck by loosening the setscrew in the plunger, and lifting the chuck from the plunger. Tighten the setscrew securely.

(3) Remove the die by loosening the setscrew in the lower part of the grommet press, and lift the die from the grommet press. Tighten the setscrew securely.

2-16. OPERATING INSTRUCTIONS FOR TACK-BUTTON ATTACHING MACHINE.

a. Die Selection. Select the appropriate upper die either for the closed- top button or the open-top button. Use the appropriate lower die, depending upon the diameter of the tackhead being used.

(1) Loosen the screw in the plunger and insert the appropriate upper die into the plunger with the flat side facing the screw. Tighten the screw securely.

(2) Loosen the lower die screw and drop or insert the appropriate lower die into the hole in the frame. Do not fasten the lower die in position until the pinch has been adjusted properly as described below.

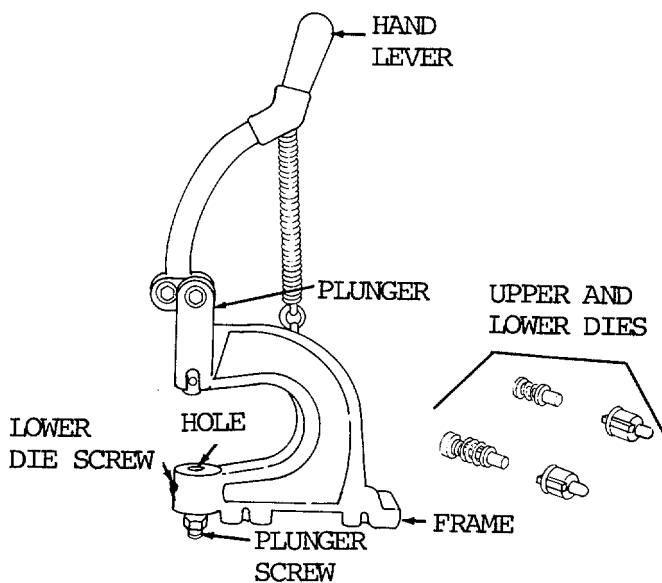


Figure 2-57. Die, Installation.

2-16. OPERATING INSTRUCTIONS FOR TACK-BUTTON ATTACHING MACHINE - Continued.

b. Adjusting Pinch. Use and insert sample testing material in the tack- button attaching machine, and adjust the pinch as follows:

(1) Refer to Figure 2-58. Turn the screw in the base of the ma- chine to obtain the proper pinch on the material. Adjust the pinch until the button is just tight on the material. Test the pinch by operating the tack-button attaching machine.



If the pinch is too tight the material will be cut.

(2) Tighten the lower die screw holding the lower die in the machine when the pinch has been adjusted properly.

c. Operating the Tack-Button Attaching Machine. After the tack-button attaching machine has been prepared for operation, operate it as follows:

(1) Refer to Figure 2-58. Raise the hand lever and slip the closed- top button into the upper die so that the wires on the die fit and snap firmly over the button edge.

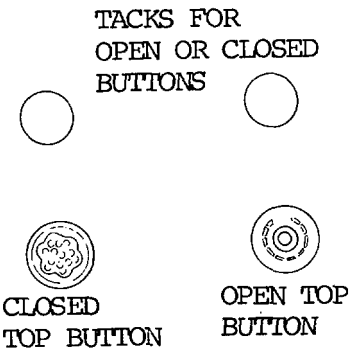


Figure 2-58. Tack Buttons

(2) Drop the tack into the lower die with the tack prong pointed toward the upper die. When using the double- pronged tack, aline the prongs so that when the hand lever is depressed, the prongs will pass freely into the holes in the bottom.

(3) Place cloth or material over the lower die and the tack.

(4) Depress the hand lever firmly, clamping the button (that is in the upper die) upon the tack (that is in the lower die) on the material.

2-17. PREPARATION FOR MOVEMENT.

- a. Fire Extinguisher. Place the fire extinguisher into its storage bracket and close the bracket.
- b. Power Cables and Light Cords. Turn off generator set in accordance with TM 5-6115-271-14. Disconnect all power cables and light cords and stow in the proper storage boxes (Boxes 2, 3, and 4).
- c. Tack-Button Attaching Machine (Refer to Figure 2-59).

LEGEND:

- 1. Tack-Button Machine
- 2. Nut
- 3. Washer
- 4. Bolt
- 5. Washer
- 6. Table

- (1) Remove four nuts (2), four washers (3), four bolts (4), and four washers (5).
- (2) Remove the tack-button machine (1) and stow in storage box number 1.
- (3) Reinstall four washers (5), four bolts (4), four washers (3), and four nuts (2) into holes in table.

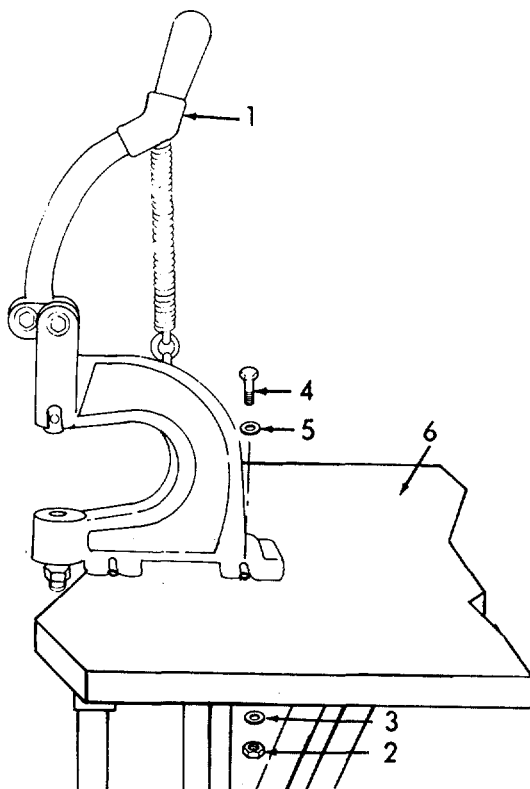


Figure 2-59. Tack-Button Attaching Machine, Removal.

2-17. PREPARATION FOR MOVEMENT-Continued.

d. *Grommet Press (Refer to Figure 2-60).*

LEGEND:

1. Grommet Press
2. Nut
3. Washer
4. Bolt
5. Washer
6. Table

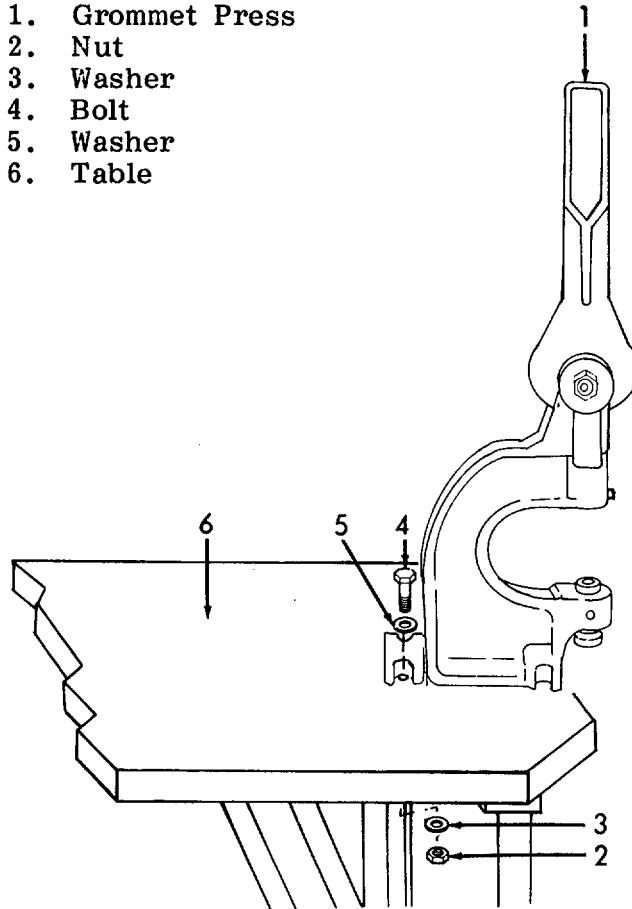


Figure 2-60. Grommet Press, Removal.

- (1) Remove four nuts (2), four washers (3), four bolts (4), and four washers (5).
 - (2) Remove grommet press (1) and stow in storage box number 1.
 - (3) Reinstall four washers (5), four bolts (4), four washers (3) and four nuts (2) into table (6).
- e. *Disassembly of Button Sewing Machine (Refer to Figures 2-61 and 2-62).*
- (1) Remove thread unwinder (1) and stow in storage box number 3.
 - (2) Remove pulley belt and stow in storage box number 3.
 - (3) Loosen thumbscrew (2) and tilt head (3) back.
 - (4) Disconnect chains from machine levers and treadles. Stow chains in storage box number 3.

2-17. PREPARATION FOR MOVEMENT-Continued.

e. Disassembly of Button Sewing Machine-Continued.

- (5) Remove three nuts (4), three washers (5), and three bolts (5) and tape hardware into base of machine.
- (6) Close head (3) and secure with thumbscrew (2). (7) Remove button sewing machine
- (7) from table (8) and into tray (located in cabinet) labeled 60010.
- (8) Place strap over machine head.
- (9) Connect and tighten wingnut.
- (10) Push tray back into cabinet.

LEGEND:

- | | |
|---------------|--------------------------|
| 1. Unwinder | 5. Washer |
| 2. Thumbscrew | 6. Bolt |
| 3. Head | 7. Button Sewing Machine |
| 4. Nut | 8. Table |

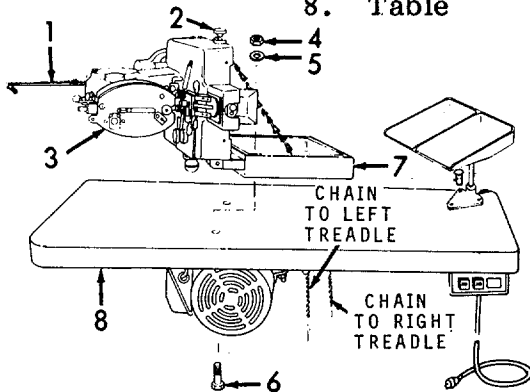


Figure 2-61. Button Sewing Machine, Removal.

LEGEND:

- | | |
|---------------|-------------------|
| 1. Nut | 6. Flatwasher |
| 2. Stud | 7. Bolt |
| 3. Table Top | 8. Crossbrace |
| 4. Wingnut | 9. Wingnut |
| 5. Lockwasher | 10. Folding Stand |

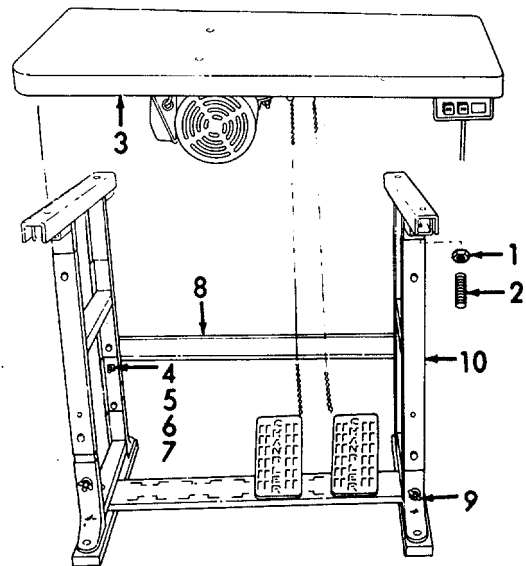


Figure 2-62. Button Sewing Machine Table, Disassembly.

- (11) Refer to Figure 2-62. Loosen nuts (1) and then loosen studs (2) from table top (3).
- (12) Lift off table top (3) and place upside down on table with folding legs.
- (13) Remove light assembly from table top and fix to motor using the strap.
- (14) Remove two wingnuts (4), two lockwashers (5), two flatwashers (6), two bolts (7), and crossbrace (8).
- (15) Loosen wingnuts (9).
- (16) Pull the ends up and out of the bottom of the stand.
- (17) Fold the ends of the folding stand (10).

2-17. PREPARATION FOR MOVEMENT-Continued.

e. Disassembly of Button Sewing Machine-Continued.

(18) Tighten the two wingnuts (9).

(19) Install crossbrace (8), and secure with two bolts (7), two flatwashers (6), two lockwashers (5), and two wingnuts (4).

(20) Place folding stand (10) into cabinet.

f. Disassembly of Darning Sewing Machine (Refer to Figures 2-63 and 2-64).

(1) Refer to Figure 2-63. Remove sewing machine rest (1) and store in storage box number 3.

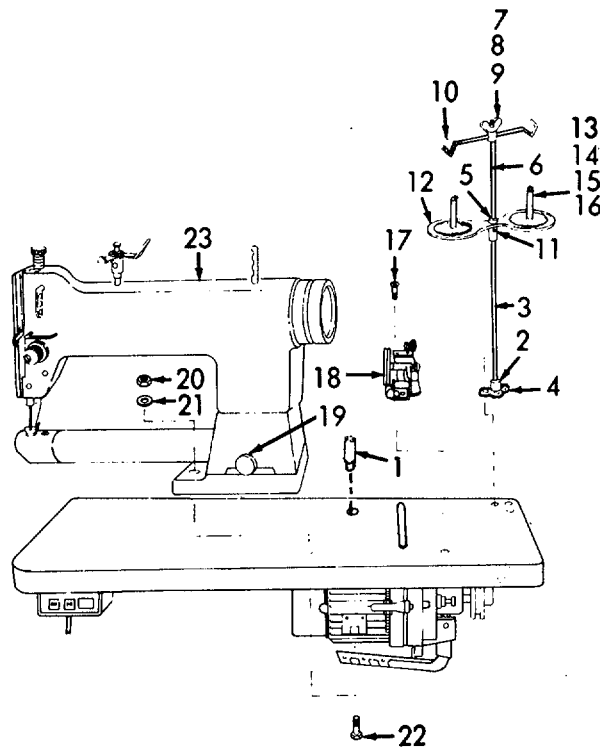


Figure 2-63. Darning Sewing Machine, Removal.

LEGEND:

- | | |
|------------------|--------------------|
| 1. Machine Rest | 12. Cone Rest |
| 2. Nut | 13. Post |
| 3. Bottom Post | 14. Flatwasher |
| 4. Unwinder Base | 15. Nut |
| 5. Nut | 16. Pad |
| 6. Top Post | 17. Wood Screw |
| 7. Wingnut | 18. Bobbin Winder |
| 8. Washer | 19. Thumbscrew |
| 9. Clip | 20. Nut |
| 10. Thread Guide | 21. Washer |
| 11. Setscrew | 22. Bolt |
| | 23. Sewing Machine |

2-17. PREPARATION FOR MOVEMENT-Continued.*f. Disassembly of Darning Sewing Machine-Continued.*

- (2) Loosen nut (2) and remove bottom post (3) from unwinder base (4).
- (3) Loosen nut (5) and remove top post (6) from bottom post (3).
- (4) Remove wingnut (7), washer (8), clip (9), and thread guides (10).
- (5) Loosen setscrew (11) and remove cone rest (12) from bottom post (3).
- (6) Remove two posts (13), two flatwashers (14), two nuts (15), two pads (16), and cone rest (12).
- (7) Stow all parts of thread unwinder base in storage box number 3.
- (8) Remove three wood screws (17) and bobbin winder (18). Stow bobbin winder in storage box number 3.
- (9) Loosen thumbscrew (19) and tilt head back.
- (10) Remove pulley belt and stow in storage box number 3.
- (11) Remove light assembly from table top and strap to motor with strap provided.
- (12) Remove three nuts (20), three washers (21), and three bolts (22). Stow hardware into sewing machine (23) base.
- (13) Close machine head and secure with thumbscrew (19).
- (14) Place sewing machine head into tray labeled 678HD.
- (15) Fold strap over machine head.
- (16) Connect and tighten wingnut.
- (17) Push tray back into cabinet.
- (18) Refer to Figure 2-64. Disconnect treadle rod (1) from clutch arm (2).

2-17. PREPARATION FOR MOVEMENT-Continued.

f. Disassembly of Darning Sewing Machine-Continued.

- (19) Loosen four nuts (3) and loosen the four studs (4) from the table top (5).
- (20) Lift off table top (5) and set it upside down on the table with the folding legs.
- (21) Remove two wingnuts (6), two lockwashers (7), two flatwashers (8), two bolts (9), and crossbrace (10).
- (22) Loosen both wingnuts (11).
- (23) Pull the ends of the stand up and out of the foot section (12).
- (24) Fold the ends of the stand in.

LEGEND:

- | | |
|----------------|-------------------|
| 1. Treadle Rod | 7. Lockwasher |
| 2. Clutch Arm | 8. Flatwasher |
| 3. Nut | 9. Bolt |
| 4. Stud | 10. Crossbrace |
| 5. Table Top | 11. Wingnut |
| 6. Wingnut | 12. Foot Section |
| | 13. Folding Stand |

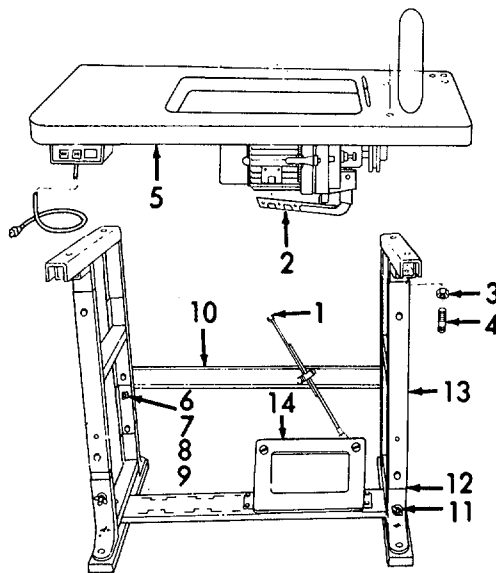


Figure 2-64. Darning Sewing Machine Table, Disassembly.

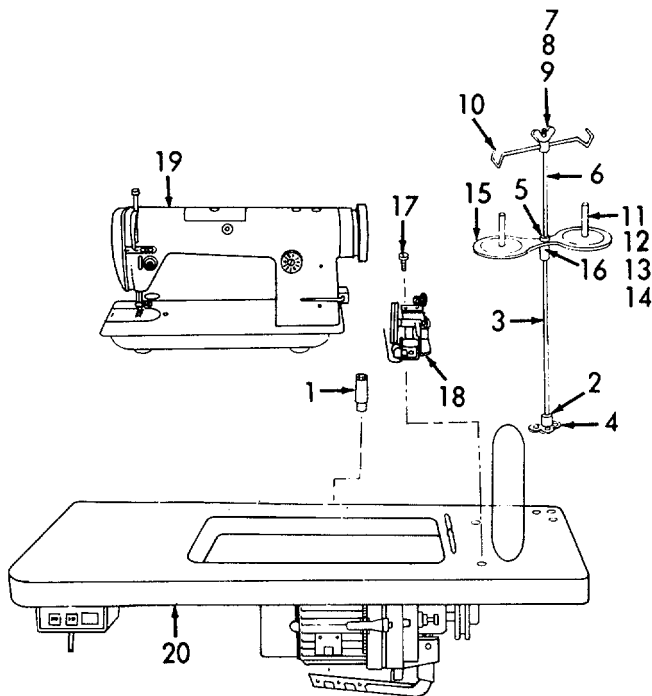
- (25) Install crossbrace (10), two bolts (9), two flatwashers (8), two lockwashers (7), and two wingnuts (6).
- (26) Tighten wingnuts (11).
- (27) Place folding stand (13) into cabinet.

g. Disassembly of Clothing Sewing Machine (Refer to Figure 2-65).

- (1) Refer to Figure 2-65. Remove sewing machine rest (1) and stow in storage box number 3.
- (2) Loosen nut (2) and remove bottom post (3) from unwinder base (4).

2-17. PREPARATION FOR MOVEMENT-Continued.

g. Disassembly of Clothing Sewing Machine-Continued.



LEGEND:

- | | |
|------------------|--------------------|
| 1. Machine Rest | 11. Post |
| 2. Nut | 12. Flatwasher |
| 3. Bottom Post | 13. Nut |
| 4. Base | 14. Pad |
| 5. Nut | 15. Cone Rest |
| 6. Top Post | 16. Setscrew |
| 7. Wingnut | 17. Wood Screw |
| 8. Washer | 18. Bobbin Winder |
| 9. Clip | 19. Sewing Machine |
| 10. Thread Guide | 20. Table Top |

Figure 2-65. Clothing Sewing Machine, Removal.

- (3) Loosen nut (5) and separate top post (6) from bottom post (3).
- (4) Remove wingnut (7), washer (8), Nut clip (9), and thread guides (10) from top post (6)
- (5) Remove two posts (11), two flatwashers (12), two nuts (13), and two pads (14) from cone rest (15).
- (6) Loosen setscrew (16) and remove cone rest (15) from bottom post (3).
- (7) Stow all parts of thread unwinder in storage box number 3.
- (8) Remove two wood screws (17) and bobbin winder (18). Stow bobbin winder in storage box number 3.
- (9) Remove pulley belt and stow in storage box number 3.
- (10) Remove light assembly from table top and strap to motor.
- (11) Remove clothing sewing machine (19) from table (20) and place in tray labeled C765.
- (12) Place strap over machine head and tighten both wingnuts.
- (13) Push the tray into the cabinet.
- (14) Disassemble the stand in accordance with paragraph 2-17f, steps (18) through (27).

2-17. PREPARATION FOR MOVEMENT-Continued.

h. Sewing Machine Tables Assemblies, Folding Stands, and Storage Boxes Installation (Refer to Figures 2-66 through 2-68).

- (1) Refer to Figure 2-66. Verify that all tools and equipment listed in Table 2-6 are in the storage boxes.
- (2) Slide the storage boxes (1) into the cabinet.

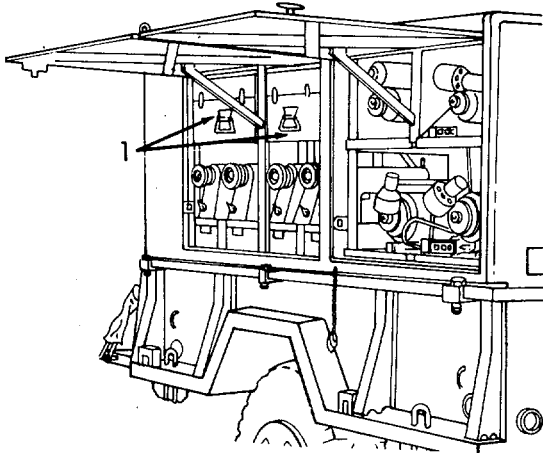
LEGEND:**1. Storage Box**

Figure 2-66. Storage Boxes, Installation.

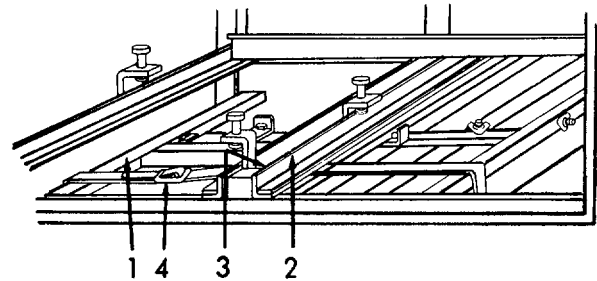
LEGEND:**1. Folding Stand****2. Crossbrace****3. Pin****4. Strap**

Figure 2-67. Folding Stands, Installation.

- (3) Refer to Figure 2-67. Make sure that all folding stands (1) are stowed in cabinet.
- (4) Install crossbrace (2) and secure with pin (3).
- (5) Fasten the straps (4) to secure the folding stands.
- (6) Repeat steps (3) through (5) for the other side.

2-17. PREPARATION FOR MOVEMENT-Continued.

h. Sewing Machine Table Assemblies, Folding Stands, and Storage Boxes Installation-Continued.

(7) Refer to Figure 2-68. Place table tops (1) into the cabinet with their labels facing outward.

NOTE

Make sure that the table tops are placed into the proper slide by matching the label on the table top with that on the slide.

(8) Tighten the locking clamps.

LEGEND:

- 1. Table Tops

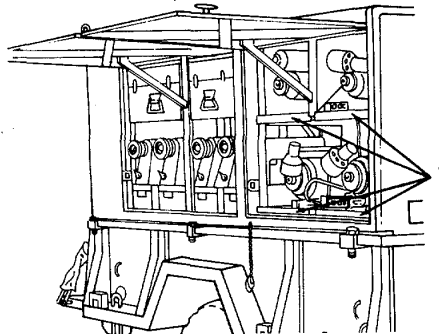


Figure 2-68. Table Tops, Installation.

i. Loading the Generator Set (Refer to Figure 2-69).

WARNING

The generator set weighs approximately 300 lbs. (660 kg). Four persons are required to lift the generator set.

(1) Lift the generator set (1) up and then slide it into the cabinet on the tracks.

(2) Install the holddown bracket (2).

(3) Install the two wing bolts (3).

LEGEND:

- 1. Generator Set
- 2. Holddown Bracket
- 3. Wing Bolt

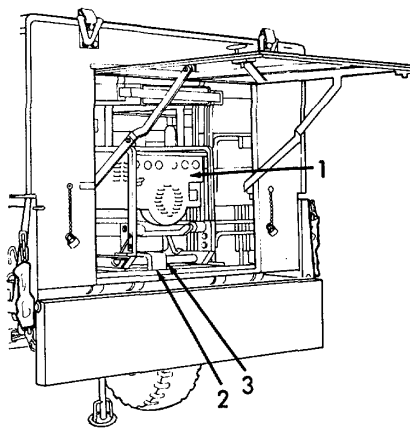


Figure 2-69. Generator Set, Installation.

2-17. PREPARATION FOR MOVEMENT-Continued.

j. Raising the Rear Support Leg (Refer to Figure 2-70).

- (1) Screw in the base plate on the leg (1).
- (2) Raise the support leg (1) while pushing on the lever (2).

LEGEND:

- 1. Support Leg
- 2. Lever

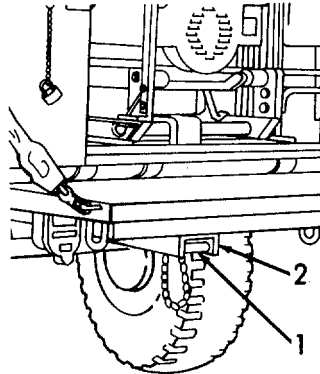


Figure 2-70. Lowering the Rear Support Leg.

SECTION IV. OPERATION UNDER UNUSUAL CONDITIONS

	Para.		Para.
Operation in Extreme Heat and Extreme Cold.....	2-19	Operation Under Unusual Conditions.....	2-18
Operation in Sandy and Dusty Areas	2-20	Operation Without Electrical Power.....	2-21

2-18. OPERATION UNDER UNUSUAL CONDITIONS.

This section covers the necessary operating instructions, in addition to those previously covered, that are necessary for the components of the clothing repair shop to function properly under unusual conditions, such as in extreme heat and cold and in dusty and sandy areas.

2-19. OPERATION IN EXTREME HEAT AND COLD AREAS. Extremes of heat and cold have little or no effect upon the operation of the clothing repair shop. Extremes of humidity, require the sewing machines to be lubricated (Chapter 3, Section I) more frequently because even ordinary humidity will cause the machines to rust or to corrode unless they are kept thoroughly oiled. Also, extremes of humidity will cause the thread to deteriorate and break easily during operation. All possible precautions should be taken to keep the thread dry.

2-20. OPERATION IN SANDY AND DUSTY AREAS.

In extremely sandy and dusty areas, the working parts of the sewing machines will require more frequent cleaning and lubrication (Chapter 3, Section I). Be sure to remove all sand or grit from the material to be stitched; sand or grit will work into the parts of the machines and cause unnecessary wear.

2-21. OPERATION WITHOUT ELECTRICAL POWER.

(Refer to Figure 2-71).

- a. Place pulley (1) into position.
- b. Install washer (2), bolt (3), washer (4), and nut (5).
- c. Install a pulley belt (8) between machine pulley and pulley (1). Refer to Appendix F for belt fabrication instructions.
- d. Connect rod (6) to treadle rod (7).
- e. Pump treadle with foot to operate sewing machine.

LEGEND:

- | | |
|-----------|----------------|
| 1. Pulley | 5. Nut |
| 2. Washer | 6. Rod |
| 3. Bolt | 7. Treadle Rod |
| 4. Washer | 8. Pulley Belt |

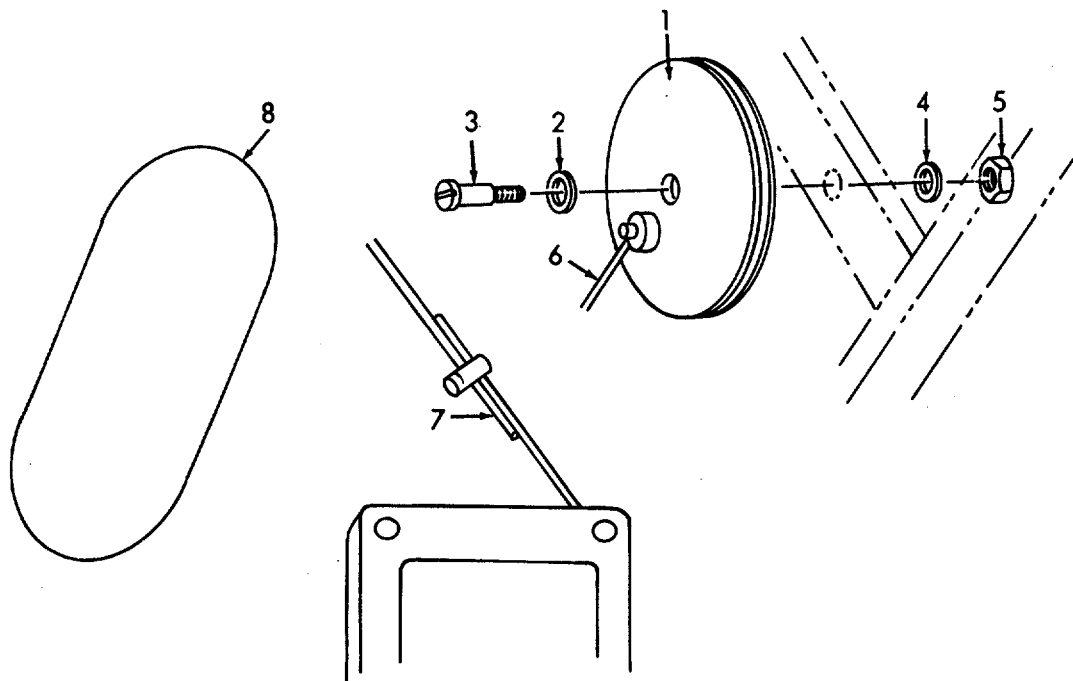


Figure 2-71. Pulley, Installation.

**CHAPTER 3
OPERATOR MAINTENANCE INSTRUCTIONS**

- Section I. LUBRICATION INSTRUCTIONS
- Section II. OPERATOR TROUBLESHOOTING
- Section III. OPERATOR MAINTENANCE

SECTION I. LUBRICATION INSTRUCTIONS

	Para.		Para.
Detailed Lubrication Instructions	3-2	General.....	3-1
		Lubrication Order	3-3

3-1. GENERAL.

a. Lubrication instructions for the clothing repair shop equipment are covered by Lubrication Orders. Lubrication instructions for generator set are contained in TM 9-2330-213-14.

b. Lubricate or oil the latches, hinges, and pivot points of the cabinet assembly, storage boxes, folding chairs, and tables when and if they become difficult to operate.

3-2. DETAILED LUBRICATION INSTRUCTIONS.

a. Keep all lubricants in closed containers and store them in a clean, dry place away from external heat. Do not allow lint, dust, dirt, or other foreign matter to mix with lubricants. Keep all lubrication equipment clean and ready for use.

b. Keep all external parts that do not require lubrication free of lubricants. Before lubricating, clean lint, dust, or grease from the lubrication points as described in the lubrication order. c. Operate the machines immediately after lubrication to distribute the oil to all moving parts.

3-3. LUBRICATION ORDERS.

The Lubrication Orders for the clothing repair shop equipment are LO 10-3530205-12-1, LO 10-3530-205-12-2, LO 10-3530-205-12-3 and LO 10-3530-205-12-4.

SECTION II. OPERATOR TROUBLESHOOTING

General	Para. 3-4	Troubleshooting Table.....	Para. 3-6
Symptom Index	3-5		

3-4. GENERAL.

a. The table in this section lists the common malfunctions which may occur during the operation or maintenance of the clothing repair shop or components. The troubleshooting should be performed in the order given in each malfunction.

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

c. To troubleshoot the generator set, refer to TM 5-6115-271-14. To troubleshoot the cargo trailer, refer to TM 9-2330-213-14.

3-5. SYMPTOM INDEX.

Symptom	Page
Cabinet Assembly	
Holddown clamp assembly loose.....	3-4
Rear door or any side door cannot be opened	3-4
Rear door or any side door does not close.....	3-5
Rear door or any side door will not stay in open position	3-5
Sewing machine head is loosely mounted in tray.....	3-5
Storage box does not close securely	3-5
Generator is loosely mounted on slides	3-6
Sewing machine trays or table assemblies stick or slide unevenly	3-6
Clothing Sewing Machine	
Needle breaks	3-6
Needle thread breaks	3-7
Bobbin thread breaks	3-9
Stitches skip or fail to lock.....	3-10
Seams draw	3-11
Thread snarls at beginning of seam.....	3-11
Thread snarls during stitching.....	3-11

3-5. SYMPTOM INDEX-Continued.

Symptom	Page
Clothing Sewing Machine - Continued	
Thread snarls at end of seam	3-12
Bobbin thread cannot be raised through hole in throat plate 3-12	
Feed dogs strike throat plate	3-12
Presser foot pressure regulator thumbscrew is hard to adjust 3-13	
Machine vibrates.....	3-13
Lamp does not light.....	3-13
Motor does not start	3-14
Unusual noise in motor.....	3-14
Motor does not pull load.....	3-14

Darning Sewing Machine

Needle breaks 3-15	
Needle thread breaks	3-16
Bobbin thread breaks	3-17
Stitches skip or fail to lock.....	3-18
Seams draw 3-19	
Thread snarls at beginning of darn	3-19
Thread snarls during darn.....	3-19
Thread snarls at end of darn.....	3-20
Bobbin thread cannot be raised through hole in throat plate:3-20	
Presser foot pressure regulator thumbscrew is hard to adjust 3-20	
Machine vibrates.....	3-21
Lamp does not light.....	3-21
Motor does not start	3-22
Unusual noise in motor.....	3-22
Motor does not pull load.....	3-22

Button Sewing Machine

Needle breaks 3-23	
Thread breaks 3-24	
Lamp does not light.....	3-25
Motor does not start	3-26
Unusual noise in motor.....	3-26
Motor does not pull load.....	3-26

Grommet Press

Handlever sticks on downstroke	3-27
Fasteners are loose.....	3-27
Machine cuts material	3-27

3-5. SYMPTOM INDEX-Continued.

Symptom Tack-button Attaching Machine	Page
Handlever sticks on downstroke	3-27
Upper die does not hold button firmly	3-27
Double pronged tack does not fit properly into holes in button	3-27
Machine cuts material	3-28
Shank of lower die binds	3-28

3-6. TROUBLESHOOTING TABLE.

NOTE

Before you use the troubleshooting tables, be sure you have performed all applicable operating checks and verified that a malfunction exists. When a corrective action is performed, verify that the action has corrected the malfunction. All malfunction deferred to the next higher level of maintenance must be reported according to the instructions given in DA PAM 738-750.

Table 3-1. Operator Troubleshooting

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

CABINET ASSEMBLY

1. HOLDDOWN CLAMP ASSEMBLY LOOSE.

Check capscrew, clamp arm, and machine screws.

If capscrew, clamp arm, machine screws or nuts are loose or obviously damaged, notify next higher level of maintenance.

2. REAR DOOR OR A SIDE DOOR CANNOT BE OPENED.

Step 1. Inspect door for dirty, cut, broken, or dented surfaces; broken welds; and a bad door gasket.

a. Clean dirty surfaces using soap and water.

Table 3-1. Operator Troubleshooting-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
CABINET ASSEMBLY		
		b. Notify next higher level of maintenance for cut, broken, dented surfaces or welds, and bad door gasket.
	Step 2.	Check that folding handle lock is not bent, broken, loosely mounted or missing. If folding hand lock is defective or missing, notify next higher level of maintenance.
	Step 3.	Check that door hinge is not broken or bent. If door hinge is broken or bent, notify next higher level of maintenance.
3.	REAR DOOR OR SIDE DOOR DOES NOT CLOSE. Inspect door for the same defects as malfunction No. 2.	
4.	REAR OR SIDE DOOR WILL NOT STAY IN OPEN POSITION. Check door stays for mechanical binding and loose or missing door stay mounting brackets. Notify next higher level of maintenance if door stays will not lock into position due to binding or loose or missing mounting brackets.	
5.	SEWING MACHINE HIEAD IS LOOSELY MOUNTED IN TRAY.	
	Step 1.	Check that tray strap assembly holddown thumbscrew is tight. Tighten thumbscrew.
	Step 2.	Check that tray strap assembly hinge (on tray) is not loosely mounted. If strap assembly is loose, notify next higher level of maintenance.
6.	STORAGE BOX DOES NOT CLOSE SECURELY.	
	Step 1.	Check that storage box hinge is not bent or broken. If hinge is bent or broken, notify next higher level of maintenance.

Table 3-1. Operator Troubleshooting-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
CABINET ASSEMBLY		
7.	GENERATOR IS LOOSELY MOUNTED ON SLIDES.	<p>Step 2. Check that storage box latch and latch hook are not deformed or broken. If latch or latch hook are deformed or broken, notify next higher level of maintenance.</p> <p>Check that front and rear generator holddown brackets are in place and secure. Install front and rear holddown brackets.</p>
8.	SEWING MACHINE TRAYS OR TABLE ASSEMBLIES STICK OR SLIDE UNEVENLY.	<p>Check condition of felt material on tray or table slides.</p> <p>If felt is worn out or missing, notify next higher level of maintenance.</p>
CLOTHING SEWING MACHINE		
9.	NEEDLE BREAKS.	<p>Step 1. Needle might have become bent or blunted and hit presser foot and/or throat plate.</p> <p>Replace broken needle with new needle of correct size, class, and variety (paras. 2-12a and 2-12b).</p> <p>Step 2. Needle may have had a burr on the point or the eye may have become very dirty.</p> <p>Replace broken needle with new needle of correct size, class, and variety (paras. 2-12a and 2-12b).</p> <p>Step 3. Needle may have been too fine (wrong size or variety) for the fabric being sewed or the job being done.</p> <p>Replace broken needle. Be sure it is of the correct size, class, and variety for the fabric being worked and the job to be done (paras. 2-12a and 2-12b).</p> <p>Step 4. You may have inserted the needle incorrectly.</p>

Table 3-1. Operator Troubleshooting-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
CLOTHING SEWING MACHINE		
		Replace broken needle with new needle of correct size, class, and variety (paras. 2-12a and 2-12b). Be sure needle is inserted into the needle bar correctly (paras. 2-12a and 212b).
Step 5.	Check machine settings.	<p>a. Machine settings may have accidentally changed during stitching. Check machine settings and make sure they are correct by following operating instructions of paras. 2-12k and 2-121.</p> <p>b. Replace broken needle with new needle of correct size, class, and variety (paras. 2-12a and 2-12b).</p>
Step 6.	Presser foot may have become loose or the throat plate may have moved from full in position.	<p>a. Replace broken needle with new needle of correct size, class, and variety (paras. 2-12a and 2-12b).</p> <p>b. If presser foot is loose, notify next higher level of maintenance.</p>
Step 7.	You may have pulled too hard on the fabric while stitching.	<p>a. Do not pull on fabric while stitching. Allow the feed dogs to pull the fabric while stitching. Follow operating instructions para. 2-12j.</p> <p>b. Replace broken needle with new needle of correct size, class, and variety (paras. 2-12a and 2-12b).</p>
Step 1.	Check that needle is not installed backward or needle eye is not threaded backward. Check that threading is correct.	<p>a. If needle is installed backward, reinstall needle correctly in needle bar clamp (para. 2-12b).</p> <p>b. Needle should be threaded from left to right through the needle eye and machine must be threaded correctly (para. 2-12c).</p>

Table 3-1. Operator Troubleshooting-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
Step 2.	Check that thread is not caught in spool notch or wrapped around spool spindle.	<ul style="list-style-type: none"> a. Clear wrap-around spindle if necessary and rethread machine (para. 2-12c). b. If spool notch is burred or damaged, notify next higher level of maintenance.
Step 3.	Check for rough or burred places on thread guides, presser foot, needle eye, or throat plate hole.	If rough or burred places are found-, notify your supervisor.
Step 4.	Check for bent needle or blunted needle point.	Discard bent or blunted needle and replace with a new needle of correct size, class and variety (paras. 2-12a and 212b).
Step 5.	Check that needle is all the way up in needle bar and the needle bar is tight.	Insert needle all the way up into needle bar and tighten needle bar clamp (para 2-12b).
Step 6.	Check for sharp, rough, or burred edges on rotary-sewing hook, bobbin case, or tension controls. If defective parts are found, notify supervisor.	
Step 7.	Check thread size against needle size.	<ul style="list-style-type: none"> a. Be sure you have selected the right thread weight for the needle being used. It may be too heavy. b. If the wrong thread is being used, remove thread and rethread machine with the correct weight thread.
Step 8.	Check that thread is left-twist thread.	If thread is right-twist thread, remove thread and replace with left-twist thread. Rethread machine (para. 2-12c).

Table 3-1. Operator Troubleshooting-Continued

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

CLOTHING SEWING MACHINE

11. BOBBIN THREAD BREAKS.

- Step 1. Check that bobbin case is threaded correctly and installed correctly. Thread and install bobbin case correctly (paras. 2-12d through 2-12g).
- Step 2. Check bobbin to see that it is not so full of thread as to keep it from revolving freely in the bobbin case.
- Remove excess thread until rounds of thread are even with the rim of the bobbin (para. 2-12e).
- Step 3. Check that rounds of thread on bobbin are not lapped over one another and check that rounds of thread are evenly wound across the bobbin (no ridges or valleys in the rounds).
- Use a correctly wound bobbin or remove thread and rewind bobbin correctly with proper thread (para. 2-12e).

NOTE

In Steps 2 and 3 above, the problem could be misadjustment of bobbin winder. Notify next higher level of maintenance for bobbin winder adjustment or reset if this is the case.

- Step 4. Check that bobbin case tension is not too tight. Adjust bobbin case for correct tension (para. 2-12k).
- Step 5. Check that bobbin case is not sticky with oil and lint.
- If bobbin case is sticky, notify your supervisor.
- Step 6. Check that rough, sharp, or burred edges on rotary-sewing hook, bobbin, and bobbin case. If defects are found, notify your supervisor.
- Step 7. Check that thread being used is not damp, old, or dried out. Discard damp, old, or dried out thread. Rewind bobbin with fresh, dry, smooth thread of the correct weight (para. 2-12e).

Table 3-1. Operator Troubleshooting-Continued

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

CLOTHING SEWING MACHINE

12. STITCHES SKIP OR FAIL TO LOCK.

NOTE

The most common cause of fail-to-lock or skipped stitches is using the wrong needle for the fabric being sewed. Always use the correct size, class, and variety needle recommended for the fabric being worked.

- Step 1. Check that needle size, class, and variety is right for the in work.
If needle is incorrect, replace needle with new needle of correct size, class and variety (paras. 2-12a and 2-12b).
- Step 2. There may not be enough pressure on the presser foot for the fabric being worked.
Vary pressure of presser foot using pressure regulator to try and correct trouble.
- Step 3. You may be pulling on the fabric while stitching.
Do not pull on fabric while stitching. Let the feed dogs move the fabric under the needle. You should only guide the fabric while stitching.
- Step 4. Check that needle is not blunted or bent. If blunted or bent, replace needle with a new needle of correct size, class, and variety (paras. 2-12a and 2-12b).

NOTE

Even if you see nothing wrong with the needle, it may have accumulated lint or sizing from the fabric. This can happen with certain synthetics and permanent press fabrics or in stitching through adhesives. Clean the needle or change it if this problem is suspected.

- Step 5. Needle bar is out of adjustment.
Notify your supervisor.

Table 3-1. Operator Troubleshooting-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
CLOTHING SEWING MACHINE		
13. SEAMS DRAW.	Step 1.	Needle thread or bobbin thread tension too tight. Adjust needle thread and bobbin thread to correct tension (para. 2-12k).
	Step 2.	Stitches are too long for the fabric(s) being worked. Vary stitch length regulator to try and correct this problem.
14. THREAD SNARLS AT BEGINNING OF SEAM.	NOTE	
	<i>Snarls at the start of a seam can usually be prevented by manually placing needle into fabric before lowering presser foot. Be sure you have both needle and bobbin threads under the presser foot and drawn to the rear. Hold both thread ends for the first sew stitches.</i>	
	Thread and/or fabric are probably pulled down into the bobbin area.	
	<ul style="list-style-type: none"> a. To release snarl, turn handwheel back and forth a few times to loosen the caught material. Remove the material and snarled thread and observe the note above before resuming work. b. Check that machine is threaded correctly. Rethread machine if necessary (para. 2-12c). 	
15. THREAD SNARLS DURING STITCHING.	Step 1.	Lint from the bobbin area may be caught in the stitching. Clean bobbin area of lint (para. 2-12e).
	Step 2.	Bobbin thread may be running out. Replace bobbin with one fully wound (paras. 2-12d through 2-12g).
	Step 3.	Needle thread or bobbin thread tensions may be incorrect.

Table 3-1. Operator Troubleshooting-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
CLOTHING SEWING MACHINE		
		Adjust needle thread and bobbin thread to correct tension (para. 2-12k).
	Step 4.	Machine timing may be off.
		Notify your supervisor.
16.	THREAD SNARLS AT END OF SEAM.	
		NOTE
		<i>As a general rule, it is not a good practice to stitch off the fabric. This can cause thread knotting in the bobbin area and snarls at the end of the seam.</i>
	Step 1.	Fabric and thread are being pushed into the bobbin area causing knots.
		Turn the handwheel back and forth a few times to loosen snarl; then remove snarl.
	Step 2.	Check all machine adjustments and readjust as necessary. If trouble still persists, notify your supervisor.
17.	BOBBIN THREAD CANNOT BE RAISED THROUGH HOLE IN THROAT PLATE.	
	Step 1.	Check bobbin case threading. Rethread bobbin case (para. 2-12f).
	Step 2.	Check that bobbin case is seated in rotary-sewing hook correctly.
		Seat bobbin case correctly (para. 2-12g).
18.	FEED DOGS STRIKE THROAT PLATE.	
		Check that throat plate is in the full in position.
		If throat plate is in the full in position but trouble persists, notify next higher level of maintenance.

Table 3-1. Operator Troubleshooting-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
CLOTHING SEWING MACHINE		
19.	PRESSER FOOT PRESSURE REGULATOR THUMBSCREW IS HARD TO ADJUST.	<p>Presser foot may have been lowered before change was made in the pressure setting.</p> <ul style="list-style-type: none"> a. Raise presser foot with hand lifter. Decrease pressure on presser foot by turning the pressure adjusting thumbscrew to the left. Lower presser foot and adjust presser foot to the desired pressure for the fabric being worked. b. If presser foot pressure cannot be increased or decreased, notify your supervisor.
20.	MACHINE VIBRATES.	<ul style="list-style-type: none"> Step 1. Check that machine-to-table mounting screws are tight and check that table is on a flat hard surface. <ul style="list-style-type: none"> a. If any screws are loose, notify your supervisor. b. Relocate table to flat, hard surface, if necessary. Step 2. Machine motor drive belt is probably too tight. Notify next higher level of maintenance. Step 3. Machine drive pulley or balance wheel is out-of-balance, loose, or installed wrong. Notify your supervisor.
21.	LAMP DOES NOT LIGHT.	<ul style="list-style-type: none"> Step 1. Check lamp on-off switch. Set lamp on-off switch to the on position. Step 2. Check that lamp light cord is plugged into power outlet. Plug in light cord into power outlet. Step 3. Check that light bulb is not broken, burned out, or missing. <ul style="list-style-type: none"> a. If light bulb is burned out or missing, notify your supervisor.

Table 3-1. Operator Troubleshooting-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
CLOTHING SEWING MACHINE		
		b. If light bulb is broken, notify your supervisor.
Step 4.	Unplug light cord from outlet and check cord and plug for frayed or broken insulation and wires.	If defective insulation, wiring, or plug is found, notify next higher level of maintenance.
Step 5.	Lamp assembly or lamp on-off switch may be defective.	Notify your supervisor.
	Step 6. Electrical power outlet receptacle may be defective. Notify your supervisor.	
22. MOTOR DOES NOT START.		
Step 1.	Check motor on/off switch.	Set motor on/off switch to on position.
Step 2.	Check that motor power cable is plugged into power outlet. Plug power cable into input power outlet, if necessary.	
Step 3.	Motor on-off switch may be defective.	Notify your supervisor.
Step 4.	Motor may be defective.	Notify your supervisor.
23. UNUSUAL NOISE IN MOTOR.		
	Motor may be defective.	Turn off machine and notify your supervisor.
24. MOTOR DOES NOT PULL LOAD.		
Step 1.	Check to see if motor to sewing machine drive belt is loose, slipping, frayed, or deteriorated.	

Table 3-1. Operator Troubleshooting-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
CLOTHING SEWING MACHINE		
		Turn off motor and notify your supervisor.
	Step 2.	Input voltage to motor may be low or motor may be faulty.
		Turn off motor and notify your supervisor.
DARNING SEWING MACHINE		
25.	NEEDLE BREAKS.	
	Step 1.	Needle might have become bent or blunted and hit presser foot.
		Replace broken needle with new needle of correct size, class, and variety (paras. 2-13a and 2-13b).
	Step 2.	Needle may have had a burr on the point or the eye may have become very dirty.
		Replace broken needle with new needle of correct size, class, and variety (paras. 2-13a and 2-13b).
		Step 3. Needle may have been too fine (wrong size, class, and variety) for the fabric being darned or the job being done.
		Replace broken needle. Be sure it is of the correct size, class, and variety for the fabric being worked and the job to be done (paras. 2-13a and 2-13b).
		Step 4. You may have installed the needle incorrectly.
		Replace broken needle with new needle of correct size, class, and variety (paras. 2-13a and 2-13b). Be sure needle is inserted into the needle bar correctly.
	Step 5.	Check machine settings.
		a. Machine settings may be wrong or they have accidentally changed during mending. Check machine settings and make sure they are correct by following operating instructions of para. 2-13k.
		b. Replace broken needle with new needle of correct size, class, and variety (paras. 2-13a and 2-13b).

Table 3-1. Operator Troubleshooting-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
DARNING SEWING MACHINE		
26.	NEEDLE THREAD BREAKS.	
	Step 1.	<p>Check that needle is not installed backward or needle eye is not threaded backward. Check that threading is correct.</p> <p>a. If needle is installed backward, reinstall needle correctly in needle bar clamp (para. 2-13b).</p> <p>b. Needle should be threaded from left to right through the needle eye and machine must be threaded correctly (para. 2-13c).</p>
	Step 2.	<p>Check that thread is not caught in spool notch or wrapped around spool spindle.</p> <p>Smooth notch in spool or change spools as necessary.</p>
	Step 3.	<p>Check for rough or burred places on thread guides, presser foot, needle eye, and latch guard hole.</p> <p>If rough or burred places are found, notify your supervisor.</p>
	Step 4.	<p>Check for bent needle or blunted needle point. Discard bent or blunted needle and replace with a new needle of correct size, class, and variety (paras. 2-13a and 2-13b).</p>
	Step 5.	<p>Check that needle is all the way up in needle bar and the needle bar clamp is tight. Insert needle all the way up into needle bar and tighten needle bar clamp (para. 2-13b).</p>
	Step 6.	<p>Check for sharp, rough, or burred edges on rotary-sewing hook, bobbin case, or tension controls.</p> <p>If defective parts are found, notify your supervisor.</p>
	Step 7.	<p>Check thread size against needle size, variety, and class.</p> <p>a. Be sure you have selected the right thread weight for the needle being used. It may be too heavy.</p>

Table 3-1. Operator Troubleshooting-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
DARNING SEWING MACHINE		
		b. If the wrong thread is being used, remove thread and rethread machine with the correct weight thread.
	Step 8.	Check that thread is left-twist thread. If thread is right-twist thread, remove thread and replace with left-twist thread. Rethread machine (para. 2-13c).
	Step 9.	Check that thread being used is not damp, old, or dried out. Discard damp, old, or dried out thread. Rethread machine with fresh, dry, smooth, left-twist thread of the correct weight (para. 2-13c).
27.	BOBBIN THREAD BREAKS.	
	Step 1.	Check that bobbin case is threaded correctly and installed correctly. Thread and install bobbin case correctly (paras. 2-13d through 2-13h).
	Step 2.	Check bobbin to see that it is not so full of thread as to keep it from revolving freely in the bobbin case. Remove excess thread until rounds of thread are even with the rim of the bobbin (para. 2-13e).
	Step 3.	Check that rounds of thread on bobbin are not lapped over one another and check that rounds of thread are evenly wound across the bobbin (no ridges or valleys in the rounds). Use a correctly wound bobbin, or remove thread and rewind bobbin correctly with proper thread (paras. 2-13d through 2-13h.).
	Step 4.	Check that bobbin case tension is not too tight. Adjust bobbin case for correct tension (para. 2-13k).
	Step 5.	Check that bobbin case is not sticky with oil and lint. If bobbin case is sticky, notify your supervisor.

Table 3-1. Operator Troubleshooting-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
	Step 6.	Check for rough, sharp, or burred edges on rotary-sewing hook, bobbin, and bobbin case. If defects are found, notify your supervisor.
	Step 7.	Check that thread being used is not damp, old, or dried out. Discard damp, old, or dried out thread. Rewind bobbin with fresh, dry, smooth thread of the correct weight (paras. 2-13d through 2-13h).

28. STITCHES SKIP OR FAIL TO LOCK.

NOTE

The most common cause of fail-to-lock or skipped stitches, is using the wrong needle for the fabric being mended. Always use the correct size, class, and variety needle recommended for the fabric being worked.

- Step 1. Check that needle size, class, and variety is right for the fabric in work.

If needle is incorrect, replace needle with new needle of correct size, class, and variety (paras. 2-13a and 2-13b).
- Step 2. There may not be enough pressure on the presser foot for the fabric being worked.

Vary pressure of presser foot using pressure regulator to try and correct trouble.
- Step 3. Check that needle is not blunted or bent.

If blunted or bent, replace needle with a new needle of correct size, class, and variety (paras. 2-13a and 2-13b).

NOTE

Even if you see nothing wrong with the needle, it may have accumulated lint or sizing from the fabric. This can happen with certain synthetics and permanent press fabrics or in stitching through adhesives. Clean the needle or change it if this problem is suspected.

Table 3-1. Operator Troubleshooting-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
DARNING SEWING MACHINE		
Step 4.	Needle bar is out of adjustment.	Notify your supervisor.
29.	SEAMS DRAW.	Needle thread or bobbin thread tension too tight. Adjust needle thread and bobbin thread to correct tension (para. 2-13k).
30.	THREAD SNARLS AT BEGINNING OF DARN.	<p style="text-align: center;">NOTE</p> <p><i>Snarls at the start of a mend can usually be prevented by manually placing needle into fabric before lowering pressure foot. Be sure you have both needle and bobbin threads under the presser foot and drawn to the rear. Hold both thread ends for the first few stitches.</i></p> <p>Thread and/or fabric are probably pulled down into the bobbin area.</p> <p>a. To release snarl, turn handwheel back and forth a few times to loosen the caught material. Remove the material and snarled thread and observe the note above before resuming work.</p> <p>b. Check that machine is threaded correctly. Rethread machine if necessary (para. 2-13c).</p>
31.	THREAD SNARLS DURING DARNING,	<p>Step 1. Lint from the bobbin area may be caught in the stitching. Clean bobbin area of lint.</p> <p>Step 2. Bobbin thread may be running out. Replace with a fully wound bobbin (paras. 2-13d through 2-13h).</p> <p>Step 3. Needle thread or bobbin thread tensions may be incorrect.</p>

Table 3-1. Operator Troubleshooting-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
DARNING SEWING MACHINE		
Adjust needle thread and bobbin thread to correct tension (para. 2-13k).		
Step 4.		Machine timing may be off. Notify your supervisor.
32.	THREAD SNARLS AT END OF DARN.	
NOTE		
<i>As a general rule, it is not a good practice to mend off the fabric. This can cause thread knotting in the bobbin area and snarls at the end of the mend.</i>		
Step 1.		Fabric and thread are being pushed into the bobbin area causing knots.
Turn the handwheel back and forth a few times to loosen snarl; then remove snarl.		
Step 2.		Check all machine adjustments and readjust as necessary.
If trouble still persists, notify your supervisor.		
33.	BOBBIN THREAD CANNOT BE RAISED THROUGH HIOLE IN LATCH PLATE.	
Step 1.		Check bobbin case threading.
Rethread bobbin case (para. 2-13f).		
Step 2.		Check that bobbin case is seated in rotary-sewing hook correctly.
Seat bobbin case correctly (para. 2-13g).		
34.	PRESSER FOOT PRESSURE REGULATOR THUMBSCREW IS HARD TO ADJUST.	
Presser foot may have been lowered before change was made in the pressure setting.		

Table 3-1. Operator Troubleshooting - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
DARNING SEWING MACHINE		
		<ul style="list-style-type: none"> a. Raise presser foot with hand lifter. Decrease pressure on presser foot by turning the pressure adjusting thumbscrew to the left. Lower presser foot and adjust presser foot to the desired pressure for the fabric being worked. b. If presser foot pressure cannot be increased or decreased, notify your supervisor.
35. MACHINE VIBRATES.		<p>Step 1. Check that machine-to-table mounting screws are tight and check that table is on a flat hard surface.</p> <ul style="list-style-type: none"> a. If mounting screws are loose, notify your supervisor. b. Relocate table to flat, hard surface, if necessary. <p>Step 2. Machine motor drive belt is probably too tight. Notify next higher level of maintenance.</p> <p>Step 3. Machine drive pulley or balance wheel out-of-balance, loose, or installed wrong.</p> <p style="padding-left: 40px;">Notify your supervisor.</p>
36. LAMP DOES NOT LIGHT.		<p>Step 1. Check lamp on-off switch.</p> <p style="padding-left: 40px;">Set lamp on-off switch to the on position.</p> <p>Step 2. Check that lamp light cord is plugged into input power outlet.</p> <p style="padding-left: 40px;">Plug in light cord into power outlet, if necessary.</p> <p>Step 3. Check that light bulb is not broken, burned out, or missing.</p> <ul style="list-style-type: none"> a. If light bulb is burned out or missing, notify your supervisor b. If light bulb is broken, notify your supervisor. <p>Step 4. Unplug light cord from outlet and check cord and plug for frayed or broken insulation and wire.</p>

Table 3-1. Operator Troubleshooting - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
DARNING SEWING MACHINE		
		If defective insulation, wiring or plug is found, notify next higher level of maintenance.
	Step 5. Lamp assembly or lamp ON-Off switch may be defective.	Notify your supervisor.
	Step 6. Electrical power outlet receptacle may be defective.	Notify your supervisor.
37.	MOTOR DOES NOT START.	
	Step 1. Check to see if motor to sewing machine drive belt is loose, slipping, frayed, or deteriorated.	Turn off motor and notify your supervisor.
	Step 2. Input voltage to motor may be low or motor may be faulty.	Turn off motor and notify your supervisor.
	Step 3. Motor on-off switch may be defective.	Notify your supervisor.
	Step 4. Motor may be defective.	Notify your supervisor.
38.	UNUSUAL NOISE IN MOTOR.	
	Motor may be defective.	Turn off motor and notify your supervisor.
39.	MOTOR DOES NOT PULL LOAD.	
	Step 1. Check to see if motor to sewing machine drive belt is loose, slipping, frayed, or deteriorated.	Turn off motor and notify your supervisor.

Table 3-1. Operator Troubleshooting - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
DARNING SEWING MACHINE		
Step 2. Input voltage to motor may be low or motor may be faulty.		
Turn off motor and notify your supervisor.		
BUTTON SEWING MACHINE		
40. NEEDLE BREAKS.		
Step 1. Needle may have been wrong size, class, and variety. Check needle size.		
Replace broken needle with new needle of correct size, class, and variety (paras. 2-14a and 2-14b).		
Step 2. Needle may have become bent or has a blunt point.		
Replace broken needle with new needle of correct size, class, and variety (paras. 2-14a and 2-14b).		
Step 3. Button was not alined firmly and correctly in button clamp.		
a. Replace broken needle with new needle of correct size, class and variety (paras. 2-14a and 2-14b).		
b. Aline button firmly and correctly in button clamp (paras. 2-14e and 2-14f).		
Step 4. Make sure you are not stepping on motor starting treadle before lowering button clamp on material firmly with button clamp treadle.		
Be sure button clamp is firmly down on material before starting machine with motor starting treadle.		
Step 5. You may be raising the button clamp before machine stops.		
a. Replace broken needle with new needle of correct size, class and variety (paras. 2-14a and 2-14b).		
b. Do not raise button clamp with foot treadle until machine stops.		
Step 6. Two-hole or four-hole regulator is not set to correspond with number of holes in button.		

Table 3-1. Operator Troubleshooting - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
BUTTON SEWING MACHINE		
	a.	Replace broken needle with new needle of correct size, class and variety (paras. 2-14a and 2-14b).
	b.	Set two-hole or four-hole regulator to the position corresponding to the number of holes in the button. Lock button clamp in position with thumbscrew (para. 2-14f).
Step 7.	Button clamp is out of adjustment.	Notify your supervisor.
Step 8.	Needle bar vibration does not coincide with distance between button holes.	Notify your supervisor.
Step 9.	Looper is out of adjustment.	Notify your supervisor.
41.	THREAD BREAKS.	
Step 1.	Check that machine is threaded correctly.	Rethread machine in accordance with para. 2-14c.
Step 2.	Check needle size, class, and variety.	Install new needle of correct size, class, and variety (paras. 2-14a and 2-14b).
Step 3.	Check needle point.	Install new needle of correct size, class, and variety if needle point is blunt, burred, or broken (paras. 2-14a and 2-14b).
Step 4.	Check thread tension.	Adjust thread tension if tension is too tight or too loose (para. 2-14d).
Step 5.	Check quality and condition of thread.	Replace thread if damp or defective.

Table 3-1. Operator Troubleshooting - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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BUTTON SEWING MACHINE

Step 6. Check twist of thread.

Thread must be left-twist thread. Replace thread if right-twist thread is being used.

Step 7. Check thread size.

Use correct size thread.

Step 8. Check looper.

If looper has rough edges or point is bent, notify your supervisor.

Step 9. Rear thread tension disks out of adjustment.

Do not attempt to adjust rear thread tension disks, notify your supervisor.

42. LAMP DOES NOT LIGHT.

Step 1. Check lamp on-off switch.

Set lamp on-off switch to the on position.

Step 2. Check that lamp light cord is plugged into input power outlet.

Plug in light cord into power outlet.

Step 3. Check that light bulb is not broken, burned out, or missing.

a. If light bulb is burned out or missing, notify your supervisor.

b. If light bulb is broken, notify your supervisor.

Step 4. Unplug light cord from outlet and check cord and plug for frayed or broken insulation and wires.

If defective insulation, wiring, or plug is found, notify next higher level of maintenance.

Step 5. Lamp assembly or lamp on-off switch may be defective.

Notify your supervisor.

Table 3-1. Operator Troubleshooting - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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BUTTON SEWING MACHINE

Step 6. Electrical power outlet receptacle may be defective.

Notify your supervisor.

43. MOTOR DOES NOT START.

Step 1. Check motor on-off switch.

Set motor on-off switch to the on position.

Step 2. Check that motor power cable is plugged into input power outlet.

Plug power cable into input power outlet, if necessary.

Step 3. Motor on-off switch may be defective.

Notify your supervisor.

Step 4. Motor may be defective.

Notify your supervisor.

44. UNUSUAL NOISE IN MOTOR.

Motor may be defective.

Turn off motor and notify your supervisor.

45. MOTOR DOES NOT PULL LOAD.

Step 1. Check to see if motor to sewing machine drive belt is loose, slipping, frayed, or deteriorated.

Turn off motor and notify your supervisor.

Step 2. Input voltage to motor may be low or motor may be faulty.

Turn off motor and notify your supervisor.

Table 3-1. Operator Troubleshooting - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

GROMMET PRESS

46. HANDLEVER STICKS ON DOWNSTROKE.

Check frame and handlever pivot for dirt or other obstruction.

Clean inside of frame and pivot.

47. FASTENERS ARE LOOSE.

Step 1. Be sure you are using enough downward hand pressure on lever.

Apply hand pressure on lever more firmly.

Step 2. Check that snap fastener parts are inserted properly.

Insert snap fastener parts properly in chucks and dies (para. 2-15d).

48. MACHINE CUTS MATERIAL.

Pressure is too great on hand lever.

Decrease pressure on hand lever.

TACK-BUTTON ATTACHING MACHINE

49. HANDLEVER STICKS ON DOWNSTROKE.

Check frame and handlever pivot for dirt or other obstruction.

Clean inside frame and pivot.

50. UPPER DIE DOES NOT HOLD BUTTON FIRMLY.

Inspect upper die wires.

If upper die wires are loose or broken, notify next higher level of maintenance.

51. DOUBLE-PRONGED TACK DOES NOT FIT PROPERLY INTO HOLES IN BUTTON.

Check that tack is properly installed in lower die.

Install tack in lower die properly.

Table 3-1. Operator Troubleshooting - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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TACK-BUTTON ATTACHING MACHINE

52. MACHINE CUTS MATERIAL.

Check pinch adjustment.

Pinch adjusted too tight. Adjust pinch properly (para. 2-16b).

53. SHANK OF LOWER DIE BINDS.

Pin on lower die is interfering with spring.

Notify next higher level of maintenance.

SECTION III. OPERATOR MAINTENANCE PROCEDURES

Belt Adjustment.....	Para. 3-8	General	Para. 3-7
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3-7. GENERAL.

This section contains information on the adjustment of the various items that are maintainable at the Crew/Operator Level.

3-8. BELT ADJUSTMENT.

This task covers: a. Belt Tightening b. Belt Loosening

INITIAL SET-UP

Applicable Configuration

None

Test Equipment

None

Special Tools

None

Material/Parts

None

Personnel Required

1 Person

Equipment Condition

<u>Para.</u>	<u>Condition Description</u>
2-9	Sewing Tables Set-Up and Machines Installed.

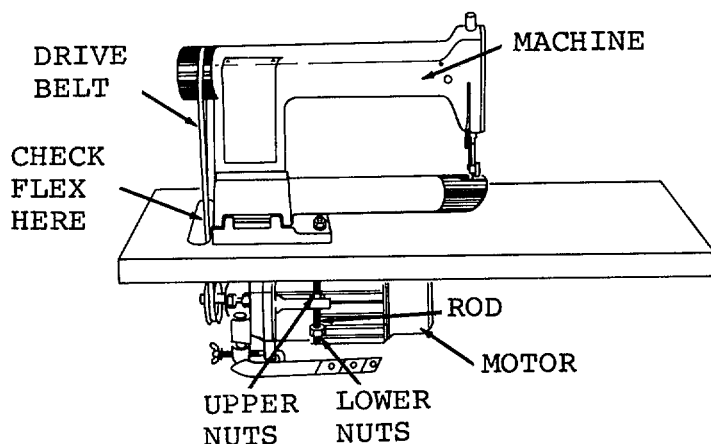
Special Environmental Conditions

None

General Safety Instructions

Be sure power switch is set to OFF.

a. *Belt Tightening (Refer to Figure 3-1).*



- (1) Loosen lower nut.
- (2) Turn upper nut counterclockwise to tighten belt.
- (3) Tighten upper bolt until belt flex is 1/2 inch (1.27 cm) at center of bolt.
- (4) Tighten lower nut.

Figure 3-1. Typical Belt Adjustment.

b. *Belt Loosening (Refer to Figure 3-1).*

- (1) Loosen upper nut clockwise until belt flex is 1/2 inch (1.27 cm) at center of belt.
- (2) Tighten lower nut.

CHAPTER 4
MAINTENANCE OF AUXILIARY EQUIPMENT

	Para.		Para.
General.....	4-1	Fire Extinguisher	4-2

4- 1. GENERAL.

This chapter contains the necessary instructions, descriptions, and references for operating the auxiliary materiel or components used in conjunction with the clothing repair shop. The auxiliary components include a fire extinguisher and a generator set. The necessary instructions for the operation and the maintenance of the fire extinguisher is given in paragraph 4-2. Refer to the TM 5-6115-271-14 for the operation and maintenance of the generator set and to TM 9-2330-213-14 for operation and maintenance of the cargo trailer.

4-2. FIRE EXTINGUISHER.

A 5-pound carbon dioxide (CO²) fire extinguisher is issued with the clothing repair shop.

a. *Operation.* Operate the fire extinguisher by following the procedures in the order in which they are listed below.

1. Carry the fire extinguisher by the handle to the fire.
2. Pull out the safety pin, breaking the wire seal, and swing the horn toward the base of the fire.

WARNING

Do not let eyes, hands, or body come directly in contact with the fog, as frostbite or freezing may result.

3. Depress the operating lever to open the valve, and direct the discharge or fog toward the base of the fire.

b. *Maintenance.* Inspect the fire extinguisher for broken wire seal. Recharge the fire extinguisher immediately after it has been used or if the loss of gas exceeds one-half of a pound. The weight of the fire extinguisher is stamped on the valve.

CHAPTER 5

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I.	REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT
Section II.	SERVICE UPON RECEIPT
Section III.	ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)
Section IV.	ORGANIZATIONAL TROUBLESHOOTING
Section V.	MAINTENANCE OF CABINET ASSEMBLY
Section VI.	MAINTENANCE OF SEWING MACHINE TABLES
Section VII.	MAINTENANCE OF GROMMET PRESS
Section VIII.	MAINTENANCE OF TACK-BUTTON ATTACHING MACHINE
Section IX.	PREPARATION FOR STORAGE OR SHIPMENT

SECTION I. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

	Para.		Para.
Common Tools and Equipment	5-1	Special Tools, TMDE, and	
Repair Parts	4-1	Support Equipment	5-2

5-1. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

5-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

No special tools, TMDE, or support equipment is authorized for the maintenance of the clothing repair shop.

5-3. REPAIR PARTS.

Repair parts are listed and illustrated in the repair parts and special tools list TM 10-3530-205-24P covering organizational, direct support and general support, and depot maintenance for this equipment.

SECTION II. SERVICE UPON RECEIPT

	Para.		Para.
Service Upon Receipt of a Complete Clothing Repair Shop.....	5-5	Service Upon Receipt of New or Replacement Equipment	5-4

5-4. SERVICE UPON RECEIPT OF NEW OR REPLACEMENT EQUIPMENT.

When new or replacement items of equipment are received by the using organization, they must be unpacked and inspected before they are fielded as part of the clothing repair shop. The services performed are the responsibility of organizational personnel as described below:

a. Unpacking New or Replacement Equipment.



Use caution when unpacking the equipment from the original shipping containers. The use of screwdrivers and prybars to open shipping containers can cause damage to equipment if not used properly. Observe all precautions noted on the shipping tag.

- (1) Remove and discard all tape and materials used in packing the equipment.
- (2) Remove and discard any desiccant packages that may have been used in the packaging.
- (3) Remove any preservative compounds that may have been sprayed on metal surfaces prior to packaging. Because these compounds are not lubricants, take special care to remove them from all wearing surfaces.

b. Checking Unpacked New Equipment or Replacement Equipment. Check unpacked items of equipment as follows:

- (1) Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6, Packaging Improvement Report.
- (2) Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions contained in DA PAM 738-750.

5-4. SERVICE UPON RECEIPT OF NEW OR REPLACEMENT EQUIPMENT - Continued.*b. Checking Unpacked New Equipment or Replacement Equipment - Continued.*

- (3) Check to see whether the equipment has been modified. If equipment has been modified, check equipment decals to insure that the Modification Work Order has been completed and dated.

5-5. SERVICE UPON RECEIPT OF COMPLETE CLOTHING REPAIR SHOP.

When either a new or used clothing repair shop is received by an organization, the organizational personnel must inspect and service each component to prepare it for operation. The operator will assist the organizational personnel when he is directed to do so.

a. Unpacking and Unloading of Equipment From Cabinet Assembly.

Use caution when unpacking the equipment from the original shipping containers. The use of screwdrivers and prybars to open shipping containers can cause damage to equipment if not used properly. Observe all precautions noted on the shipping tag.

- (1) Remove the equipment from the cabinet assembly and set it up in accordance with the instructions contained in Chapter 2, Section I of this manual.
- (2) Remove and discard all protective tape and packing material.
- (3) As the cabinet assembly is unloaded, check the equipment against the Components of End Item List (COEIL), contained in Appendix C of this manual to ensure that all items of the clothing repair shop are accounted for.

b. Inspection and Servicing of Unpacked Equipment.

- (1) Carry out a complete visual inspection of the clothing repair shop equipment, taking special notice of any damaged or missing parts which might have been sustained in transit. Read any warnings on the shipping tag to determine the condition in which the clothing repair shop was shipped. Observe all precautions noted on the shipping tag.
- (2) Perform the quarterly preventive maintenance checks and services (PMCS) described in Section III of this chapter.

5-5. SERVICE UPON RECEIPT OF COMPLETE CLOTHING EQUIPMENT - Continued.*b. Inspection and Servicing of Unpacked Equipment - Continued.*

- (3) Perform the lubrication services contained in Chapter 3, Section I of this manual.
- (4) Perform PMCS and lubrication services for the generator set as described in TM 5-6115-271-14.
- (5) Perform the PMCS and lubrication services for the cargo trailer as described in TM 9-2330-213-14.

NOTE

The services performed at this time will begin the cycle of regularly scheduled quarterly preventive maintenance services.

SECTION III. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)**5-6. GENERAL.**

a. To obtain long life and best performance from the equipment of the clothing repair shop, you must adhere to the preventive maintenance checks and services contained in this section. The required PMCS to be performed quarterly by organizational maintenance personnel is listed and described in Tables 5-1 through 5-6.

5-7. ORGANIZATIONAL PMCS PROCEDURES.

- a. The item numbers of the tables indicate the sequence of the PMCS.
- b. If something doesn't work, troubleshoot it with the instructions in this manual or notify your supervisor.
- c. Always do your preventive maintenance in the same order, so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.
- d. If anything looks wrong and you can't fix it, write it down on your DA Form 2404. If you find something seriously wrong, report it to direct support as soon as possible.
- e. When you do your preventive maintenance, take along the tools and equipment, you'll need to make all the checks. You always need a rag or two.

5-7. ORGANIZATIONAL PMCS PROCEDURES - Continued.**WARNING**

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (1) Keep it clean: Dirt, grease, oil, and debris may cover up a serious problem. Clean as you work and as needed. Use cleaning solvent (Federal Specification P-D-680) to clean metal surfaces. Use soap and water when you clean cloth, rubber, painted surfaces, or plastic material.
- (2) Bolts, nuts, and screws: Check that they are not loose, missing, bent, or broken. Look for chipped paint, bare metal, or rust around bolt heads. Tighten any that you find loose.
- (3) Welds: Look for cracked or broken welds and cracks in parent metal. If you find a bad weld, report it to direct support.
- (4) Electric wires and connections: Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connections and report defective wiring to Direct Support Maintenance.

f. Item Number Column. This column not only indicates the sequence of performing the PMCS, but is also used as a source of item numbers for the TM Number Column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording results.

g. Item to be Inspected Column. This column identifies the item to be inspected by its common name.

h. Procedure Column. This column contains the procedures and methods required to perform the PMCS.

Table 5-1. Organizational Quarterly Preventive Maintenance Checks and Services, Cabinet Assembly

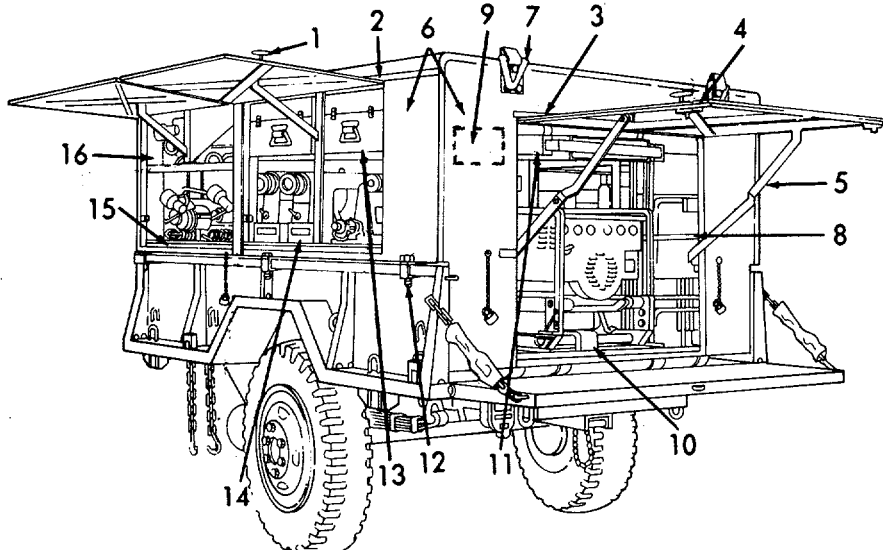
ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
1	Folding handle locks	 <p>Inspect for bent, broken, or loose folding handles and for loose or missing nuts and screws. Notify next higher level of maintenance if any of these conditions exist.</p> <p>Check operation of the handles to see that they lock and unlock the doors and fold into the lock wells. Notify the next higher level of maintenance if the handles fail to function.</p>
2	Cabinet assembly framework	<p>Inspect overall cabinet framework for cracked, broken, or bent stiffeners. Inspect for broken welds on stiffeners and check for loose rivets attaching sheet metal to stiffeners. Notify the next higher level of maintenance if any of these conditions exist.</p>

Table 5-1. Organizational Quarterly Preventive Maintenance Checks and Services, Cabinet Assembly - Continued

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
3	Doors and hinges	<p>Inspect the rear and side door for broken welds, dented surfaces, or deteriorated gasket. Notify next higher level of maintenance if any of these conditions exist.</p> <p>Inspect the hinges for loose or missing rivets and make certain doors will open and close without binding. If parts are loose, missing, or damaged, or if doors bind, notify next higher level of maintenance.</p>
4	Door and panel latches	<p>Inspect for bent or broken door and panel latches. Check the latches for binding, broken welds, loose mounting, and improper alignment of door latches. Notify next higher level of maintenance if any of these conditions exist.</p>
5	Door stays	<p>Inspect for bent or broken rear and side door stays. Be sure the stays will lock and hold the door in the open position. If stay is damaged or door will not lock open, notify next higher level of maintenance.</p>
6	Panels	<p>Inspect panels and exterior of cabinet for dirt. Clean dirty surfaces with mild soap and water.</p> <p>Check for cut, broken, or dented surfaces. Check for broken welds, loose or missing rivets and loose mountings. Notify next higher level of maintenance if any of these conditions exist.</p>
7	Lifting loops	<p>Inspect for loose, bent, cracked, or damaged loops. Check for there are no missing spring clips, retainers, or screws and nuts. Refer to paragraph 5-12 for replacement of defective parts.</p> <p>Inspect for loose or missing rivets, binding, and-loose mounting. Refer to paragraph 5-12 for replacement of defective parts.</p>

Table 5-1. Organizational Quarterly Preventive Maintenance Checks and Services, Cabinet Assembly - Continued

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
8	Chair holddown straps	Inspect chair holddown assemblies for cracked, broken, loose, or missing footman loops. Check that strap webbing does not show signs of cuts, tears, or excessive fraying. Check for loose or broken buckles and for loose mounting. Refer to paragraph 5-11 for replacement of defective parts.
9	Fire extinguisher	<p>Check that handle and trigger assembly is not damaged and that nozzle is not bent or broken. Refer to paragraph 4-2 for fire extinguisher maintenance.</p> <p>Inspect fire extinguisher mounting bracket for bent or broken frame. Check that locking latch operates properly and that bracket is securely mounted to cabinet frame. Notify next higher level of maintenance if any of these conditions exist.</p>
10	Generator holddown assembly	Check for cracked, bent, or broken tracks, stops, and holddowns. Check for broken welds and loose mounting of holddown assembly to floor. Check for missing cotter pins and stud bolts. Notify next higher level of maintenance for defective parts.
11	Folding table slides	Check slides for broken welds and for torn, badly worn, loose, or missing felt. Notify next higher level of maintenance if any of these conditions exist.
12	Cabinet holddown clamp assembly	Check that no holddown clamps are missing. Check that clamps are not broken or threads are not stripped on knurled clamp screws or clamping bracket. Check that holddown clamp assemblies are tight, and securely clamp the cabinet assembly to the trailer. Notify next higher level of maintenance if any of these conditions exist.

Table 5-1. Organizational Quarterly Preventive Maintenance Checks and Services, Cabinet Assembly - Continued

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
13	Storage boxes	Inspect for dirty, cut, dented, and broken surfaces. Check for loose or missing rivets and for bent, broken, or loose handles, hooks, latches, and hinges. Make certain the hooks and latches will lock and unlock, and hinges operate without binding. Refer to paragraph 5-17 for replacement of damaged parts.
14	Sewing machine tray assemblies	Inspect the tray assemblies for any cracks longer than 2 inches extending through the full thickness of the wood or any cracks in the holddown areas. Check for bent or broken holddown traps and tray pulls. Check for broken, loose, or missing tray stops and strikers. Check for missing or loose screws throughout. Check for stripped threads on thumbscrews and mating nut on holddown strap. Check for mechanical binding of holddown strap hinges and make sure strap hinge mounting screws are tight and none are missing. Check that felt shock absorbers on holddown straps are not worn or missing, and that rubber on bumpers are not deteriorated or badly worn. Refer to paragraphs 5-14 through 5-16 for replacement of damaged parts.
15	Sewing machine folding stand container	Inspect the sewing machine folding stand holddown strap assemblies for cracked, broken, loose, or missing footman loops; for missing, loose, or damaged screws; for cut, torn, or frayed webbing straps; for loose or damaged strap buckles, and for loose mounting. Refer to paragraph 5-11 for replacement of damaged parts.
16	Machine table slides	Inspect the sewing machine table assemble slides for broken welds, and excessively worn, torn, loose, or missing felt pads. Notify next higher level of maintenance if any of these conditions exist.

Table 5-2. Organizational Quarterly Preventive Maintenance Checks and Services, Clothing Sewing Machine

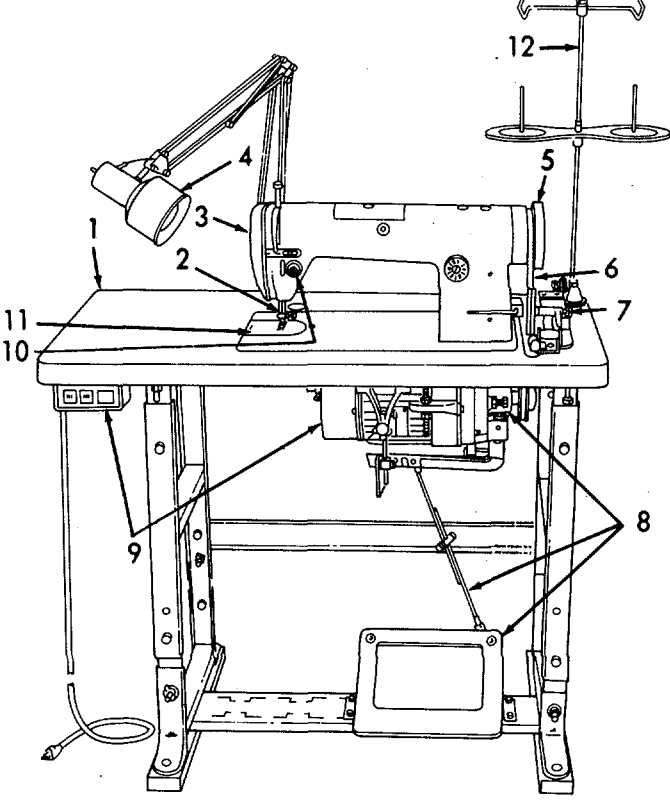
ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
1	Table assembly	 <p>Inspect table for cut, cracked, broken, warped, or dirty tabletop; for loose or missing bolts and nuts, and for loose mounting to the folding stand. Clean a dirty table top with mild soap and water. Refer to paragraph 5-19 for replacement or repair of damaged parts.</p>
2	Needle, thread guide and clamp	<p>Inspect needle for broken or worn point and for bent or broken shaft. Make certain needle is installed properly. Inspect for broken, bent, or improperly installed thread guide and clamp. Refer to paragraph 2-12 for needle replacement. Notify the next higher level of maintenance if any of the other conditions exist.</p>

Table 5-2. Organizational Quarterly Preventive Maintenance Checks and Services, Clothing Sewing Machine - Continued

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
3	Faceplate assembly	Inspect presser foot for improper alignment and loose mounting. Inspect spring for broken coil and incorrect tension. Inspect needle bar for improper alignment. Check takeup lever for excessive play. Make certain the presser bar lifter has a 1-inch play before meeting resistance. Notify the next higher level of maintenance if any of the above conditions exist.
4	Lamp assembly	Inspect lamp assembly and bracket for loose or missing bolts, nuts, and screws. Inspect electrical cord for frayed insulation and broken wiring. Inspect for broken lamp switch and for broken or-burned out bulb. Replace a defective bulb. Notify next higher level of maintenance if any other of the above conditions exist.
5	Machine pulley wheel	Inspect machine pulley wheel for loose mounting to the arm shaft. Turn the pulley toward the front of machine and check the wheel for mechanical binding. Notify next higher level of maintenance if any of the above conditions exist.
6	Drive belt and pulleys	Inspect for broken, frayed, and excessively worn drive belt. Inspect belt for loose mounting on the pulleys. Inspect pulleys for cracked, chipped, or broken edges. Replace a defective belt. Refer to Appendix F for belt fabrication procedure. Notify next higher level of maintenance if any of the other conditions exist.
7	Bobbin winder	Inspect bobbin winder for bent, broken, loose, or missing components. Inspect for excessively worn leather brake, for incorrect tension of thread tension spring, and for improper tension of the pulley with the drive belt. Replace a damaged bobbin winder. Adjust bobbin winder (para. 2-12a) if out of adjustment. If drive belt is too loose or too tight, adjust belt (para. 3-8).

Table 5-2. Organizational Quarterly Preventive Maintenance Checks and Services, Clothing Sewing Machine - Continued

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
8	Motor clutch, rod and treadle	Inspect motor clutch, rod, and treadle for bent, broken, or loose components. Operate treadle and see that the clutch engages the motor drive pulley with the drive when the treadle is depressed. Make certain the pulley brake lever disengages and stops the pulley when the treadle is released. Notify next higher level of maintenance if any of the above conditions exist.
9	Electrical motor and switch	Inspect electrical motor for dirty surfaces and grease deposits; for bent, cracked, or broken housing; for loose or missing bolts; for loose electrical connections; for frayed insulation and broken wiring; for loose mounting. Inspect for broken motor switch. Inspect for loose mounting in the switchbox. Clean a dirty motor and switch by wiping with a clean, soft cloth (Appendix E, item 3). Tighten loose mounting hardware. Notify the next higher level of maintenance if any of the other above conditions exist.
10	Thread tension stud, thumb nut, and thread control spring	Inspect thread control spring for broken, bent, or corroded coils and incorrect tension. Inspect thread tension and stud and thumb nut for stripped threads, and make certain thumb nut turns on stud. Notify next higher level of maintenance if any of these conditions exist.
11	Throat plate and feed dog	Inspect for broken, bent, and improperly installed throat plate. Inspect plate for nicked or corroded surface. Inspect feed dog for excessively worn or broken teeth. Make certain teeth show their full length above the throat plate. Notify next higher level of maintenance if any of these conditions exist.
12	Thread unwinder	Inspect for loose or missing bolts, nuts, and screws; bent or broken components and for loose mounting. Replace defective parts (para. 5-19).

Table 5-3. Organizational Quarterly Preventive Maintenance Checks and Services, Darning Sewing Machine

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
1	Table assembly	Inspect table for cut, cracked, broken, warped, or dirty tabletop; for loose or missing bolts and nuts, and for loose mounting to the folding stand. Clean a dirty tabletop with mild soap and water. Refer to paragraph 5-19 for replacement or repair of damaged parts.
2	Lamp assembly	Inspect lamp assembly and bracket for loose or missing bolts, nuts, and screws. Inspect electrical cord for frayed insulation and broken wiring. Inspect for broken bulb switch and for broken or burned out lamp. Replace a defective bulb. Notify next higher level of maintenance if any of the other above conditions exist.

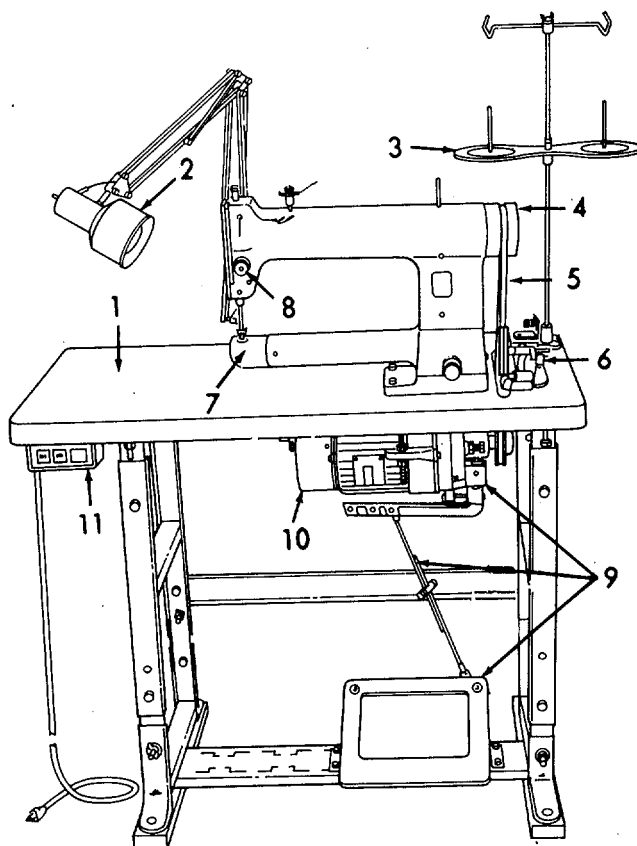


Table 5-3. Organizational Quarterly Preventive Maintenance Checks and Services, Darning Sewing Machine - Continued

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
3	Thread unwinder	Inspect thread unwinder for loose or missing bolts, nuts, and screws; for bent or broken components, and for loose mounting. Replace defective parts (para. 5-19).
4	Machine pulley wheel	Inspect machine pulley wheel for loose mounting. Turn machine pulley wheel toward front of machine and check the wheel for mechanical binding. Notify next higher level of maintenance if any of the above conditions exist.
5	Drive belt and pulleys	Inspect for broken, frayed, and excessively worn drive belt. Inspect belt for loose mounting on the pulleys. Inspect pulleys for cracked, chipped, or broken edges. Check for a 1/2 inch deflection of belt midway between pulleys. Notify next higher maintenance level if any of the other conditions exist.
6	Bobbin winder	Inspect bobbin winder for bent, broken, loose or missing components. Inspect for excessively worn leather brake, for incorrect tension of thread tension spring, and for improper tension of the pulley with the drive belt. Replace a damaged bobbin winder. Adjust bobbin winder (para. 2-12a) if out of adjustment. If drive belt tension is improper, adjust belt (para. 3-8).
7	Latch cover	Inspect latch cover for cracked, bent, or rough surface. Notify next higher level of maintenance if any of the above conditions exist.
8	Thread tension stud, thumb nut, and thread control spring	Inspect thread control spring for broken or bent coils and for incorrect tension. Inspect thread tension stud and thumb nut for stripped threads and make certain the thumb nut turns on the stud. Notify next higher level of maintenance if any of the above conditions exist.

Table 5-3. Organizational Quarterly Preventive Maintenance Checks and Services, Darning Sewing Machine - Continued

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
9	Motor clutch, rod, and treadle	Inspect motor clutch, rod, and treadle for bent, broken, or loose components. Operate treadle fully and see that the clutch fully engages the motor drive pulley with the drive motor. Make certain the pulley brake lever disengages and stops the drive pulley when the treadle is released. Notify next higher level of maintenance if any of the above conditions exist.
10	Electric motor	Inspect electric motor for dirty surfaces and grease deposits, for bent, cracked or broken housing; for loose or missing bolts and nuts, for loose electrical connections, for frayed insulation and broken wiring, and for loose mounting. Clean a dirty motor by wiping with a clean, soft cloth (Appendix E, item 3). Tighten loose mounting hardware. Notify next higher maintenance level if any of the above conditions exist.
11	Motor switch	Inspect for a broken motor switch. Inspect it for loose mounting in the switchbox. Check for loose electrical connections or broken wiring at the switchbox. Check the switch for improper operation. Notify next higher level of maintenance if any of the above conditions exist.

Table 5-4. Organizational Quarterly Preventive Maintenance Checks and Services, Button Sewing Machine

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
1	Table assembly	Inspect table for cut, cracked, broken, warped, or dirty tabletop; for loose or missing bolts and nuts, and for loose mounting to the folding stand. Clean a dirty tabletop with mild soap and water. Refer to paragraph 5-19 for replacement or repair of damaged parts.
2	Button machine head	Inspect button machine head for dirty surface and grease deposits, for bent, broken, loose, or missing components; and for loose mounting. Inspect needle for broken or excessively worn point and for bent or broken shaft. Refer to paragraph 2-14 to replace a defective needle. Notify the next higher level of maintenance if any of the other conditions exist.

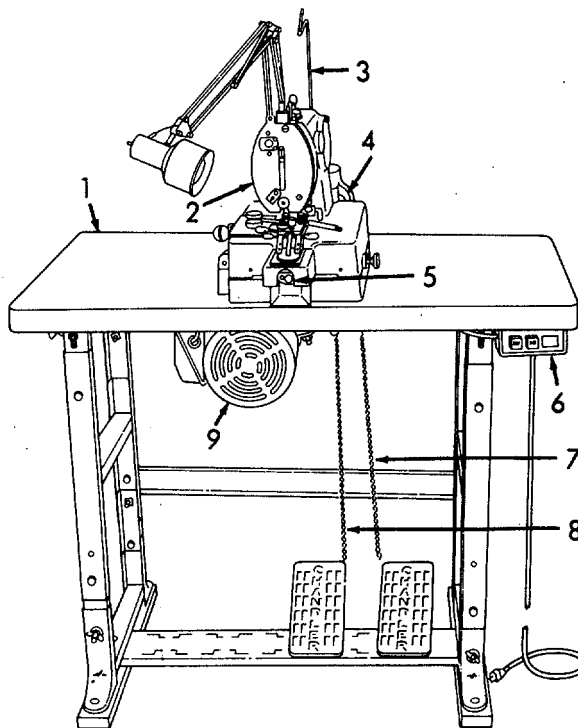


Table 5-4. Organizational Quarterly Preventive Maintenance Checks and Services, Button Sewing Machine - Continued

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
3	Thread unwinder	Inspect thread unwinder for loose or missing bolts, nuts, and screws and for bent or broken components. Notify next higher level of maintenance for replacement or repair of damaged parts.
4	Drive belt and pulley	Inspect for broken, frayed, and excessively worn drive belt. Inspect belt for loose mounting on the pulleys. Inspect pulleys for cracked, chipped, or broken edges and for loose mounting. Check for a 1/2-inch deflection of the belt midway between the pulleys. Notify next higher maintenance level if any of the other conditions exist.
5	Looper	Tilt machine head on one side and inspect for broken looper point. Inspect looper, needle guide, and thread finger for improper adjustment. Notify next higher level of maintenance if any of the above conditions exist.
6	Motor switch	Inspect for broken switch. Inspect it for loose mounting in the switchbox and make certain it turns the motor on and off. Check for loose electrical connections or broken wiring at switchbox. Notify next higher level of maintenance if any of the above conditions exist.
7	Starting treadle chain	Inspect starting treadle chain for bent or broken links and loose mounting to the pulley shifter or the starting treadle. Press treadle and make certain pulley shifter engages with the machine drive pulley. Notify next higher maintenance level if any of the above conditions exist.
8	Button clamp lifter treadle chain button clamp.	Inspect button clamp lifter treadle chain for bent or broken links and loose mounting to button clamp lifting rod and to button clamp lifter treadle. Press the treadle and make certain lifting rod raises and lowers the

Table 5-4. Organizational Quarterly Preventive Maintenance Checks and Services, Button Sewing Machine - Continued

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
9	Electric motor	Inspect motor for dirty surfaces and grease deposits, for bent, cracked, or broken housing; for loose or missing bolts and nuts, for loose electrical connections, for frayed insulation and broken wiring, for improper and for loose mounting. Notify next higher maintenance level if any other of the above conditions exist. Clean a dirty motor by wiping with a clean, soft cloth (Appendix E, item 3). Tighten loose mounting hardware.

Table 5-5. Organizational Quarterly Preventive Maintenance Checks and Services, Grommet Press

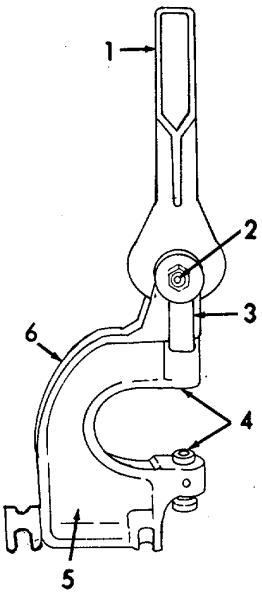
ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
1	Hand Lever	 <p>Inspect for cracked or broken hand lever. Inspect the lever for loose mounting and mechanical binding. Replace the grommet press if any of the above conditions exist.</p>
2	Pivot pin	<p>Inspect for bent, broken, loose, or missing pivot pin. Replace the grommet press if any of the above conditions exist.</p>

Table 5-5. Organizational Quarterly Preventive Maintenance Checks and Services, Grommet Press - Continued

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
3	Plunger	Inspect plunger for burred, nicked, or corroded surfaces; for mechanical binding, and for loose mounting. Replace the grommet press if any of the above conditions exist.
4	Upper and lower dies	Inspect the chucks and dies for dirty, nicked, burred, or corroded surfaces and for loose mounting. Make certain the chucks and dies will fit into the position without mechanical binding. Clean a dirty die (para. 5-23). Replace any defective die.
5	Frame	Inspect for cracked or broken frame. Inspect for dirty surfaces, for loose or missing nuts and screws, and for loose mounting to the table. Clean a dirty grommet press (para. 5-23). Replace the grommet press if any of the other above conditions exist.
6	Plunger return spring	Inspect the plunger return spring for bent or return broken coils and for loose mounting. Replace spring the grommet press if any of the above conditions exist.

Table 5-6. Organizational Quarterly Preventive Maintenance Checks and Services, Tack Button Attaching Machine

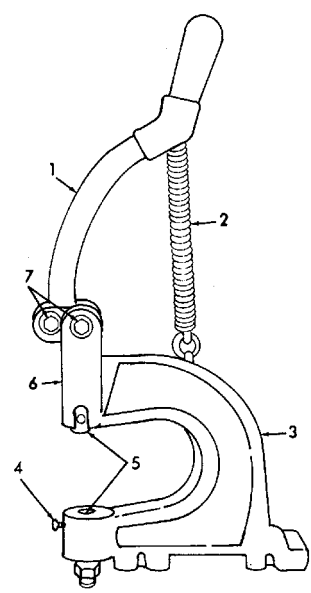
ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
		
1	Hand lever	Inspect for cracked or broken hand lever. Inspect for loose mounting and mechanical binding. Replace the tack button attaching machine if any of the above conditions exist.
2	Hand lever spring	Inspect the spring for bent or broken coils. Replace the tack button attaching machine if any of the above conditions exist.

Table 5-6. Organizational Quarterly Preventive Maintenance Checks and Services, Tack Button Attaching Machine - Continued

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURE
3	Frame	Inspect for cracked or broken frame. Inspect for dirty surfaces, for loose or missing nuts and screws, and for loose mounting to the table. Clean a dirty tack button attaching machine (para. 5-25). Replace the tack button attaching machine if any of the other above conditions exist.
4	Wing screws	Inspect for cracked or broken wing screws. Inspect for stripped threads. Replace the tack button attaching machine if any of the above conditions exist.
5	Dies	Inspect the dies for dirty, nicked, burred, or corroded surfaces, and for bent or broken shafts and springs. Make certain the dies will fit into position without mechanical binding. Clean dirty dies (para. 5-25). Replace the dies if any of the above conditions exist.
6	Plunger	Inspect the plunger for burred, nicked, or corroded surfaces; for mechanical binding, and for loose mounting. Replace the tack button attaching machine if any of the above conditions exist.
7	Pins and locks	Inspect for bent, broken, burred, corroded, loose, or missing pins or lock. Inspect the locks for loose mounting on the pins. Replace the button attaching machine if any of the above conditions exist.

SECTION IV. ORGANIZATIONAL TROUBLESHOOTING

General.....	Para. 5-7	Troubleshooting Table	Para. 5-9
Symptom Index.....	5-8		

5-7. GENERAL.

a. The table in this section lists the common malfunctions which may occur during the operation or maintenance of the clothing repair shop or components. The troubleshooting should be performed in the order given in each malfunction.

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

c. To troubleshoot the generator set, refer to TM 5-6115-271-14. To troubleshoot the cargo trailer, refer to TM 9-2330-213-14.

5-8. SYMPTOM INDEX.

Cabinet	Symptom	Page
	Holddown clamp assembly loose.....	5-25
	Rear door or any side door cannot be opened	5-25
	Rear of any side door does not close securely.....	5-25
	Rear door or any side door will not stay in open position	5-26
	Sewing machine head is loose in tray.....	5-26
	Storage box does not close securely	5-26
	Sewing machine trays or table assemblies stick or slide unevenly	5-26
Clothing Sewing Machine		
	Broken needle.....	5-26
	Feed dogs strike throat plate	5-27
	Machine vibrates.....	5-27
	Lamp does not light	5-27
	Motor does not start	5-28
	Unusual noise in motor.....	5-28
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5-8. SYMPTOM INDEX - Continued.

Symptom	Page
Darning Sewing Machine	
Machine vibrates.....	5-28
Lamp does not light.....	5-29
Motor does not start	5-29
Unusual noise in motor.....	5-29
Motor does not pull load.....	5-29
Button Sewing Machine	
Lamp does not light.....	5-29
Motor does not start	5-29
Unusual noise in motor.....	5-29
Motor does not pull load	5-29

5-9. TROUBLESHOOTING TABLE.

NOTE

Before you use the troubleshooting tables, be sure you have performed all applicable operating checks and verified that a malfunction exists. When a corrective action is performed, verify that the action has corrected the malfunction. All malfunctions deferred to the next higher level of maintenance must be reported according to the instructions given in DA PAM 738-750.

Table 5-7. Organizational Troubleshooting

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
CABINET ASSEMBLY		
1. HOLDDOWN CLAMP ASSEMBLY LOOSE.	Step 1. Check for loose, missing, or damaged hardware.	Notify next higher level of maintenance if any of the above conditions exist.
	Step 2. Check for damaged trailer or cabinet assembly.	If trailer is damaged, refer to TM 9-2330-213-14.
		If cabinet assembly is damaged, notify next higher level of maintenance.
2. REAR DOOR OR ANY SIDE DOOR CANNOT BE OPENED.	Step 1. Inspect door for dirty, cut, broken, or dented surfaces; broken welds, or a bad door gasket.	<ul style="list-style-type: none"> a. Clean dirty surfaces with soap and water. b. Notify next higher level of maintenance for cut, broken, dented surfaces or welds and bad door gasket.
	Step 2. Check that handle lock is not bent, broken, loosely mounted, or missing.	Notify next higher level of maintenance if any of the above conditions exist.
	Step 3. Check that door hinge is not broken or bent.	Notify next higher level of maintenance if any of the above conditions exist.
3. REAR DOOR OR ANY SIDE DOOR DOES NOT CLOSE SECURELY.		Improper door closure will have the same as malfunction 2.

Table 5-7. Organizational Troubleshooting - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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CABINET ASSEMBLY - Continued

4. REAR OR SIDE DOOR WILL NOT STAY IN OPEN POSITION.

Check door stays for mechanical binding and loose or missing door stay mounting brackets.

Notify next higher level of maintenance if any of the above conditions exist.

5. SEWING MACHINE HEAD IS LOOSE IN TRAY.

Check that tray strap assembly hinge is not loose.

If tray strap assembly is loose, replace or repair tray (para. 5-14 through 5-16).

6. STORAGE BOX DOES NOT CLOSE SECURELY.

Step 1. Check that storage box hinge is not bent or broken.

If hinge is bent or broken, replace storage box (para. 5-17).

Step 2. Check that storage box latch and latch hook are not deformed or broken.

If latch or latch hook is deformed or broken, refer to next higher level of maintenance.

7. SEWING MACHINE TRAYS OR TABLE ASSEMBLIES STICK OR SLIDE UNEVENLY.

Check condition of felt material on tray or slides.

If felt is worn or damaged, replace the felt (para. 5-13 through 5-16).

CLOTHING SEWING MACHINE

8. NEEDLE BREAKS.

Check for loose presser foot.

If presser foot is loose, notify next higher level of maintenance.

Table 5-7. Organizational Troubleshooting - Continued

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

CLOTHING SEWING MACHINE - Continued

9. FEED DOGS STRIKE THROAT PLATE.

Check that throat plate is fully into position.

If throat plate is in the full in position, notify next higher level of maintenance.

10. MACHINE VIBRATES.

Step 1. Check that machine-to-table mounting screws are tight.

If any screws are loose, tighten screws (para. 2-9).

Step 2. Check for 1/2-inch deflection at mid-point of drive belt.

If drive belt is out of adjustment, notify next higher level of maintenance.

Step 3. Check for loose or damaged drive pulley or machine pulley.

Notify next higher level of maintenance if any of the above conditions exist.

11. LAMP DOES NOT LIGHT.

Unplug power cord from outlet and inspect for frayed or broken insulation and wires.

If any of the above conditions exist, notify next higher level of maintenance.

Table 5-7. Organizational Troubleshooting - Continued

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

CLOTHING SEWING MACHINE - Continued

12. MOTOR DOES NOT START.

Use a multimeter and check for 110 Vac at power outlet.

- a. If power is not present, notify next higher level of maintenance that power cable may be defective.
- b. If power is present, notify next higher level of maintenance that motor or switch may be defective.

13. UNUSUAL NOISE IN MOTOR.

Notify next higher level of maintenance of defective motor.

14. MOTOR DOES NOT PULL LOAD.

Step 1. Check for loose, slipping, frayed, or deteriorated drive belt.

Replace drive belt.

Step 2. Use a multimeter and check that input voltage at power outlet is 110 Vac.

If voltage is low, check generator set for proper power output.

Step 3. Rotate handwheel, check sewing machine for binding.

If sewing machine is binding, replace sewing machine (para. 2-9).

If sewing machine is not binding, notify next higher level of maintenance of possible defective motor.

DARNING SEWING MACHINE

15. MACHINE VIBRATES.

Machine vibration will have the same tests and inspections as malfunction 10.

Table 5-7. Organizational Troubleshooting - Continued

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

DARNING SEWING MACHINE - Continued

16. LAMP DOES NOT LIGHT.

The causes of this malfunction will be the same as those of malfunction 11.

17. MOTOR DOES NOT START.

The causes of this malfunction will be the same as those of malfunction 12.

18. UNUSUAL NOISE IN MOTOR.

The causes of this malfunction will be the same as those of malfunction 13.

19. MOTOR DOES NOT PULL LOAD.

The causes of this malfunction will be the same as those of malfunction 14.

BUTTON SEWING MACHINE

20. LAMP DOES NOT LIGHT.

The causes of this malfunction will be the same as those of malfunction 11.

21. MOTOR DOES NOT START.

The causes of this malfunction will be the same as those of malfunction 12.

22. UNUSUAL NOISE IN MOTOR.

The causes of this malfunction will be the same as those of malfunction 13.

23. MOTOR DOES NOT PULL LOAD.

The causes of this malfunction will be the same as those of malfunction 14.

SECTION V. MAINTENANCE OF CABINET ASSEMBLY

<p>Para.</p> <p>Button Sewing Machine Tray Assembly Maintenance 5-16 Chair Holddown and Stand..... Container Maintenance 5-11 Clothing Sewing Machine..... Tray Maintenance 5-14 Darning Sewing Machine Tray Maintenance 5-15</p>	<p>Para.</p> <p>Folding Table Maintenance 5-13 General 5-10 Lifting Loop Assembly Maintenance..... 5-12</p>
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5- 10. GENERAL.

This section contains information on the removal, cleaning, inspection, repair, and installation of the various parts of the cabinet assembly that are maintainable at the Organizational Maintenance Level.

5-11. CHAIR HOLDDOWN AND STAND CONTAINER MAINTENANCE.

This task covers:

- | | | |
|------------------------------|------------|-----------------|
| a. Installed Item Inspection | b. Removal | c. Cleaning |
| d. Inspection | e. Repair | f. Installation |
-

INITIAL SETUP

<u>Applicable Configuration</u>	Equipment Condition	
All	<u>Para.</u> 2-9	<u>Condition Description</u> Generator removed from cabinet.
<u>Test Equipment</u>	2-9	Chairs removed from cabinet.
None	2-9	Table tops removed from cabinet.
<u>Special Tools</u>	2-9	Folding stands removed from cabinet.
None		
<u>Materials/Parts</u>	<u>Special Environmental Conditions</u>	
None	None	
<u>Personnel Required</u>	<u>General Safety Instructions</u>	
1 person	None	

GO TO NEXT PAGE

5-11. CHAIR HOLDDOWN AND STAND CONTAINER MAINTENANCE - Continued.

a. Installed Item Inspection

- (1) Inspect for loose or missing hardware.
- (2) Inspect for torn, ripped, or deteriorated strap webbing.
- (3) Inspect for missing or damaged buckles.

b. Removal. (Refer to Figure 5-1).

- (1) Remove two nuts (1), two lockwashers (2), two bolts (3), and strap (4).
- (2) Separate retainer (5) from strap (4).
- (3) Repeat steps (1) and (2) for other strap.

LEGEND:

- 1. Nut
- 2. Lockwasher
- 3. Bolt
- 4. Strap
- 5. Retainer

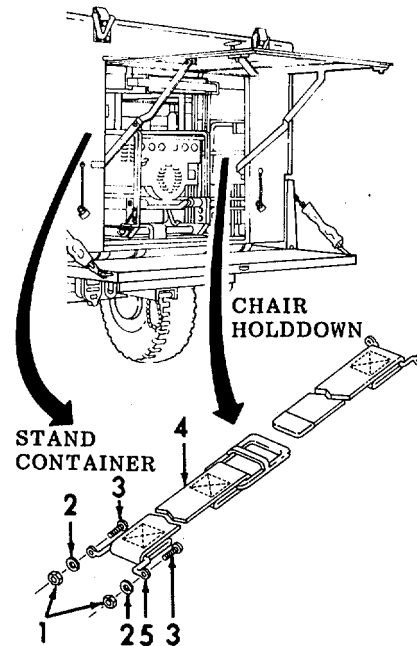


Figure 5-1. Chair Holddown and Stand Container, Removal.

c. Cleaning.

- (1) Wash the straps with a solution of mild soap and water.
- (2) Rinse thoroughly with clean water.
- (3) Wipe dry with a clean cloth (Appendix E, item 3).

d. Inspection.

- (1) Inspect for damaged hardware.
- (2) Inspect for torn, ripped, or deteriorated strap webbing.
- (3) Inspect for missing or damaged buckles.

e. Repair. Repair is limited to the replacement of defective parts.

GO TO NEXT PAGE

5-11. CHAIR HOLDDOWN AND STAND CONTAINER MAINTENANCE- Continued.

f. *Installation.* (Refer to Figure 5-2).

LEGEND:

- | | |
|-------------|---------------|
| 1. Retainer | 4. Lockwasher |
| 2. Strap | 5. Nut |
| 3. Bolt | |

- (1) Install retainer (1) into loop on strap (2).
- (2) Install strap (2) into position.
- (3) Install two bolts (3), two lockwashers (4), and two nuts (5) to secure the hold-down to the cabinet. Tighten the nuts (5) and bolts (3) securely. Repeat for other straps.

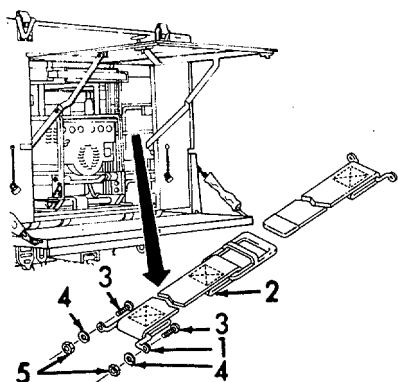


Figure 5-2. Chair Holddown and Stand Container, Installation.

END OF TASK

5-12. LIFTING LOOP ASSEMBLY MAINTENANCE.

This task covers:

- | | | |
|------------------------------|------------|-----------------|
| a. Installed Item Inspection | b. Removal | c. Cleaning |
| d. Inspection | e. Repair | f. Installation |

INITIAL SETUP

Applicable Configuration
All

Equipment Condition
Para.

Condition Description
None

Test Equipment
None

Special Environmental Conditions
None

Special Tools
None

General Safety Instructions
None

Materials/Parts
None

Personnel Required
1 person

GO TO NEXT PAGE

5-12. LIFTING LOOP ASSEMBLY MAINTENANCE - Continued.

a. Installed Item Inspection.

- (1) Inspect for loose or missing hardware.
- (2) Inspect for cracks, broken parts, rust, and corrosion.

b. Removal. (Refer to Figure 5-3).

LEGEND:

- | | | | | | | | | | | | | | |
|---|---|--------|-----------|---------------|------------------|------------------|---------|------------------|-----------|---------|----------------|---------------|----------|
| <ul style="list-style-type: none"> (1) From inside the cabinet, remove four nuts (1), four lockwashers (2), and two backing plates (3 and 4). (2) From outside the cabinet, remove four bolts (5), four lockwashers (6), four washers (7), and lifting loop assembly (8). Remove shims (9). | <table border="0"> <tr> <td>1. Nut</td> <td>7. Washer</td> </tr> <tr> <td>2. Lockwasher</td> <td>8. Loop Assembly</td> </tr> <tr> <td>3. Backing Plate</td> <td>9. Shim</td> </tr> <tr> <td>4. Backing Plate</td> <td>10. Screw</td> </tr> <tr> <td>5. Bolt</td> <td>11. Lockwasher</td> </tr> <tr> <td>6. Lockwasher</td> <td>12. Clip</td> </tr> </table> | 1. Nut | 7. Washer | 2. Lockwasher | 8. Loop Assembly | 3. Backing Plate | 9. Shim | 4. Backing Plate | 10. Screw | 5. Bolt | 11. Lockwasher | 6. Lockwasher | 12. Clip |
| 1. Nut | 7. Washer | | | | | | | | | | | | |
| 2. Lockwasher | 8. Loop Assembly | | | | | | | | | | | | |
| 3. Backing Plate | 9. Shim | | | | | | | | | | | | |
| 4. Backing Plate | 10. Screw | | | | | | | | | | | | |
| 5. Bolt | 11. Lockwasher | | | | | | | | | | | | |
| 6. Lockwasher | 12. Clip | | | | | | | | | | | | |

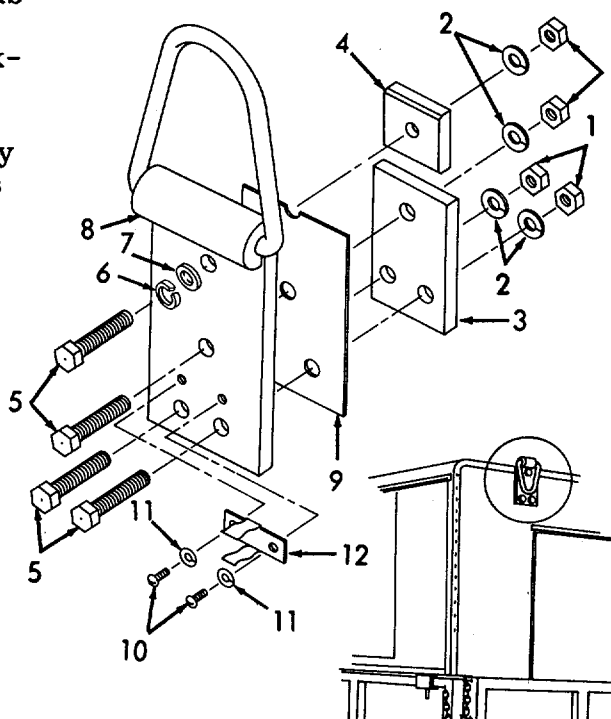


Figure 5-3. Lifting Loop Assembly Removal

c. Cleaning.

- (1) Wash the lifting loop assembly with a solution of mild soap and water.
- (2) Rinse thoroughly with clean water.
- (3) Allow to dry.

GO TO NEXT PAGE

5-12. LIFTING LOOP ASSEMBLY MAINTENANCE - Continued.

d. Inspection.

- (1) Inspect for damaged hardware.
- (2) Inspect for cracks, broken parts, rust, and corrosion.

e. Repair. Repair of the lifting loop is limited to the replace of a defective clip as follows (refer to Figure 5-3):

- (1) Remove two screws (10), two lockwashers (11), and clip (12).
- (2) Install clip (12), two lockwashers (11), and two screws (10).

f. Installation. (Refer to Figure 5-4).

LEGEND:

- 1. Loop Assembly(1) into position.
- 2. Washer
- 3. Lockwasher
- 4. Bolt
- 5. Shim
- 6. Backing Plate
- 7. Backing Plate
- 8. Lockwasher
- 9. Nut

- (1) Install lifting loop assembly
- (2) Install four washers (2), four lockwashers (3), and four bolts (4).
- (3) Make sure that shim (5) is still in position. Install backing plates (6 and 7), four lockwashers (8), and four nuts (9).

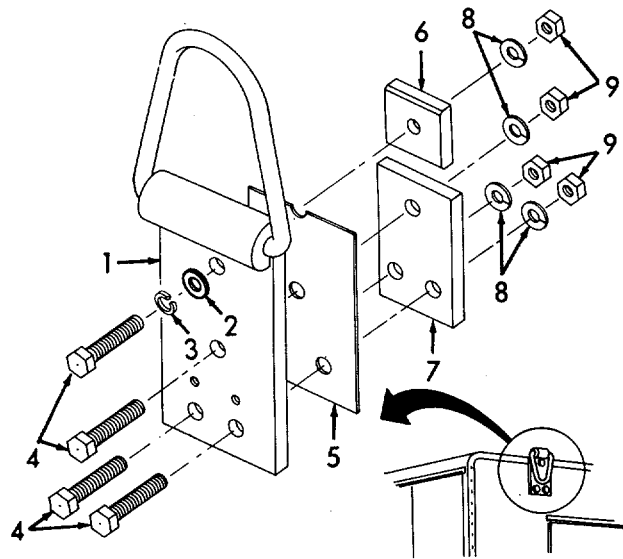


Figure 5-4. Lifting Loop Assembly, Installation.

END OF TASK

5-13. FOLDING TABLE MAINTENANCE.

This task covers:

- | | | |
|------------------------------|------------|-----------------|
| a. Installed Item Inspection | b. Removal | c. Cleaning |
| d. Inspection | e. Repair | f. Installation |
-

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

None

Personnel Required

1 person

Equipment
Condition

Para.

2-9

Condition Description

Table removed and set-up.

Special Environmental Conditions

None

General Safety Instructions

None

-
- a. *Removal.* Refer to paragraph 2-9.
 - b. *Cleaning.*
 - (1) Clean the folding table with a solution of mild soap and water.
 - (2) Rinse thoroughly with clean water.
 - (3) Allow to dry.
 - c. *Inspection.*
 - (1) Inspect for damaged hardware.
 - (2) Inspect for damage to the leg latch assembly.
 - (3) Inspect for rust, corrosion, or damage to the legs.
 - (4) Inspect the top stiffener for damage.
 - (5) Inspect top for cracks, splits, warps, and other damage.

GO TO NEXT PAGE

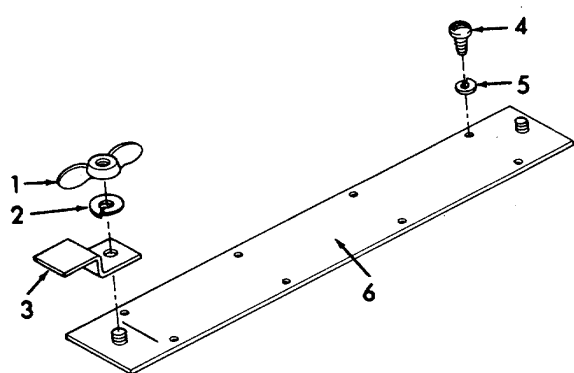
5-13. FOLDING TABLE MAINTENANCE - Continued.

d. *Repair.* Repair is limited to the following:

- (1) Refinishing of a damaged top.
- (2) Replacement of defective leg latch assembly as follows:

LEGEND:

- | | |
|---------------|---------------|
| 1. Wingnut | 4. Screw |
| 2. Lockwasher | 5. Lockwasher |
| 3. Latch | 6. Base Plate |



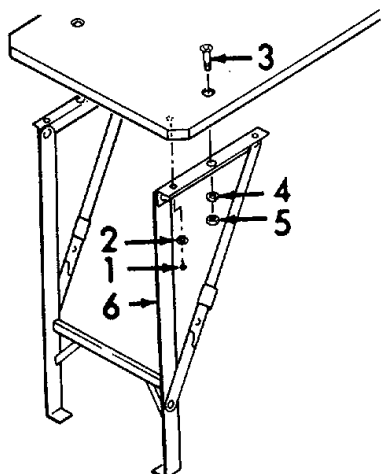
- (a) Refer to Figure 5-5. Remove wingnut (1), lockwasher (2), and latch (3). Repeat for other latch.
- (b) Remove eight screws (4), eight lockwashers (5), and base plate (6).
- (c) Inspect and then exchange parts as required.
- (d) Install base plate (6), eight lockwashers (5), and eight screws (4).
- (e) Install latch (3), lockwasher (2), and wingnut (1). Repeat for other latch.

Figure 5-5. Leg Latch, Repair.

(3) Replacement of defective leg assembly as follows:

LEGEND:

- | | |
|---------------|-----------------|
| 1. Screw | 4. Lockwasher |
| 2. Lockwasher | 5. Nut |
| 3. Screw | 6. Leg Assembly |



- (a) Refer to Figure 5-6. Remove two screws (1) and two lockwashers (2) from table top. Repeat for other side.
- (b) Remove two screws (3), two lockwashers (4), two nuts (5), and leg assembly (6).
- (c) Inspect and then exchange parts as required.
- (d) Place leg assembly (6) into position. Secure with screw (3), lockwasher (4), nut (5), two lockwashers (2), and two screws (1). Repeat for other side.

Figure 5-6. Leg Assembly, Replacement.

GO TO NEXT PAGE

5-13. FOLDING TABLE MAINTENANCE - Continued.

d. Repair - Continued.

(4) Replace a defective top stiffener as follows:

- (a) Refer to Figure 5-7. Remove five screws (1), five lockwashers (2), and stiffeners (3).

LEGEND:

- 1. Screw
- 2. Lockwasher
- 3. Stiffener

- (b) Exchange parts as required.

- (c) Install stiffener (3), five lockwashers (2), and five screws (1).

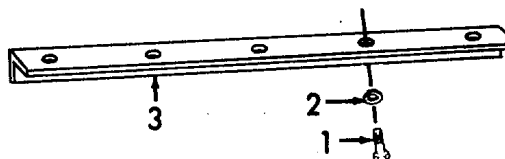


Figure 5-7. Top Stiffener, Replacement.

e. Installation. Refer to paragraph 2-9.

END OF TASK

5-14. CLOTHING SEWING MACHINE TRAY MAINTENANCE.

This task covers:

- | | | |
|------------------------------|------------|-----------------|
| a. Installed Item Inspection | b. Removal | c. Cleaning |
| d. Inspection | e. Repair | f. Installation |

INITIAL SETUP

Applicable Configuration
All

Equipment Condition
Para. 2-9

Condition Description
Sewing machine removed.

Test Equipment
None

Special Environmental Conditions
None

Special Tools
None

General Safety Instructions
None

Materials/Parts
Adhesive (Appendix E, item 7)

Personnel Required
1 person

GO TO NEXT PAGE

5-14. CLOTHING SEWING MACHINE TRAY MAINTENANCE - Continued.

a. Installed Item Inspection.

- (1) Inspect for damaged wood.
- (2) Inspect for damaged holddown straps and tray pulls.
- (3) Inspect for loose or missing hardware.
- (4) Inspect for damaged felt and rubber shock absorbers.

b. Removal. (Refer to Figure 5-8).

LEGEND:

- | | |
|---------------|---------|
| 1. Nut | 4. Stop |
| 2. Lockwasher | 5. Tray |
| 3. Screw | |

- (1) Remove two nuts (1), two lockwashers (2), two screws (3), and stop (4).

- (2) Remove tray (5).

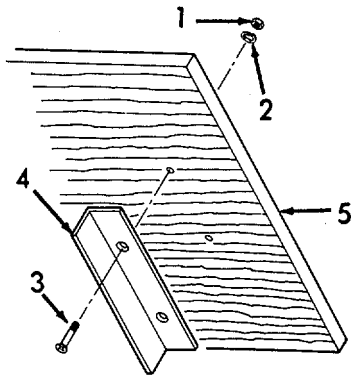


Figure 5-8. Clothing Sewing Machine Tray, Removal.

c. Cleaning.

- (1) Clean the tray assembly with a solution of mild soap and water.
- (2) Rinse thoroughly with clean water.
- (3) Allow to dry.

d. Inspection.

- (1) Inspect for damaged wood.
- (2) Inspect for damaged holddown straps and tray pulls.
- (3) Inspect for damaged hardware.
- (4) Check that felt and rubber shock absorbers are not damaged or deteriorated.

GO TO NEXT PAGE

5-14. CLOTHING SEWING MACHINE TRAY MAINTENANCE - Continued.

e. *Repair.* Repair is limited to the following:

- (1) Replacement of the holddown strap as follows (refer to Figure 5-9):
 - (a) Remove two wingnuts (1) and holddown strap (2) from tray (3).
 - (b) Install holddown strap (2) and secure with two wingnuts (1).

LEGEND:

- 1. Wingnut
- 2. Holddown Strap
- 3. Tray

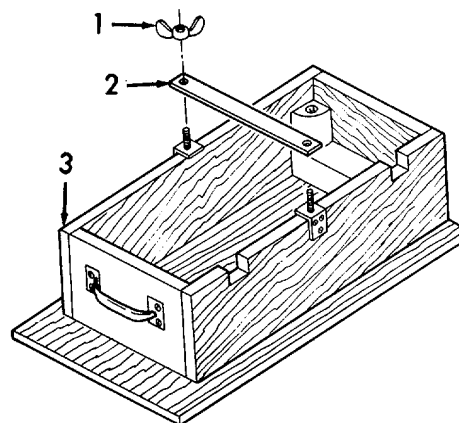


Figure 5-9. Holddown Strap, Replacement.

- (2) Replacement of the rubber bumpers as follows (refer to Figure 5-10):
 - (a) Remove screw (1) and rubber bumper (2) from tray (3).
 - (b) Install bumper (2) and screw (1).

LEGEND:

- 1. Screw
- 2. Rubber Bumper
- 3. Tray

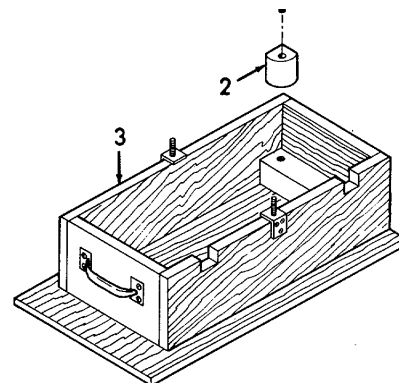


Figure 5-10. Rubber Bumpers, Replacement.

GO TO NEXT PAGE

5-14. CLOTHING SEWING MACHINE TRAY MAINTENANCE - Continued.

e. Repair - Continued.

LEGEND:

- 1. Shock Absorber
- 2. Holddown Strap

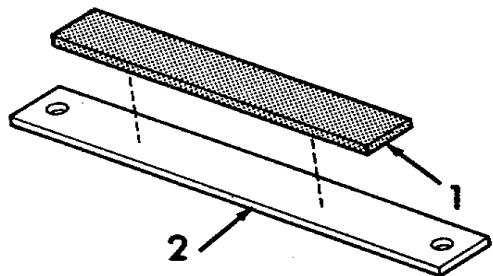


Figure 5-11. Felt Shock Absorber, Replacement.

- (3) Replacement of the felt shock absorber as follows (refer to Figure 5-11):
 - (a) Scrape off old shock absorber (1) from holddown strap (2).
 - (b) Install a new shock absorber (1) to the holddown strap (2) using adhesive (Appendix E, item 7).

LEGEND:

- 1. Screw
- 2. Handle
- 3. Tray

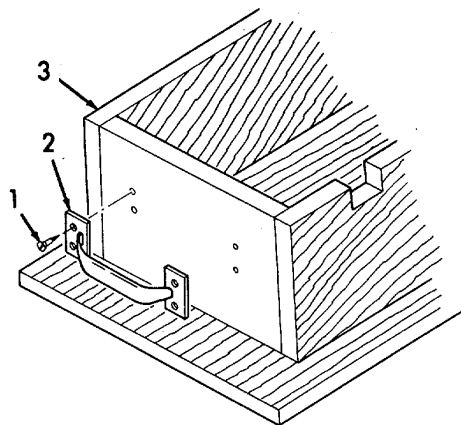


Figure 5-12. Handle, Replacement.

- (4) Replacement of the handle (refer to Figure 5-12).
 - (a) Remove four screws (1) and handle (2) from tray (3).
 - (b) Install handle (2) and secure with four screws (1).

GO TO NEXT PAGE

5-14. CLOTHING SEWING MACHINE TRAY MAINTENANCE -

Continued.

f. *Installation.* (Refer to Figure 5-13).

- (1) Install tray (1) into position.
- (2) Install stop (2), and secure with two screws (3), two lockwashers (4), and two nuts (5).

LEGEND:

- 1. Tray
- 2. Stop
- 3. Screw
- 4. Lockwasher
- 5. Nut

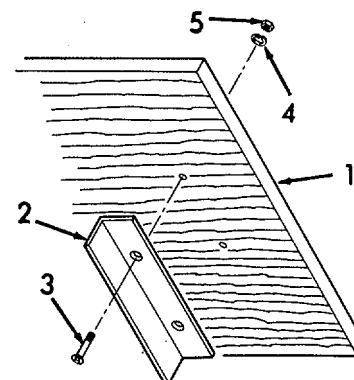


Figure 5-13. Clothing Sewing Machine Tray, Installation.

END OF TASK

5-15. DARNING SEWING MACHINE TRAY MAINTENANCE.

This task covers:

- a. Installed Item Inspection
- b. Removal
- c. Cleaning
- d. Inspection
- e. Repair
- f. Installation

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

Adhesive (Appendix E, item 7)

Personnel Required

1 person

Equipment Condition

Para.
2-9

Condition Description
Sewing machine removed.

Special Environmental Conditions

None

General Safety Instructions

None

5-15. DARNING SEWING MACHINE TRAY MAINTENANCE - Continued.

a. Installed Item Inspection.

- (1) Inspect for damaged wood.
- (2) Inspect for rust, corrosion, and visible damage.
- (3) Inspect for damaged holddown straps and tray pulls.
- (4) Inspect for loose or missing hardware.
- (5) Check that felt absorbers are not damaged or deteriorated.

b. Removal.

LEGEND:

- | | |
|---------------|---------|
| 1. Nut | 4. Stop |
| 2. Lockwasher | 5. Tray |
| 3. Screw | |

- (1) Remove two nuts (1), two lockwashers (2), two screws (3), and stop (4).
- (2) Remove tray (5).

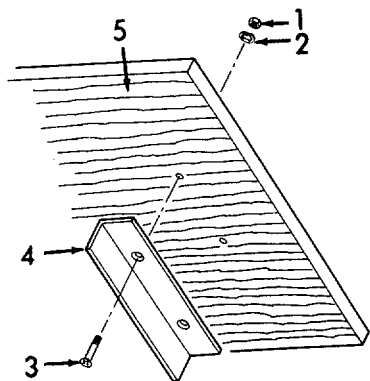


Figure 5-14. Darning Sewing Machine Tray Removal

c. Cleaning.

- (1) Clean the tray assembly with a solution of mild soap and water.
- (2) Rinse thoroughly with clean water.
- (3) Wipe or blow dry.

GO TO NEXT PAGE

5-15. DARNING SEWING MACHINE TRAY MAINTENANCE - Continued.

d. Inspection.

- (1) Inspect for damaged wood.
- (2) Inspect for rust, corrosion, and visible damage.
- (3) Inspect for damaged holddown straps and tray pulls.
- (4) Inspect for loose, missing, or damaged hardware.
- (5) Check that felt absorbers are not damaged or deteriorated.

e. Repair. Repair is limited to the following:

- (1) Replacement of the holddown strap as follows (refer to Figure 5-15).

- (a) Remove wingnut (1).
- (b) Remove four screws (2) and hinged strap (3).
- (c) Remove four screws (4) and strap (5).
- (d) Install strap (5) and secure with four screws (4).
- (e) Install hinged strap (3) and four screws (2).
- (f) Install wingnut (1).

LEGEND:

- | | |
|-----------------|----------|
| 1. Wingnut | 4. Screw |
| 2. Screw | 5. Strap |
| 3. Hinged Strap | |

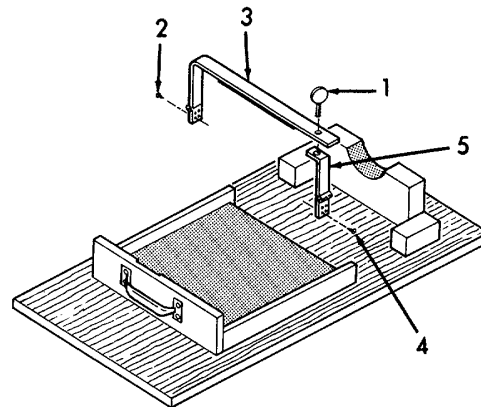


Figure 5-15. Holddown Strap, Replacement.

GO TO NEXT PAGE

5-15. DARNING SEWING MACHINE TRAY MAINTENANCE - Continued.

e. Repair - Continued.

(2) Replacement of any of the felt shock absorbers is as follows (refer to Figure 5-16):

LEGEND:

- | | |
|-------------------|-----------------|
| 1. Shock Absorber | 4. Hinged Strap |
| 2. Shock Absorber | 5. Tray |
| 3. Shock Absorber | |

- (a) Remove old shock absorber (1, 2, or 3) by scraping it off the hinged strap (4) or the tray (5), as required.
- (b) Install new shock absorber (1, 2, or 3) to hinged strap (4) or tray (5) using adhesive (Appendix E, item 7).

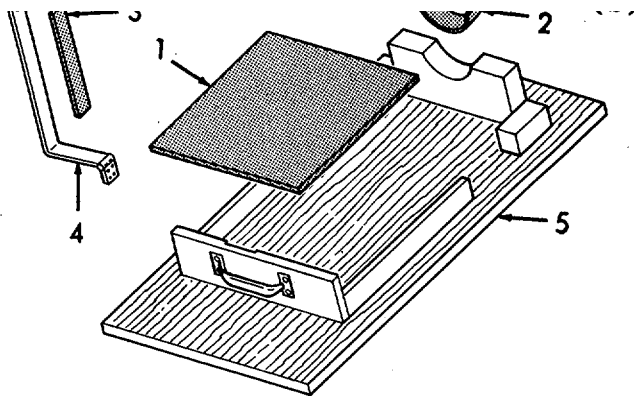


Figure 5-16. Shock Absorber, Replacement.
Figure 5-16. Shock Absorber, Replacement.

(3) Replacement of the handle as follows (refer to Figure 5-17):

LEGEND:

- | |
|-----------|
| 1. Screw |
| 2. Handle |
| 3. Tray |

- (a) Remove four screws (1).
- (b) Remove handle (2) from tray (3).
- (c) Install handle (2) into position on tray (3).
- (d) Secure with four screws (1).

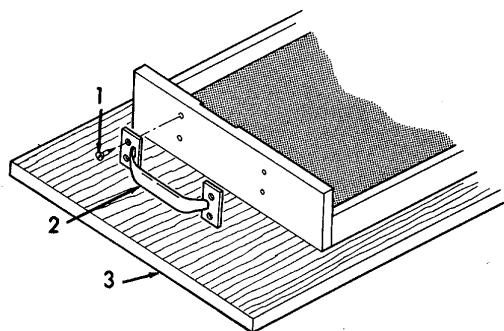


Figure 5-17. Handle, Replacement.

GO TO NEXT PAGE

5-15. DARNING SEWING MACHINE TRAY MAINTENANCE - Continued.

f. *Installation.* (Refer to Figure 5-18).

- (1) Install tray (1).
- (2) Install stop (2).
- (3) Install two screws (3), two lockwashers (4), and two nuts (5).

LEGEND:

- 1. Tray
- 2. Stop
- 3. Screw
- 4. Lockwasher
- 5. Nut

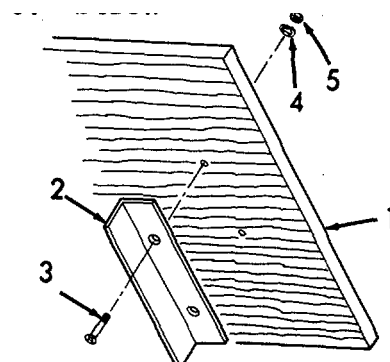


Figure 5-18. Darning Sewing Machine Tray, Installation.

END OF TASK

5-16. BUTTON SEWING MACHINE TRAY ASSEMBLY MAINTENANCE.

This task covers:

- a. Installed Item Inspection
- b. Removal
- c. Cleaning
- d. Inspection
- e. Repair
- f. Installation

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

Adhesive (Appendix E, item 7)

Personnel Required

1 person

Equipment

Condition

Para.

2-9

Condition Description

Sewing machine removed.

Special Environmental Conditions

None

General Safety Instructions

None

**5-16. BUTTON SEWING MACHINE TRAY ASSEMBLY
MAINTENANCE - Continued.**

a. Installed Item Inspection.

- (1) Inspect for damaged wood.
- (2) Inspect for rust, corrosion, and visible damage.
- (3) Inspect for damaged holddown straps and tray pulls.
- (4) Inspect for loose or missing hardware.
- (5) Check that felt absorbers are not damaged or deteriorated.

b. Removal. (Refer to Figure 5-19).

LEGEND:

- | | |
|---------------|---------|
| 1. Nut | 4. Stop |
| 2. Lockwasher | 5. Tray |
| 3. Screw | |

- (a) Remove two nuts (1), two lockwashers (2), and two screws (3).
- (b) Remove stop (4).
- (c) Remove tray (5).

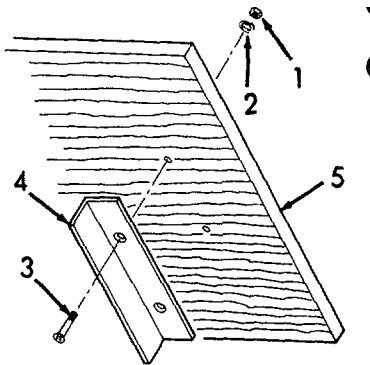


Figure 5-19. Button Sewing Machine Tray, Removal.

c. Cleaning.

- (1) Clean the tray assembly with a solution of mild soap and water.
- (2) Rinse thoroughly with clean water.
- (3) Wipe or blow dry.

d. Inspection.

- (1) Inspect for damaged wood.
- (2) Inspect for rust, corrosion, and visible damage.
- (3) Inspect for damaged holddown straps and tray pulls.
- (4) Inspect for damaged hardware.
- (5) Check that felt absorbers are not damaged or deteriorated.

END OF TASK

GO TO NEXT PAGE

**5-16. BUTTON SEWING MACHINE TRAY ASSEMBLY
MAINTENANCE - Continued.**

e. *Repair.* Repair is limited to the following:

(1) Replacement of the holddown straps as follows (refer to Figure 5-20).

- (a) Remove wingnut (1).
- (b) Remove four screws (2) and strap (3).
- (c) Remove four screws (4) and strap (5).
- (d) Install strap (5) and four screws (4).
- (e) Install strap (3) and four screws (2).
- (f) Install wingnut (1).

LEGEND:

- | | |
|------------|----------|
| 1. Wingnut | 4. Screw |
| 2. Screw | 5. Strap |

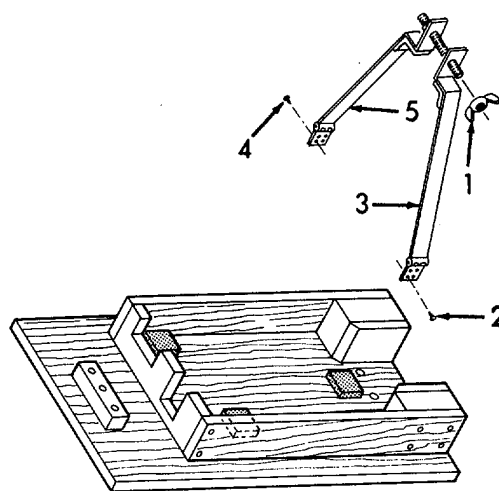


Figure 5-20. Holddown Straps, Replacement.

(2) Replacement of any of the felt shock absorbers as follows (refer to Figure 5-21):

- (a) Remove old shock absorbers (1, 2, or 3) from tray (4) by scraping it off.
- (b) Install new shock absorber (1, 2, or 3) to tray (4) using adhesive (Appendix E, item 7).

LEGEND:

- | |
|-------------------|
| 1. Shock Absorber |
| 2. Shock Absorber |
| 3. Shock Absorber |
| 4. Tray |

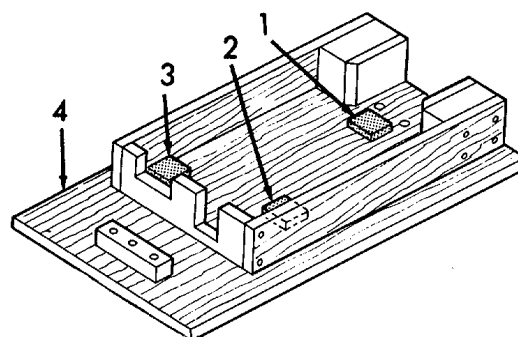


Figure 5-21. Shock Absorber, Replacement.

GO TO NEXT PAGE

**5-16. BUTTON SEWING MACHINE TRAY ASSEMBLY
MAINTENANCE - Continued.**

f. *Installation.* (Refer to Figure 5-22).

LEGEND:

- | | |
|----------|---------------|
| 1. Tray | 4. Lockwasher |
| 2. Stop | 5. Nut |
| 3. Screw | |

- (1) Install tray (1).
- (2) Install stop (2).
- (3) Install two screws (3), two lockwashers (4), and two nuts (5).

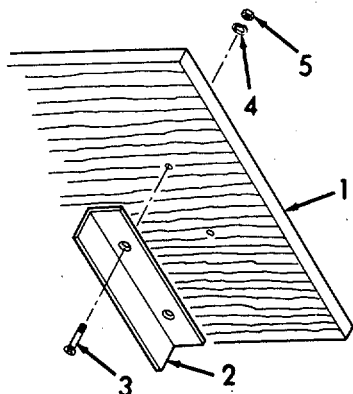


Figure 5-22. Button Sewing Machine Tray, Installation.

SECTION VI. MAINTENANCE OF SEWING MACHINE TABLES

General	Para. 5-17	Knee Lifter Assembly Maintenance.....	Para. 5-19
Folding Stand Assembly.....		Table Top Assembly Maintenance.....	5-18
Maintenance	5-20		
.....			

5-17. GENERAL.

This section contains information on the removal, cleaning, inspection, repair, and installation of the various parts of the clothing sewing machine that are maintainable at the Organizational Maintenance Level.

5-18. TABLE TOP ASSEMBLY MAINTENANCE.

This task covers:

- a. Removal b. Cleaning c. Repair d. Installation
-

INITIAL SETUP

Applicable Configuration

All

Equipment
Condition

Para.

Condition Description

2-9

Table top removed.

Test Equipment

None

Special Environmental Conditions

None

Special Tools

None

General Safety Instructions

None

Materials/Parts

None

Personnel Required

1 person

a. *Removal.* Refer to paragraph 2-9.

b. *Cleaning.*

(1) Clean the table top assembly with a solution of mild soap and water. Do not wash the motor.

(2) Rinse thoroughly with clean water.

(3) Allow to dry.

c. *Repair.* Repair at the organizational level is limited to the following:

(1) Replacement of the machine rest pin (paragraph 2-9).

(2) Replacement of the oil drip pan (paragraph 2-9).

(3) Replacement of the bobbin winder (paragraph 2-9).

(4) Replacement of the thread unwinder assembly (paragraph 2-9).

d. *Installation.* Refer to paragraph 2-9.

END OF TASK

5-19. KNEE LIFTER ASSEMBLY MAINTENANCE.

This task covers:

- | | | |
|------------------------------|------------|-----------------|
| a. Installed Item Inspection | b. Removal | c. Cleaning |
| d. Inspection | e. Repair | f. Installation |

INITIAL SETUP

Applicable Configuration

All

Equipment
Condition

Para.

2-9

Condition Description

Clothing sewing machine removed.

Test Equipment

None

Special Environmental Conditions

None

Special Tools

None

Personnel Required

1 person

Materials/Parts

Brush

(Appendix E, item 1)

Cleaning Solvent

(Appendix E, item 2)

Cloth

(Appendix E, item 3)

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

a. Installed Item Inspection.

(1) Inspect for loose or missing hardware.

(2) Inspect for rust/corrosion and damaged parts.

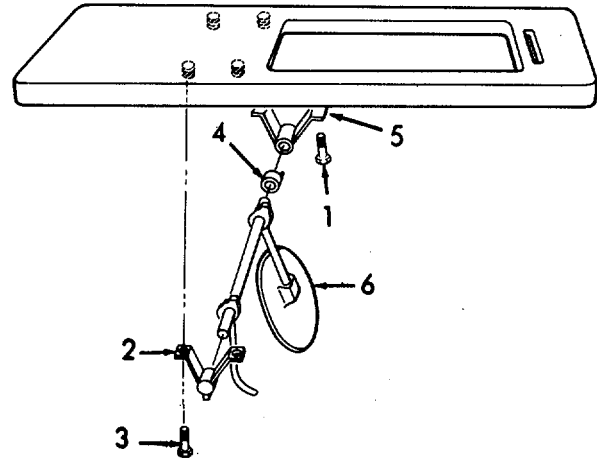
GO TO NEXT PAGE

5-19. KNEE LIFTER ASSEMBLY MAINTENANCE - Continued.*b. Removal.* (Refer to Figure 5-23).

- (1) Remove two screws (1) and bracket (2).
- (2) Remove two screws (3), stop (4), and bracket (5).
- (3) Remove knee lifter assembly (6).

LEGEND:

- | | |
|------------|-------------------------|
| 1. Screw | 4. Stop |
| 2. Bracket | 5. Bracket |
| 3. Screw | 6. Knee Lifter Assembly |

**Figure 5-23. Knee Lifter Assembly Removal.***c. Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a brush (Appendix E, item 1) or a cloth (Appendix E, item 3).
- (3) Allow to dry.

d. Inspection.

- (1) Inspect for loose, missing, or damaged hardware.
- (2) Inspect for rust/corrosion and damaged parts.

GO TO NEXT PAGE

5-19. KNEE LIFTER ASSEMBLY MAINTENANCE - Continued.

- e. *Repair.* Repair of the knee lifter assembly is limited to the replacement of defective parts.
- f. *Installation.* (Refer to Figure 5-24).

LEGEND:

- 1. Knee Lifter Assembly.
- 2. Bracket
- 3. Stop
- 4. Screw
- 5. Bracket
- 6. Screw

- (1) Place knee lifter assembly (1) into position
- (2) Install bracket (2), stop (3), and secure with two screws (4).
- (3) Install bracket (5), and secure with two screws (6).

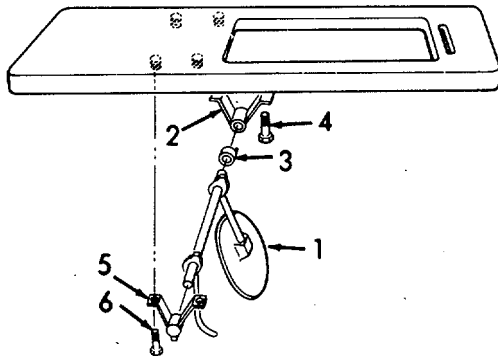


Figure 5-24. Knee Lifter Assembly, Installation.

END OF TASK

5-20. FOLDING STAND ASSEMBLY MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Repair
- d. Installation

INITIAL SETUP

<p><u>Applicable Configuration</u> All</p>	<p>Equipment Condition <u>Para.</u> 2-9</p>	<p><u>Condition Description</u> Folding stand removed.</p>
<p><u>Test Equipment</u> None</p>	<p><u>Special Environmental Conditions</u> None</p>	
<p><u>Special Tools</u> None</p>	<p><u>General Safety Instructions</u> None</p>	
<p><u>Materials/Parts</u> None</p>	<p><u>Personnel Required</u> 1 person</p>	

GO TO NEXT PAGE

5-20. FOLDING STAND ASSEMBLY MAINTENANCE - Continued.

- a. *Removal.* Refer to paragraph 2-9.
- b. *Cleaning.*
 - (1) Clean the folding stand assembly with solution of mild soap and water.
 - (2) Rinse thoroughly with clean water.
 - (3) Allow to dry.
- c. *Repair.* Repair of the folding stand assembly is limited to the replacement of defective hardware.
- d. *Installation.* Refer to paragraph 2-17.

END OF TASK

SECTION VII. MAINTENANCE OF THE GROMMET PRESS

General	Para. 5-21	Grommet Press Maintenance.....	Para. 5-22
---------------	------------	--------------------------------	------------

5- 21. GENERAL.

This section contains information on the removal, cleaning, inspection, repair, and installation of the grommet press.

5-22. GROMMET PRESS MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Equipment
Condition

Para.

2-9

Condition Description

Table top removed.

Test Equipment

None

Special Environmental Conditions

None

Special Tools

None

Personnel Required

1 person

Materials/Parts

Brush

(Appendix E, item 1)

Cleaning Solvent

(Appendix E, item 2)

Cloth

(Appendix E, item 3)

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

a. *Removal.* Refer to Figure 2-9.

b. *Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

5-22. GROMMET PRESS MAINTENANCE - Continued.

b. Cleaning - Continued.

(2) Clean using cleaning solvent (Appendix E, item 2) and either a brush (Appendix E, item 1) or a cloth (Appendix E, item 3).

(3) Allow to dry.

c. Inspection.

(1) Inspect for loose, missing, or damaged hardware.

(2) Inspect for rust/corrosion and damaged parts.

d. Repair. Repair of the grommet press is limited to the replacement of the chucks and dies.

e. Installation. Refer to paragraph 2-9.

END OF TASK

**SECTION VIII. MAINTENANCE OF THE TACK-BUTTON
ATTACHING MACHINE**

	Para.		Para.
General.....	5-23	Tack-Button Attaching Machine Maintenance	5-24

5-23. GENERAL.

This section contains information on the removal, cleaning, inspection, repair, and installation of the tack-button attaching machine.

5-24. TACK-BUTTON ATTACHING MACHINE MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Equipment
Condition

Para.

2-9

Condition Description

Tack-button attaching
machine removed.

Test Equipment

None

Special Environmental Conditions

None

Special Tools

None

Personnel Required

1 person

Materials/Parts

Brush 1 person

(Appendix E, item 1)

Cleaning Solvent

(Appendix E, item 2)

Cloth

(Appendix E, item 3)

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

a. *Removal.* Refer to Figure 2-9.

b. *Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

5-24. TACK-BUTTON ATTACHING MACHINE MAINTENANCE - Continued.

b. Cleaning - Continued.

(2) Clean using cleaning solvent (Appendix E, item 2) and either a brush (Appendix E, item 1) or a cloth (Appendix E, item 3).

(3) Allow to dry.

c. Inspection.

(1) Inspect for loose, missing, or damaged hardware.

(2) Inspect for rust/corrosion and damaged parts.

d. Repair. Repair of the tack-button attaching machine is limited to the replacement of the upper and lower dies.

e. Installation. Refer to paragraph 2-9.

END OF TASK

SECTION IX. PREPARATION FOR STORAGE OR SHIPMENT

5-25. GENERAL.

Refer to TM 740-90-1, Administrative Storage of Equipment, and to TB 740-97-2, Preservation of Mechanical Equipment for Shipment and Storage.

CHAPTER 6

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

- Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT
- Section II. MAINTENANCE OF CABINET ASSEMBLY
- Section III. MAINTENANCE OF CLOTHING SEWING MACHINE
- Section IV. MAINTENANCE OF DARNING SEWING MACHINE
- Section V. MAINTENANCE OF BUTTON SEWING MACHINE

SECTION I. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

	Para.		Para.
Common Tools and Equipment	6-1	Special Tools, TMDE, and	
Repair Parts	6-3	Support Equipment	6-2

6-1. COMMON TOOLS AND EQUIPMENT.

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

6-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

For the special tools, TMDE, or support equipment authorized for the maintenance of the clothing repair shop, refer to Appendix B, Maintenance Allocation Chart.

6-3. REPAIR PARTS.

Repair parts are listed and illustrated in the repair parts and special tools list TM 10-3530-205-24P covering organizational, direct support and general support, and depot maintenance for this equipment.

SECTION II. MAINTENANCE OF CABINET ASSEMBLY

	Para.		Para.
Cabinet Assembly		Power Cable	
Maintenance	6-5	Maintenance	6-10
General	6-4	Rear Door Assembly	
Generator Track and Holddown		Maintenance	6-7
Assembly Maintenance	6-9	Side Door Assembly	
Holddown Clamp Assembly		Maintenance	6-6
Maintenance	6-8		

6-4. GENERAL.

This section contains information on the removal, disassembly, cleaning, inspection, repair, assembly, and installation of the various parts of the cabinet assembly that are maintained at the Direct Support Maintenance Level.

6-5. CABINET ASSEMBLY MAINTENANCE.

This task covers:

- | | | |
|------------------------------|------------|-----------------|
| a. Installed Item Inspection | b. Removal | c. Cleaning |
| d. Inspection | e. Repair | f. Installation |

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

Hoist (5,000 lb. capacity)

4 Chains (2,500 lb. capacity)

4 Cargo Straps (15 ft. lg.)

Equipment
Condition

Para.

2-9

2-9

2-9

2-9

2-9

Condition Description

All equipment removed.

Rear and side doors closed.

Hand brakes set.

Tailgate lowered.

Rear support leg lowered.

Special Environmental Conditions

None

Materials/Parts

None

Personnel Required

1 person

General Safety Instructions

WARNING

Be sure that all personnel are standing clear of the cabinet. Do not allow anyone near the cabinet while it is off the trailer or the ground.

GO TO NEXT PAGE

6-5. CABINET ASSEMBLY MAINTENANCE - Continued.

a. Installed Item Inspection.

- (1) Inspect for loose or missing hardware.
- (2) Inspect the door, panels, and other parts for damage.
- (3) Inspect the frame for damage.

b. Removal (Refer to Figures 6-1 and 6-2).

- (1) Refer to Figure 6-1. Pull the four lifting loops (1) from the spring clips and raise the loops up.
- (2) Attach a chain (2) to each lifting loop and to the hoist (3). Be sure the chains are all of equal length.
- (3) Attach a cargo strap (4) to each of the four lifting loops (1).
- (4) Refer to Figure 6-2. Loosen the screw (1) on each of the six holddown clamp assemblies (2).
- (5) Rotate the clamp arm pads (3) away from the trailer ledge.

LEGEND:

- 1. Lifting Loop
- 2. Chain
- 3. Hoist
- 4. Cargo Strap

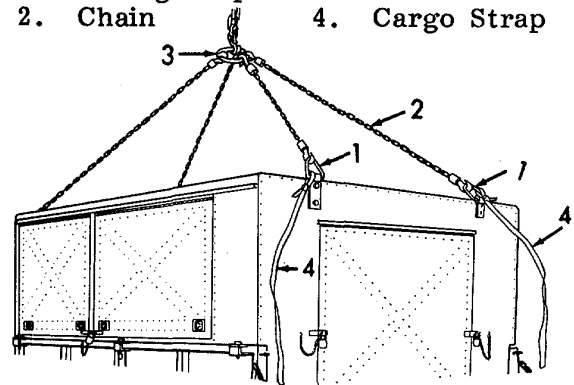


Figure 6-1. Holddown Clamp, Unhooking.

LEGEND:

LEGEND:

- 1. Screw
- 2. Clamp Assembly
- 3. Clamp Arm Pads

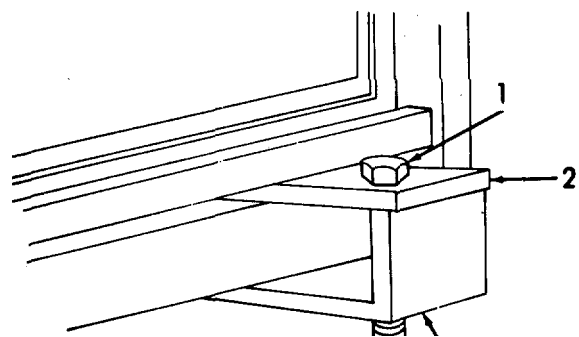


Figure 6-2. Holddown Clamp, Unhooking.

WARNING

Be sure that all personnel are standing clear of the cabinet. Do not allow anyone near the cabinet while it is off the trailer or the ground.

GO TO NEXT PAGE

6-5. CABINET ASSEMBLY MAINTENANCE - Continued.*b. Removal - Continued.*

- (6) Have one person hold the end of each of the four 15 foot cargo straps (4).
- (7) With four persons steadying the cabinet by using the four cargo straps (4), slowly lift the cabinet off the trailer.
- (8) When the cabinet assembly is clear of the trailer, move the cabinet assembly to a suitable area, (such as wooden pallets or jack stands).
- (9) Disconnect the chains and hoist from the lifting loops.

c. Cleaning.

- (1) Clean the cabinet assembly with a solution of mild soap and water.
- (2) Rinse thoroughly with clean water.
- (3) Allow to dry.

d. Inspection.

- (1) Inspect for loose, missing, or damaged hardware.
- (2) Inspect the door, panels, and other parts for damage.
- (3) Inspect the frame for damage.

e. Repair. Repair of the cabinet assembly is limited to those items in the maintenance paragraphs below.*f. Installation (Refer to Figures 6-3 and 6-4).*

- (1) Refer to Figure 6-3. Pull the four lifting loops (1) from the spring clips and raise the loops up.
- (2) Attach a chain (2) to each loop (1) and the hoist (3). Be sure the chains are of equal length.
- (3) Attach a cargo strap (4) to each lifting loop.

GO TO NEXT PAGE

6-5. CABINET ASSEMBLY MAINTENANCE - Continued.

f. Installation - Continued.

WARNING

Be sure that all personnel are standing clear of the cabinet. Do not allow anyone near the cabinet assembly while it is off the trailer or the ground.

- (4) Have one person hold the end of each of the four 15 foot cargo straps (4).
- (5) With the four persons using the cargo straps to steady the cabinet, slowly lift the cabinet assembly up and onto the trailer.
- (6) Disconnect the chains (2) and hoist (3) from the lifting loops (1).
- (7) Disconnect the cargo straps (4) from the lifting loops (1).
- (8) Refer to Figure 6-4. Rotate the clamp arm pad (1) into position on the trailer ledge.
- (9) Tighten the screw (2) on each of the six holddown clamp assemblies (3) securely.
- (10) Load the cabinet assembly as required (para. 2-16).

LEGEND:

- 1. Lifting Loop
- 2. Chain
- 3. Hoist
- 4. Cargo Strap

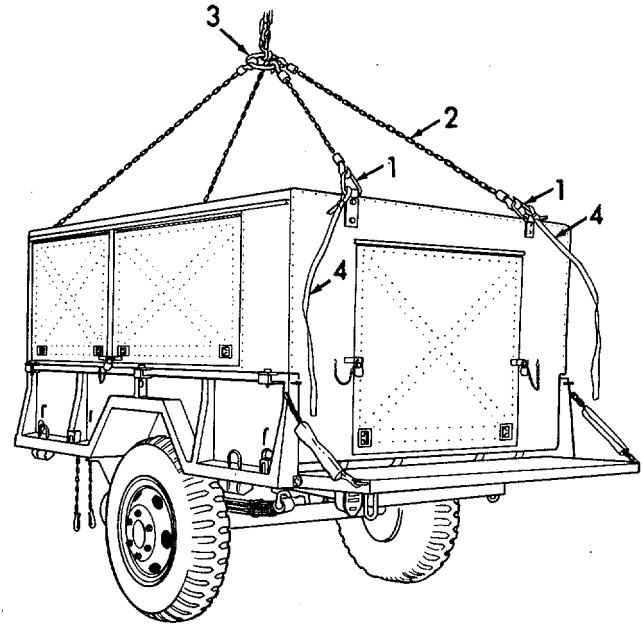


Figure 6-3. Connecting the Hoist.

LEGEND:

- 1. Clamp Arm Pad
- 2. Screw
- 3. Clamp Assemblies

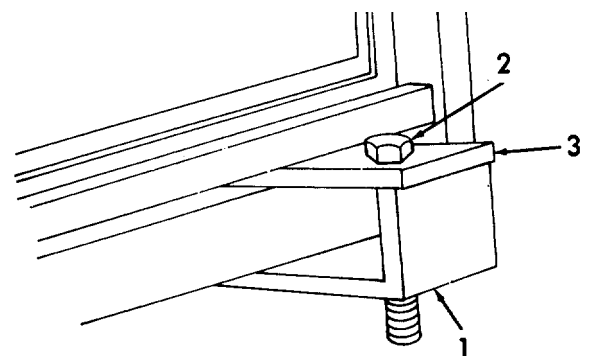


Figure 6-4. Holddown Clamp, Hook-

END OF TASK

6-6. SIDE DOOR ASSEMBLY MAINTENANCE.

This task covers:

- a. Installed Item Inspection b. Removal c. Cleaning
 d. Repair e. Installation
-

INITIAL SETUP

Applicable Configuration
 All

Equipment
 Condition
Para. Condition Description
 2-9 Equipment removed
 from compartment.

Test Equipment
 None

Special Environmental Conditions
 None

Special Tools
 Riveting Tool Set
 Drill, (Electric or
 Pneumatic)
 Set, Drill Bits

General Safety Instructions
 None

Materials/Parts
 Sealing Compound
 (Appendix E, item 8)

Personnel Required
 2 persons

a. Installed Item Inspection.

- (1) Inspect for loose or missing hardware.
- (2) Inspect hinge for rust, corrosion, damage, and loose fit to door.
- (3) Inspect gasket for damage, deterioration.
- (4) Inspect latches for rust, corrosion, damage, and loose fit to door.
- (5) Inspect hasps for rust, corrosion, damage, and loose fit to door.
- (6) Inspect door for damage, rust, and corrosion.

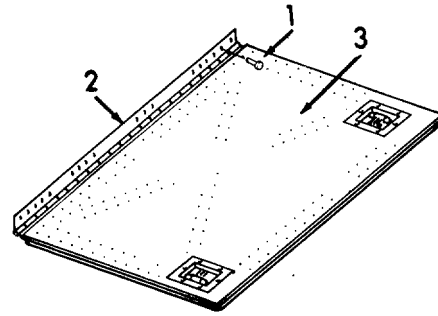
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6-6. SIDE DOOR ASSEMBLY MAINTENANCE - Continued.*b. Removal.* (Refer to Figure 6-5).

- (1) Drill out and remove rivets (1) that secure the door. Do not allow the door (3) to fall.
- (2) Remove the door assembly (2).

LEGEND:

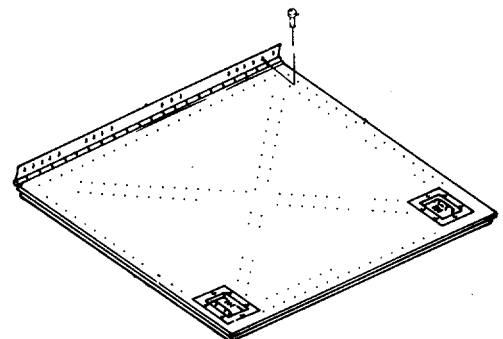
1. Rivet
2. Door Hinge
3. Door

**Figure 6-5. Side Door, Removal.***c. Cleaning.*

- (1) Clean the door with a solution of mild soap and water.
- (2) Rinse thoroughly with clean water.
- (3) Allow to dry.

d. Repair (Refer to Figures 6-6 through 6-10).

- (1) Replace a defective door (refer to Figure 6-6) as follows:
 - (a) Aline new door to rivet holes in existing hinge.
 - (b) Re-rivet.

**Figure 6-6. Hinge, Replacement.**

GO TO NEXT PAGE

6-6. SIDE DOOR ASSEMBLY MAINTENANCE - Continued.

d. Repair - Continued.

(2) Replace gasket (Refer to Figure 6-7) as follows:

- (a) Drill out and remove the rivets (1) securing the outside edge of the channel (2).
- (b) Remove the nuts (3), washers (4), screws (5), and gasket retainers (6).
- (c) Remove the gasket (7) and clean the gasket mounting area.

LEGEND:

- | | |
|------------|--------------------|
| 1. Rivet | 5. Screw |
| 2. Channel | 6. Gasket Retainer |
| 3. Nut | 7. Gasket |
| 4. Washer | 8. Door |

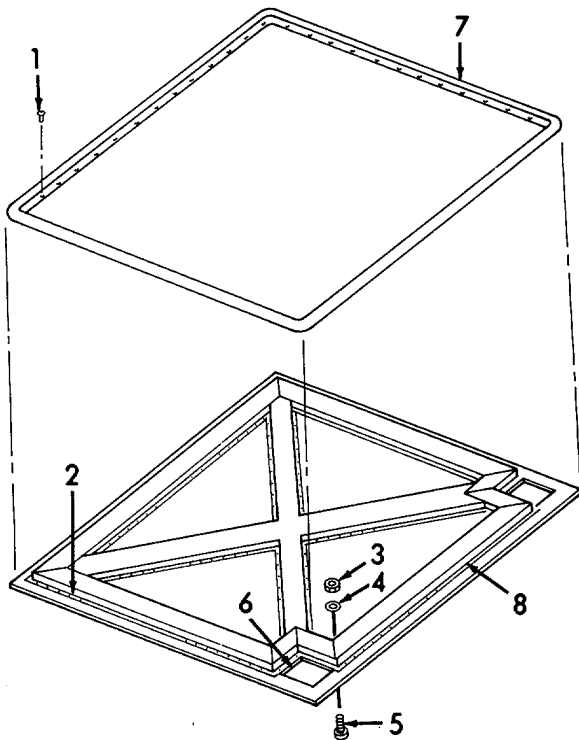


Figure 6-7. Gasket, Replacement.

- (d) Install new gasket (7) into position. Make sure gasket slips under outside edge of channel (2).
- (e) Install gasket retainers (6), screws (5), washers (4), and nuts (3). Tighten hardware securely.
- (f) Install rivets (1) using the rivet tool kit to secure channel (2) to door (8).

GO TO NEXT PAGE

6-6. SIDE DOOR ASSEMBLY MAINTENANCE - Continued.

d. Repair - Continued.

(3) Replacement of latches (Refer to Figure 6-8) as follows:

- (a) Remove six nuts (1), six washers (2), and screws (3).
- (b) Remove latch assembly (4) and scrape off old sealing compound.
- (c) Apply sealing compound (Appendix E, item 8) to the flange of the new latch (4).
- (d) Install new latch assembly (4) to door (5).
- (e) Install six screws (3), six washers (2), and six nuts (1).

LEGEND:

- 1. Nut
- 2. Washer
- 3. Screw
- 4. Latch Assembly
- 5. Door

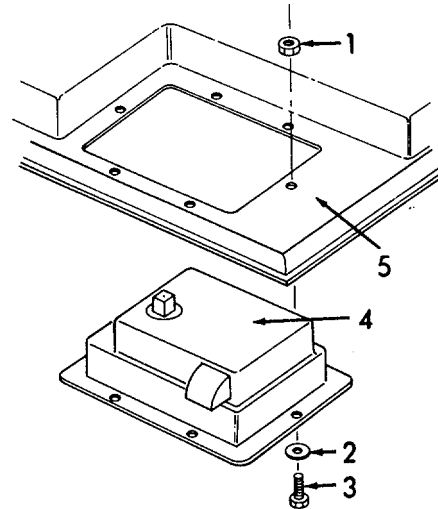


Figure 6-8. Latch Assembly, Replacement.

(4) Replace hasp (Refer to Figure 6-9) as follows:

- (a) Drill out and remove the four rivets (1) that secure the hasp (2) to the door (3).
- (b) Remove the hasp (2).
- (c) Install a new hasp (2) into position.
- (d) Install four new rivets (1) using the rivet tool kit to secure hasp (2) to door (3).

LEGEND:

- 1. Rivet
- 2. Hasp
- 3. Door

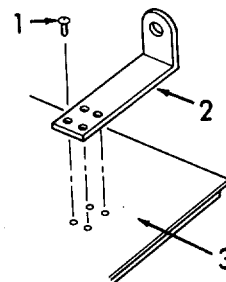


Figure 6-9. Hasp, Replacement.

GO TO NEXT PAGE

6-6. SIDE DOOR ASSEMBLY MAINTENANCE - Continued.

d. *Repair - Continued.*

(5) Replacement of stays (Refer to Figure 6-10) as follows:

LEGEND:

- | | |
|-----------|---------|
| 1. Nut | 4. Stay |
| 2. Washer | 5. Door |
| 3. Screw | |

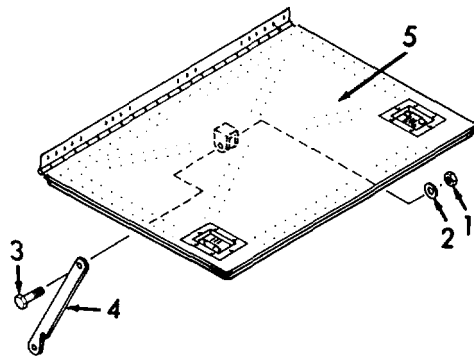


Figure 6-10. Stay, Replacement.

- (a) Remove nut (1), washer (2), and screw (3) that secures the stay (4) to the door (5).
- (b) Remove the stay (4).
- (c) Place stay (4) into position.
- (d) Install screw (3), washer (2), and nut (1) to secure stay (4) to door (5).

e. *Installation (Refer to Figure 6-11).*

LEGEND:

- | |
|----------|
| 1. Door |
| 2. Hinge |
| 3. Rivet |

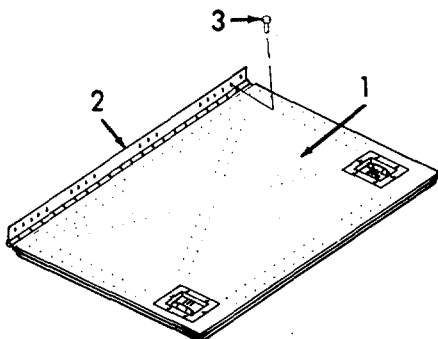


Figure 6-11. Side Door, Installation..

- (1) Place door (1) into place in closed position.
- (2) Secure hinge (2) to cabinet with rivets (3) using the rivet tool kit.

END OF TASK

6-7. REAR DOOR ASSEMBLY MAINTENANCE.

This task covers:

- a. Installed Item Inspection b. Removal c. Cleaning
 d. Repair e. Installation
-

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

Riveting Tool Set
 Drill, (Electric or
 Pneumatic)
 Set, Drill Bits

Materials/Parts

Sealing Compound
 (Appendix E, item 8)

Equipment
 Condition

<u>Para.</u>	<u>Condition Description</u>
2-9	Tailgate lowered.
2-9	Generator removed.

Special Environmental Conditions

None

General Safety Instructions

None

Personnel Required

2 persons

a. Installed Item Inspection.

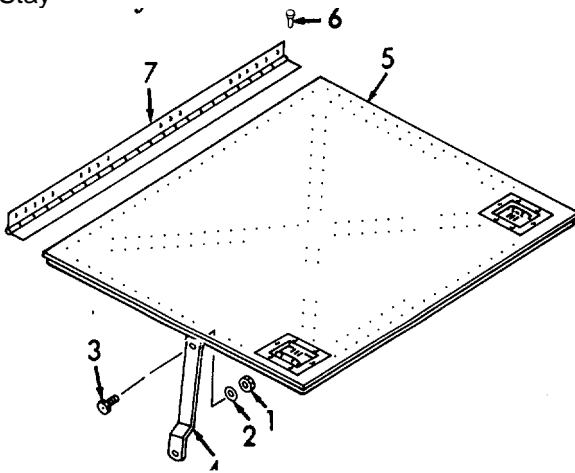
- (1) Inspect for loose or missing hardware.
- (2) Inspect hinge for rust, corrosion, damage, and loose fit to door.
- (3) Inspect gasket for damage, deterioration.
- (4) Inspect latches for rust, corrosion, damage, and loose fit to door.
- (5) Inspect hasps for rust, corrosion, damage, and loose fit to door.
- (6) Inspect door for damage, rust, and corrosion.

GO TO NEXT PAGE

6-7. REAR DOOR ASSEMBLY MAINTENANCE - Continued.*b. Removal (Refer to Figure 6-12).*

LEGEND:

- | | |
|-----------|----------|
| 1. Nut | 5. Door |
| 2. Washer | 6. Rivet |
| 3. Screw | 7. Hinge |
| 4. Stay | |

**Figure 6-12. Rear Door, Removal.***c. Cleaning.*

- (1) Clean the door with a solution of mild soap and water.
- (2) Rinse thoroughly with clean water.
- (3) Allow to dry.

d. Repair. Repair of the rear door is limited to the following:

- (1) Replacement of a defective gasket in accordance with paragraph 6-6d(2).
- (2) Replacement of a defective latch in accordance with paragraph 6-6d(3).
- (3) Replacement of a defective hasp in accordance with paragraph 6-6d(4).
- (4) Replacement of a defective stay in accordance with paragraph 6-6d(5).

GO TO NEXT PAGE

- (1) Remove nut (1), washer (2), and screw (3) that secures the stay(4) to the cabinet.
- (2) Swing the stay (4) away from cabinet.
- (3) Remove other stay per step (1) and (2) above.
- (4) Remove the rivets (6) that secure the door hinge (7) to the cabinet. Do not allow the door to fall.
- (5) Remove the door (5)

6-7. REAR DOOR ASSEMBLY MAINTENANCE - Continued.

e. *Installation (Refer to Figure 6-13).*

- (1) Place door (1) into place in closed position.
- (2) Secure hinge (2) to cabinet with rivets (3) using riveting tool kit.
- (3) Place stay (4) into position.
- (4) Install screw (5), washer (6), and nut (7) to secure stay (4) to door (1).
- (5) Repeat steps (3) and (4) above for other stay.

LEGEND:

- | | |
|----------|-----------|
| 1. Door | 4. Stay |
| 2. Hinge | 5. Screw |
| 3. Rivet | 6. Washer |
| | 7. Nut |

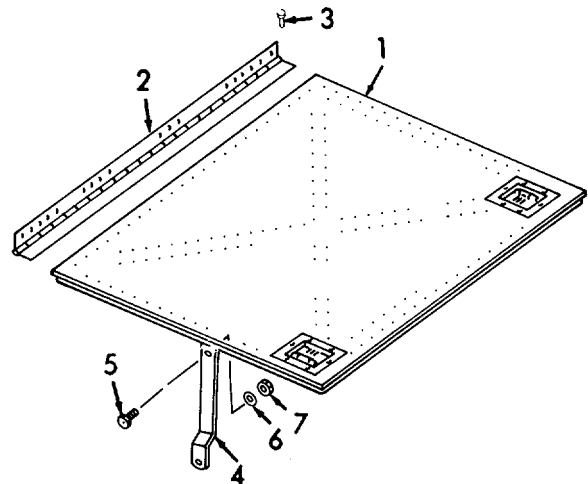


Figure 6-13. Side Door, Installation.

END OF TASK

6-8. HOLDDOWN CLAMP ASSEMBLY MAINTENANCE.

This task covers:

- | | | |
|------------------------------|------------|-----------------|
| a. Installed Item Inspection | b. Removal | c. Cleaning |
| d. Inspection | e. Repair | f. Installation |

INITIAL SETUP

Test Equipment

None

Special Tools

None

Materials/Parts

None

Personnel Required

2 persons

Equipment Condition

<u>Para.</u>	<u>Condition Description</u>
2-9	Table top removed.

Special Environmental Conditions

None

General Safety Instructions

None

GO TO NEXT PAGE

6-8. HOLDDOWN CLAMP ASSEMBLY MAINTENANCE - Continued.

a. Installed Item Inspection.

- (1) Inspect for loose or missing hardware.
- (2) Inspect for rust/corrosion and damage.

b. Removal (Refer to Figure 6-14).

LEGEND:

- | | |
|--------------|------------|
| 1. Pin | 6. Washer |
| 2. Bolt | 7. Plate |
| 3. Washer | 8. Screw |
| 4. Clamp Arm | 9. Bracket |
| 5. Nut | |

- (1) Remove pin (1), bolt (2), washer (3), and clamp arm (4).
- (2) Remove four nuts (5), four washers (6), and inside plate (7).
- (3) Remove four screws (8) and outside bracket (9).

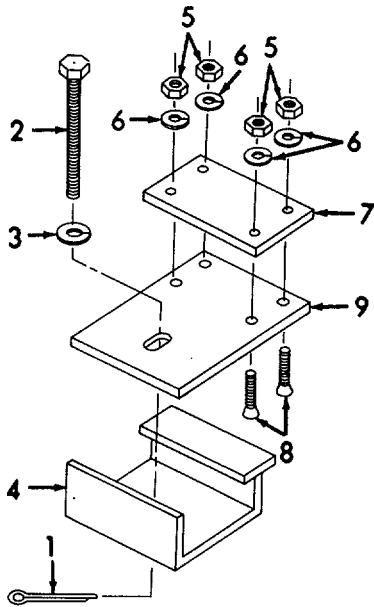


Figure 6-14. Holddown Clamp Assembly, Removal.

c. Cleaning.

- (1) Clean the holddown clamp assembly with a solution of mild soap and water.
- (2) Rinse thoroughly with clean water.
- (3) Allow to dry.

GO TO NEXT PAGE

6-8. HOLDDOWN CLAMP ASSEMBLY MAINTENANCE - Continued.

d. Inspection.

- (1) Inspect for loose, missing, or damaged hardware.
- (2) Inspect for rust/corrosion and damage.
- (3) Inspect for damaged threads and elongated holes.
- (4) Inspect for damaged welds.

e. Repair. Repair is limited to the replacement of damaged parts.

f. Installation (Refer to Figure 6-15).

LEGEND:

- (1) Place outside bracket (1) and inside plate (2) into position.
- (2) Install four screws (3), four washers (4), and four nuts (5).
- (3) Install clamp arm (6), washer (7), and bolt (8).
- (4) Install pin (9).

- 1. Bracket
- 2. Plate
- 3. Screw
- 4. Washer
- 5. Nut
- 6. Clamp Arm
- 7. Washer
- 8. Bolt
- 9. Pin

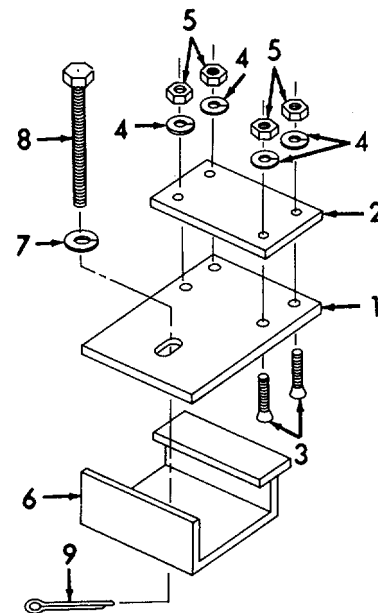


Figure 6-15. Holddown Clamp Assembly, Installation.

END OF TASK

6-9. GENERATOR TRACK AND HOLDDOWN ASSEMBLY.

This task covers:

- | | | |
|------------------------------|------------|-----------------|
| a. Installed Item Inspection | b. Removal | c. Cleaning |
| d. Inspection | e. Repair | f. Installation |

INITIAL SETUP

Applicable Configuration

All

Equipment Condition

<u>Para.</u>	<u>Condition Description</u>
6-5	Cabinet removed from trailer

Test Equipment

None

Special Environmental Conditions

None

Special Tools

None

General Safety Instructions

None

Materials/Parts

None

Personnel Required

2 persons

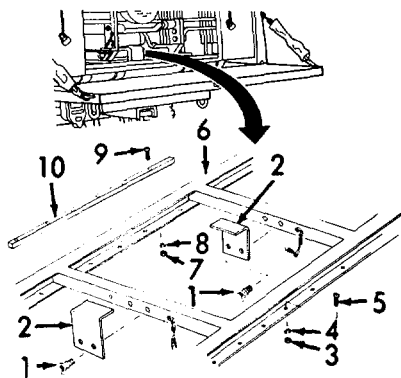
a. Installed Item Inspection.

- (1) Inspect for loose or missing hardware.
- (2) Inspect for cracks, broken parts, rust, and corrosion.

b. Removal (Refer to Figure 6-16).

LEGEND:

- | | |
|---------------|---------------|
| 1. Wingbolt | 6. Track |
| 2. Holddown | 7. Nut |
| 3. Nut | 8. Lockwasher |
| 4. Lockwasher | 9. Screw |
| 5. Bolt | 10. Bar |



- (1) Remove four wingbolts (1).
- (2) Remove two holddowns (2).
- (3) Remove thirty-six nuts (3), thirty-six lockwashers (4), and thirty-six bolts (5).
- (4) Remove track (6).
- (5) Remove six nuts (7), six lockwashers (8), six screws (9), and bar (10). Repeat for other bar.

Figure 6-16. Generator Track and Holddown Assembly, Removal.

GO TO NEXT PAGE

6-9. GENERATOR TRACK AND HOLDDOWN ASSEMBLY - Continued.

c. Cleaning.

- (1) Wash the generator track and holddown assembly with a solution of mild soap and water.
- (2) Rinse thoroughly with clean water.
- (3) Allow to dry.

d. Inspection.

- (1) Inspect for missing or damaged hardware.
- (2) Inspect holddowns for cracks, elongated holes, and rust/corrosion.
- (3) Inspect track for cracks, elongated holes, and rust/corrosion.
- (4) Inspect bar for cracks, elongated holes, rust/corrosion.

e. Repair. Repair of the generator track and holddown assembly is limited to the straightening of bent parts and the welding of broken parts.

f. Installation (Refer to Figure 6-17).

- (1) Place bar (1) into position on generator track (2), Secure with six screws (3), six washers (4), and six nuts (5). Repeat for other bar.
- (2) Install track (2).
- (3) Install thirty-six screws (6), thirty-six washers (7), and thirty-six nuts (8).
- (4) Install two holddowns (9). Secure with four wingbolts (10).

LEGEND:

- | | |
|-----------|--------------|
| 1. Bar | 6. Screw |
| 2. Track | 7. Washer |
| 3. Screw | 8. Nut |
| 4. Washer | 9. Holddown |
| 5. Nut | 10. Wingbolt |

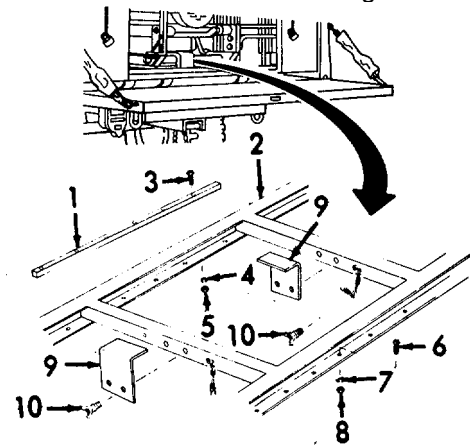


Figure 6-17. Generator Track and Holddown Assembly, Installation.

END OF TASK

6-10. POWER CABLE MAINTENANCE.

This task covers:

- a. Installed Item Inspection
- b. Removal
- c. Cleaning
- d. Inspection
- e. Repair
- f. Installation

INITIAL SETUP

Applicable Configuration

All

Equipment
Condition

Para.

Condition Description

Cables not connected.

Test Equipment

Multimeter

Special Environmental Conditions

None

Special Tools

None

Materials/Parts

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Disconnect the power cable from all equipment prior to beginning any cleaning.

a. Installed Item Inspection.

- (1) Inspect for broken wires, cracked or frayed insulation, and burnt or charred insulation.
- (2) Inspect junction boxes for cracks, dents, holes, corrosion, and signs of burning or charring.
- (3) Inspect all parts for proper connection.
- (4) Perform a continuity test using the multimeter.

b. Removal. Removal of the power cable is accomplished by paragraph 2-9.

c. Cleaning.

WARNING

Disconnect the power cable from all equipment prior to beginning any cleaning.

GO TO NEXT PAGE

6-10. POWER CABLE MAINTENANCE - Continued.*c. Cleaning - Continued.*

- (1) Remove all dirt, debris, etc. by wiping with a cloth that is dampened with water.
- (2) Allow to dry.

d. Inspection.

- (1) Inspect for broken wires, cracked or frayed insulation, and burnt or charred insulation.
- (2) Inspect junction boxes for cracks, dents, holes, corrosion, and signs of burning or charring.
- (3) Inspect all parts for proper connection.

e. Repair. Repair is by replacement of the cable or junction boxes.

- (1) To replace the cable (wiring), remove all junction boxes per step (2), then place junction boxes on new cable per step (2).
- (2) To replace any junction box, refer to the schematics (Figures 6-18 through 6-20) and proceed as follows:
 - (a) Remove all screws from the box cover and remove cover.
 - (b) Tag and disconnect all internal wiring to the receptacles.
 - (c) Unscrew the nut from the watertight connector.
 - (d) Remove the cable from the box and then remove the nut from the cable.
 - (e) Inspect the hardware, terminals, and the wires for damage.
 - (f) Install nut over cable and insert cable into box.
 - (g) Connect the wiring to the receptacles per the schematics (Figures 6-18 through 6-20).
 - (h) Screw the nut securely to the watertight connector.
 - (i) Install the cover and all screws. Be sure that all screws are tight.

GO TO NEXT PAGE

6-10. POWER CABLE MAINTENANCE - Continued.

f. Installation. Installation of the power cable is accomplished by paragraph 2-9.

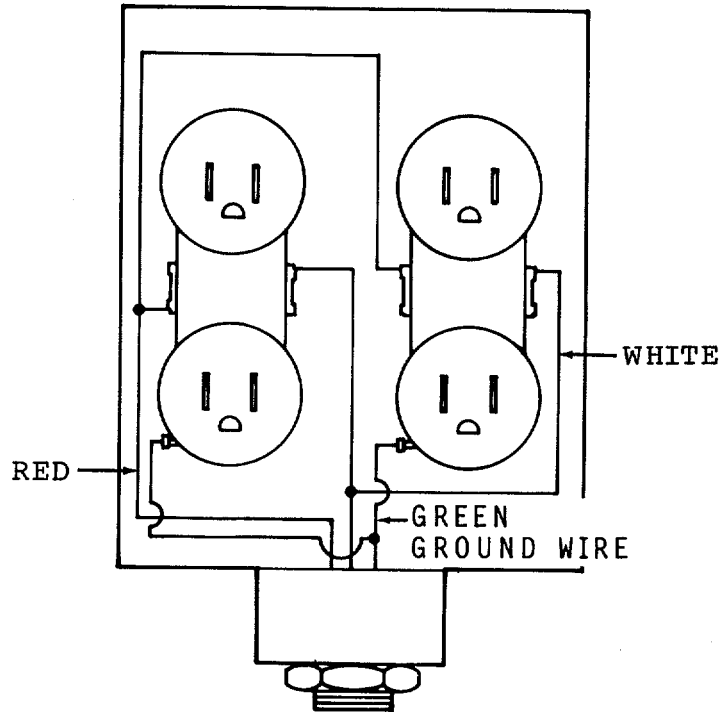


Figure 6-18. Four-receptacle Junction Box Schematic.

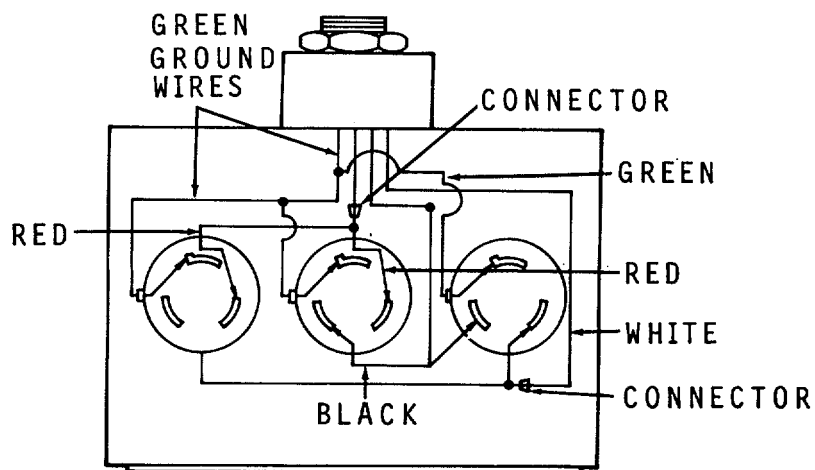


Figure 6-19. Three-receptacle Junction Box Schematic.

GO TO NEXT PAGE

6-10. POWER CABLE MAINTENANCE - Continued.

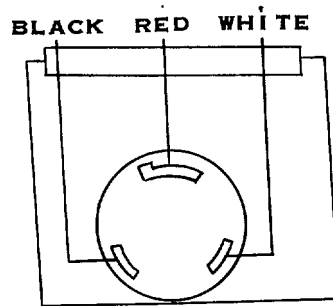


Figure 6-20. Male Connector Schematic.

SECTION III. MAINTENANCE OF CLOTHING SEWING MACHINE

	Para.		Para.
Bed and Arm Maintenance	6-20	Machine Timing.....	6-26
Bobbin Assembly Maintenance	6-19	Presser Bar and Needle Bar Maintenance	6-22
Electric Motor Maintenance.....	6-27	Pulley Maintenance	6-15
Face Plate and Thread Tensioner Maintenance	6-13	Thread Guides Maintenance.....	6-12
Feed Regulator Control Maintenance	6-16	Top Cover and Arm Oil System Maintenance.....	6-14
General	6-11	Upper Feed Assembly Maintenance	6-21
Lifting Lever Shaft Maintenance.....	6-23	Upper Shaft Maintenance	6-24
Lower Feed Assembly Maintenance	6-18	Vertical Shaft Maintenance.....	6-25
Lower (Bed) Lubricating Oil System Maintenance	6-17		

6-11. GENERAL.

This section contains information on the removal, disassembly, cleaning, inspection, repair, assembly, installation, and adjustment of the various parts of the clothing sewing machine.

END OF TASK

6-12. THREAD GUIDES MAINTENANCE.

This task covers:

- | | | | |
|------------|----------------|-----------------|---------------|
| a. Removal | b. Disassembly | c. Cleaning | d. Inspection |
| e. Repair | f. Assembly | g. Installation | |

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

- Cleaning Solvent
(Appendix E, item 2)
- Cloth, Soft, Lint-Free
(Appendix E, item 3)
- Brush, Medium Bristle
(Appendix E, item 1)

Equipment
Condition

<u>Para.</u>	<u>Condition Description</u>
2-12	Electrical power removed.
2-12	Needle and thread removed.

Special Environmental Conditions
None

Personnel Required
1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

a. Removal (Refer to Figures 6-21 and 6-22).

LEGEND:

- 1. Locknut
- 2. Guide Pin

- (1) Refer to Figure 6-21. Loosen locknut (1).
- (2) Unscrew and remove needle guide pin (2).

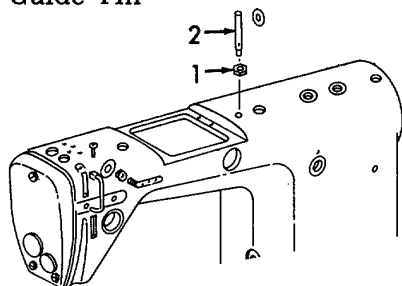


Figure 6-21. Needle Thread Guide, Removal.

GO TO NEXT PAGE

6-12. THREAD GUIDES MAINTENANCE - Continued.

a. Removal - Continued.

LEGEND:

- 1. Screw
- 2. Take-Up Lever Cover
- 3. Screw
- 4. Frame Thread Guide
- 5. Locknut
- 6. Eyelet

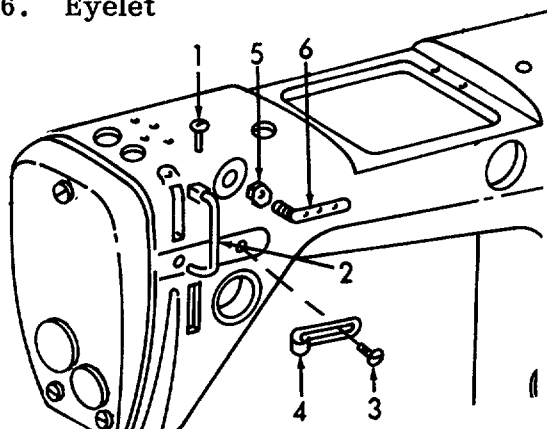


Figure 6-22. Thread Guides, Removal.

- (3) Refer to Figure 6-22. Remove screw (1).
- (4) Remove thread take-up lever cover (2).
- (5) Remove screw (3).
- (6) Remove frame thread guide (4).
- (7) Loosen locknut (5).
- (8) Remove thread eyelet (6).
- (9) Remove locknut (5).

b. Disassembly (Refer to Figure 6-23).

LEGEND:

- 1. Locknut
- 2. Pin
- 3. Screw
- 4. Spring
- 5. Front Tension Disc
- 6. Rear Tension Disc

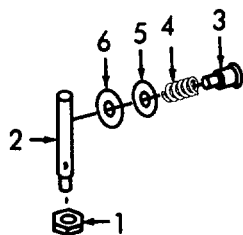


Figure 6-23. Needle Thread Guide, Disassembly.

- (1) Remove locknut (1) from pin (2).
- (2) Remove screw (3) and spring (4).
- (3) Remove the front tension disc (5) and the rear tension disc (6).

GO TO NEXT PAGE

6-12. THREAD GUIDES MAINTENANCE - Continued.*c. Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

d. Inspection.

- (1) Inspect hardware for damage.
- (2) Inspect the thread take-up lever cover for damage.
- (3) Inspect the frame thread guide for damage.
- (4) Inspect the thread eyelet for damage.
- (5) Inspect for stripped or otherwise damaged threads.
- (6) Inspect for broken spring.
- (7) Inspect for burred or otherwise damaged tension discs.

- e. Repair.* Repair of the thread guides is limited to the replacement of defective components.

GO TO NEXT PAGE

6-12. THREAD GUIDES MAINTENANCE - Continued.

f. *Assembly (Refer to Figure 6-24).*

- (1) Install spring (1) to screw (2).
- (2) Install front tension disc (3) and rear tension disc (4) to the screw (2).
- (3) Install the screw (2) to the pin (5).
- (4) Install the locknut (6) to the pin (5).

LEGEND:

1. Spring
2. Screw
3. Front Tension Disc
4. Rear Tension Disc
5. Pin
6. Locknut

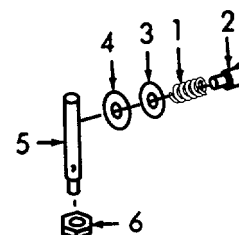


Figure 6-24. Needle Thread Guide, Assembly.

g. *Installation (Refer to Figures 6-25 and 6-26).*

- (1) Install locknut (1) to thread eyelet (2).
- (2) Install thread eyelet (2) and tighten locknut (1).
- (3) Install frame thread guide (3) and secure with screw (4).
- (4) Install thread take-up lever cover (5) and secure with screw (6).

LEGEND:

1. Locknut
2. Eyelet
3. Thread Guide
4. Screw
5. Take-Up Lever Cover
6. Screw

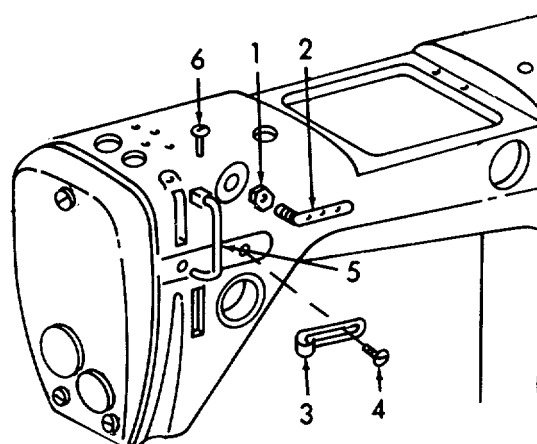


Figure 6-25. Thread Guides, Installation.

GO TO NEXT PAGE

6-12. THREAD GUIDES MAINTENANCE - Continued.

g. Installation - Continued.

LEGEND:

- 1. Guide Pin
- 2. Locknut

- (1) Refer to Figure 6-26. Install guide pin (1) into position.
- (2) Tighten locknut (2).

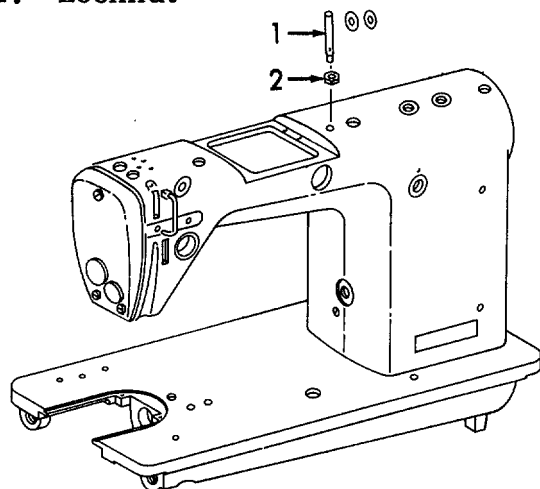


Figure 6-26. Needle Thread Guide, Installation.

END OF TASK

6-13. FACE PLATE AND THREAD TENSIONER MAINTENANCE.

This task covers:

- | | | | |
|------------|----------------|-----------------|---------------|
| a. Removal | b. Disassembly | c. Cleaning | d. Inspection |
| e. Repair | f. Assembly | g. Installation | |

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Equipment Condition

Para.

2-12

Condition Description

Electrical power removed.

Needle and thread removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

a. Removal (Refer to Figures 6-27 and 6-28).

- (1) Refer to Figure 6-27. Remove three screws (1).
- (2) Remove face plate (2) and gasket (3).
- (3) Discard gasket (3).

LEGEND:

- | | |
|---------------|-----------|
| 1. Screw | 3. Gasket |
| 2. Face Plate | |

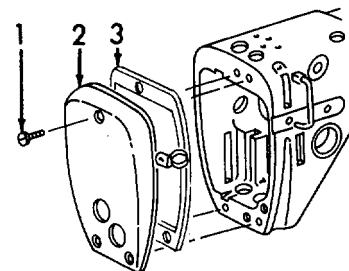


Figure 6-27. Face Plate, Removal.

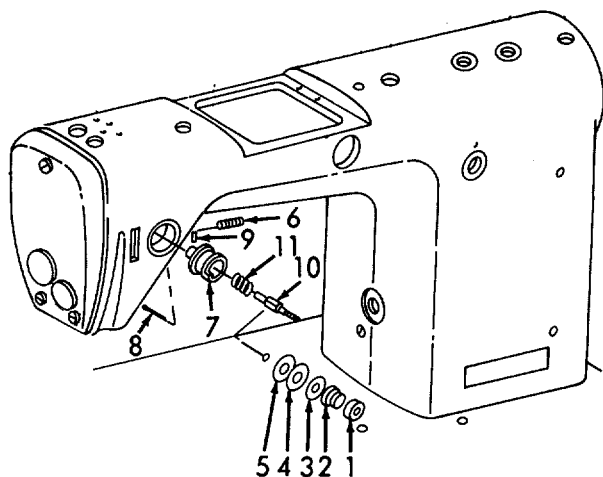
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6-13. FACE PLATE AND THREAD TENSIONER MAINTENANCE - Continued.

a. Removal - Continued.

LEGEND:

- | | |
|---------------------------|-------------|
| 1. Tension Adjustment Nut | 6. Setscrew |
| 2. Spring | 7. Bushing |
| 3. Tension Disc Presser | 8. Pin |
| 4. Tension Disc | 9. Setscrew |
| 5. Tension Disc | 10. Post |
| | 11. Spring |



- (4) Refer to Figure 6-28. Remove tension nut (1) and spring (2).
- (5) Remove tension disc presser (3) and two tension discs (4 and 5).
- (6) Remove setscrew (6).
- (7) Remove Bushing (7).

NOTE

Push bushing out from rear.

- (8) Remove pin (8).



Be careful when removing the spring.

- (9) Loosen two setscrews (9) and remove post (10) and spring (11).

Figure 6-28. Thread Tension Adjuster, Removal.

b. Disassembly (Refer to Figure 6-29).

LEGEND:

- | | |
|----------|-----------------|
| 1. Plug | 3. Thread Guide |
| 2. Screw | |

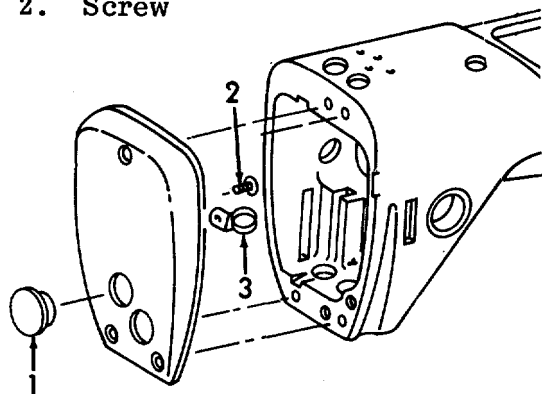


Figure 6-29. Face Plate, Disassembly.

- (1) Remove two rubber plugs (1).
- (2) Remove screw (2) and thread guide (3).

GO TO NEXT PAGE

6-13. FACE PLATE AND THREAD TENSIONER MAINTENANCE - Continued.*c. Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

d. Inspection.

- (1) Inspect hardware for damage.
- (2) Inspect the springs for damage.
- (3) Inspect the pin for damage.
- (4) Inspect the bushing for damage.
- (5) Inspect the disc presser for damage.
- (6) Inspect the tension discs for damage.
- (7) Inspect the post for damage.
- (8) Inspect face plate for damage.
- (9) Inspect thread guide for damage.
- (10) Inspect the rubber plugs for deterioration and damage.

- e. Repair.* Repair of the face plate and thread tensioner is limited to the replacement of defective components.

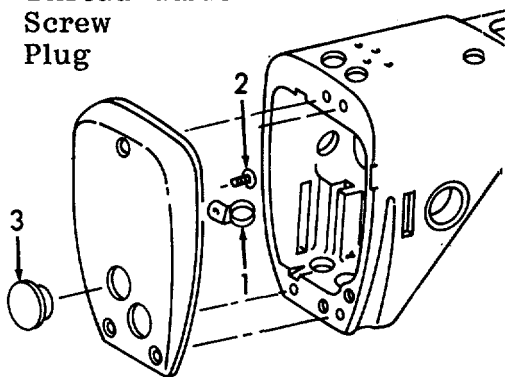
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6-13. FACE PLATE AND THREAD TENSIONER MAINTENANCE - Continued.

f. Assembly (Refer to Figure 6-30).

LEGEND:

- 1. Thread Guide
- 2. Screw
- 3. Plug

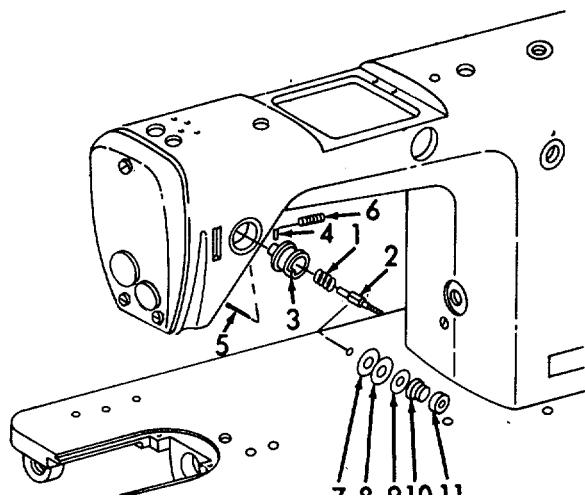


- (1) Install thread guide (1) and secure with screw (2).
- (2) Install two rubber plugs (3).

Figure 6-30. Face Plate, Assembly.

g. Installation (Refer to Figures 6-31 and 6-32).

- | | |
|-------------|--------------------|
| 1. Spring | 7. Tension Disc |
| 2. Post | 8. Tension Disc |
| 3. Bushing | 9. Presser |
| 4. Setscrew | 10. Spring |
| 5. Pin | 11. Adjustment Nut |
| 6. Setscrew | |



- (1) Refer to Figure 6-31. Install the spring (1) and post (2) into the bushing (3). Be sure the end of the spring rides in the slot of the post.
- (2) Tighten the two setscrews (4).
- (3) Install pin (5) through the rear of the bushing (3).
- (4) Install the bushing (3) into the housing. Be sure the spring rests in the notch in the face of the bushing and the notch faces to the left.
- (5) Install and tighten the setscrew (6).
- (6) Install the two tension discs (7 and 8). Be sure the hollow sides of the discs are away from each other.

Figure 6-31. Thread Tension Adjuster, Installation.

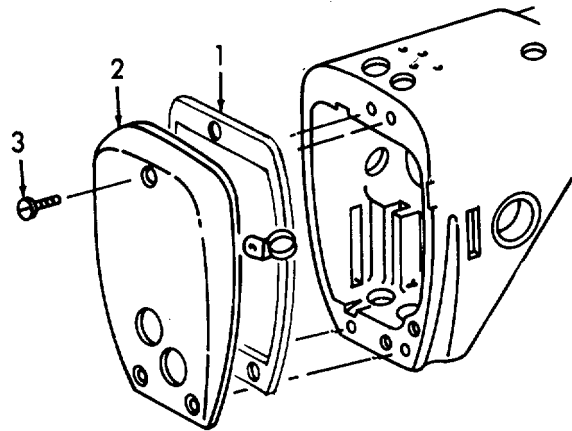
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6-13. FACE PLATE AND THREAD TENSIONER MAINTENANCE - Continued.*g. Installation - Continued.*

- (7) Install the presser (9). Be sure the recessed side is towards the tension discs.
- (8) Install the spring (10) with the large end towards the presser.
- (9) Install the tension adjustment nut (11).
- (10) Refer to Figure 6-32. Place a new gasket (1) into position.
- (11) Install face plate (2) and secure with three screws (3).

LEGEND:

- 1. Gasket
- 2. Face Plate
- 3. Screw

**Figure 6-32. Face Plate, Installation.**

END OF TASK

6-14. TOP COVER AND ARM OIL SYSTEM MAINTENANCE.

This task covers:

- a. Removal b. Cleaning c. Inspection d. Repair
 e. Installation
-

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Gasket, Cover

Gasket, Oil Line (2 required)

Equipment
Condition

Para.

2-12

Condition Description

Electrical power
removed.

2-12

Needle and thread
removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-14. TOP COVER AND ARM OIL SYSTEM MAINTENANCE - Continued.

a. *Removal (Refer to Figures 6-33 through 6-35).*

- (1) Refer to Figure 6-33. Remove two screws (1).
- (2) Remove top cover (2).
- (3) Remove rubber plug (3).

LEGEND:

- 1. Screw
- 2. Top Cover
- 3. Rubber Plug

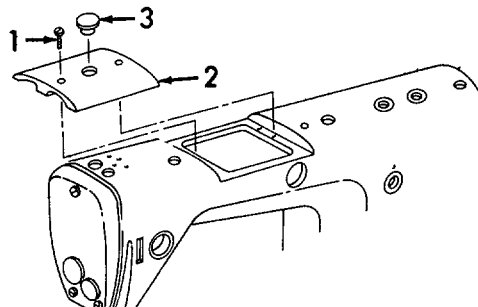


Figure 6-33. Top Cover, Removal.

- (4) Refer to Figure 6-34. Remove four screws (1), two clamps (2), and two oil wicks (3) from top of cover (4).
- (5) Remove cover (4) and gasket (5). Discard gasket (5).
- (6) Use a clean rag and soak up all oil in the reservoir.
- (7) Remove two screws (6) and reservoir (7) and then disconnect two oil lines from bottom of reservoir.
- (8) If required, remove two connectors (8) and two gaskets (9). Discard gasket (9).

LEGEND:

- 1. Screw
- 2. Clamp
- 3. Oil Wick
- 4. Cover
- 5. Gasket
- 6. Screw
- 7. Reservoir
- 8. Connector
- 9. Gasket

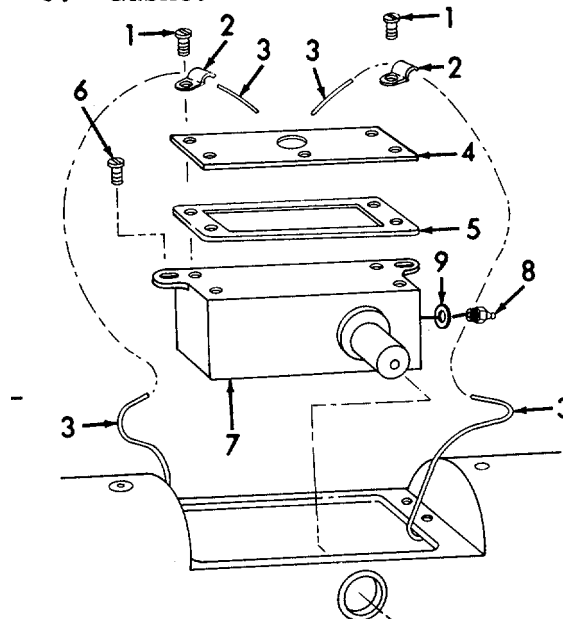


Figure 6-34. Upper (Arm) Oil Reservoir, Removal.

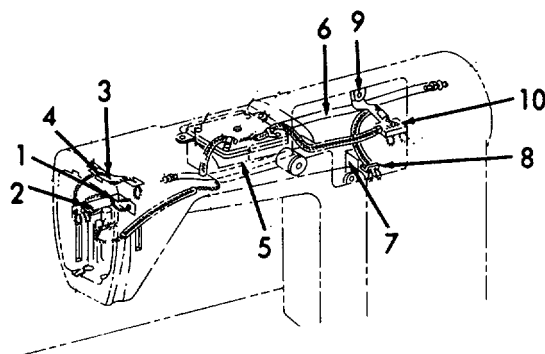
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6-14. TOP COVER AND ARM OIL SYSTEM MAINTENANCE - Continued.

a. Removal - Continued.

LEGEND:

- | | |
|-------------|-------------|
| 1. Screw | 6. Oil Wick |
| 2. Bracket | 7. Screw |
| 3. Screw | 8. Bracket |
| 4. Bracket | 9. Screw |
| 5. Oil Wick | 10. Bracket |



- (9) Refer to Figure 6-35. Remove screw (1) and bracket (2).
- (10) Remove screw (3) and bracket (4).
- (11) Remove oil wick (5).
- (12) Remove oil wick (6).
- (13) Remove screw (7) and bracket (8).
- (14) Remove screw (9) and bracket (10).
- (15) If required, remove connectors and gaskets. Discard gaskets

Figure 6-35. Upper (Arm) Oil Lubricating System, Removal.

b. Cleaning.

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

GO TO NEXT PAGE

6-14. TOP COVER AND ARM OIL SYSTEM MAINTENANCE - Continued.

c. Inspection.

- (1) Inspect hardware for damage.
- (2) Inspect top cover for damage.
- (3) Inspect rubber plug for deterioration and damage.
- (4) Inspect the reservoir and cover for damage.

d. Repair. Repair of the top cover and arm oil system is limited to replacement of defective parts.

e. Installation (Refer to Figures 6-36 and 6-38).

- (1) Refer to Figure 6-36. If removed, install new gaskets and then connectors.
- (2) Install bracket (1) and screw (2).
- (3) Install bracket (3) and screw (4).
- (4) Install oil wick (5) to connectors.
- (5) Install oil wick (6) to connectors.
- (6) Install bracket (7) and screw (8).
- (7) Install bracket (9) and screw (10).

LEGEND:

- | | |
|-------------|-------------|
| 1. Bracket | 6. Oil Wick |
| 2. Screw | 7. Bracket |
| 3. Bracket | 8. Screw |
| 4. Screw | 9. Bracket |
| 5. Oil Wick | 10. Screw |

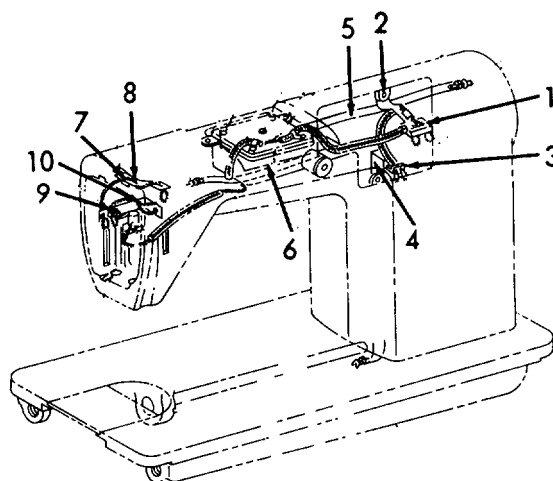


Figure 6-36. Upper (Arm) Lubricating Oil System, Installation.

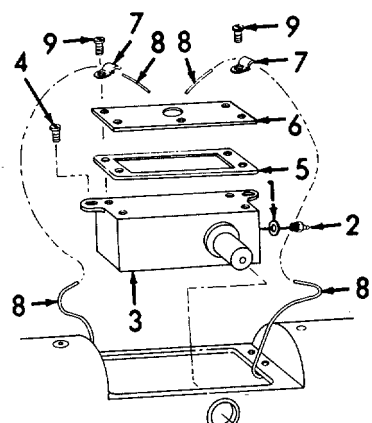
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6-14. TOP COVER AND ARM OIL SYSTEM MAINTENANCE - Continued.

e. Installation - Continued.

LEGEND:

- | | |
|--------------|-------------|
| 1. Gasket | 6. Cover |
| 2. Connector | 7. Clamp |
| 3. Reservoir | 8. Oil Wick |
| 4. Screw | 9. Screw |
| 5. Gasket | |

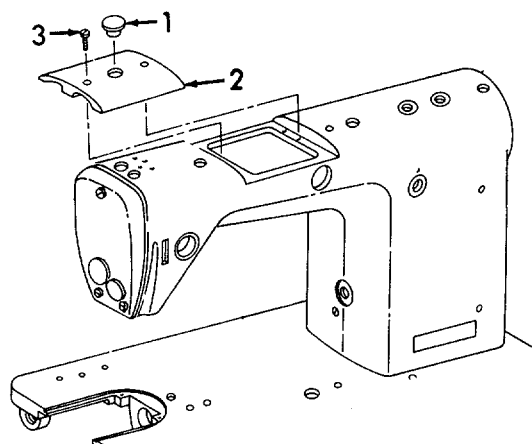


- (8) Refer to Figure 6-37. Install two new gaskets (1) and two connectors (2).
- (9) Connect two oil lines to bottom of reservoir (3).
- (10) Install reservoir (3) into position.
- (11) Install two screws (4).
- (12) Install new gasket (5) and cover (6).
- (13) Place the two clamps (7) into position over the oil wicks (8).
- (14) Install the four screws (9) to secure the clamps and the cover.
- (15) Refill the reservoir with clean oil.

Figure 6-37. Upper (Arm) Oil Reservoir, Installation.

LEGEND:

- 1. Plug
- 2. Top Cover
- 3. Screw



- (16) Refer to Figure 6-38. Install rubber plug (1) into position.
- (17) Install top cover (2) into position.
- (18) Install two screws (3).

Figure 6-38. Top Cover, Installation.

END OF TASK

6-15. PULLEY MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

- Cleaning Solvent
(Appendix E, item 2)
- Cloth, Soft, Lint-Free
(Appendix E, item 3)
- Brush, Medium Bristle
(Appendix E, item 1)

Equipment Condition

<u>Para.</u>	<u>Condition Description</u>
2-12	Electrical power removed.
2-12	Needle and thread removed.
2-9	Sewing machine head removed from table.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

a. Removal (Refer to Figure 6-39).

- (1) Remove pulley capscrew (1).
- (2) Loosen but do not remove two setscrews (2).
- (3) Slide the pulley (3) off the pulley shaft.

LEGEND:

- 1. Capscrew
- 2. Setscrew
- 3. Pulley

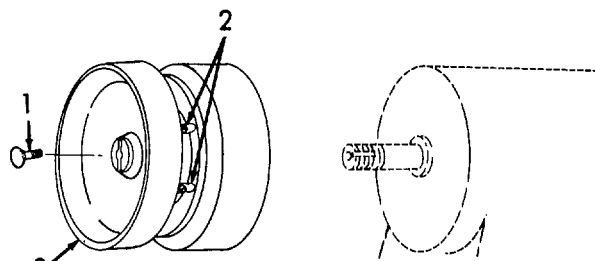


Figure 6-39. Pulley, Removal.

6-15. PULLEY MAINTENANCE - Continued.

b. Cleaning.

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).

- (3) Allow to dry.

c. Inspection.

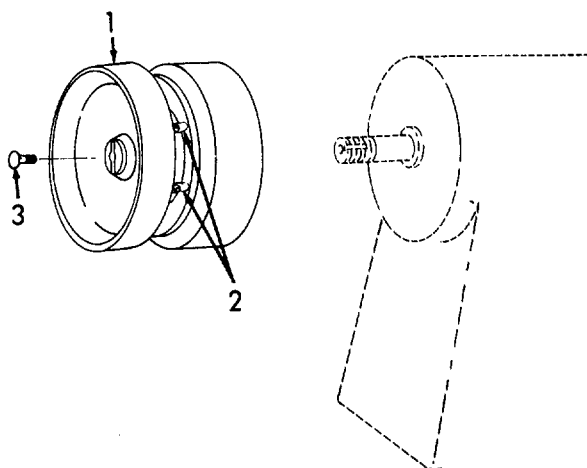
- (1) Inspect hardware for damage.
- (2) Inspect pulley for damage.

d. Repair. No repair of the pulley is authorized.

e. Installation (Refer to Figure 6-40).

LEGEND:

- | | |
|-------------|-------------|
| 1. Pulley | 3. Capscrew |
| 2. Setscrew | |



- (1) Slide the pulley (1) into position on the shaft. Be sure that the setscrews are aligned with the grooves in the shaft.
- (2) Tighten the setscrews (2).
- (3) Install the pulley capscrew (1).

Figure 6-40. Pulley, Installation.

END OF TASK

6-16. FEED REGULATOR CONTROL MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Packing, Preformed (2 required)

Equipment
Condition

Para.

2-12

Condition Description

Electrical power
removed.

2-12

Needle and thread
removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

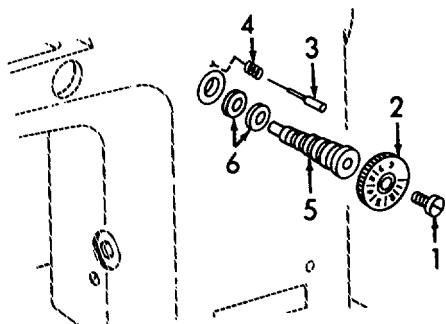
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6-16. FEED REGULATOR CONTROL MAINTENANCE -Continued.

a. *Removal (Refer to Figure 6-41).*

LEGEND:

- | | |
|------------------|----------------------|
| 1. Screw | 4. Spring |
| 2. Control Dial | 5. Regulator |
| 3. Regulator Pin | 6. Preformed Packing |
| 4. Spring | |



- (1) Remove screw (1).
- (2) Remove regulator control dial (2).
- (3) Remove feed regulator pin (3) and spring (4).
- (4) Remove stitch length regulator (5).
- (5) Remove and discard two preformed packings (6).

Figure 6-41. Feed Regulator Control, Removal.

b. *Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

c. *Inspection.*

- (1) Inspect hardware for damage.
- (2) Inspect the regulator control dial and stitch length regulator screw for damage.
- (3) Inspect the feed regulator pin and spring for damage.

GO TO NEXT PAGE

6-16. FEED REGULATOR CONTROL MAINTENANCE -Continued.

- d. *Repair.* Repair of the feed regulator control is limited to the replacement of defective parts.
- e. *Installation (Refer to Figure 6-42).*

- (1) Install two new preformed packings (1).
- (2) Install stitch length regulator (2). Turn the regulator (2) in as far as it will go with out being forced.
- (3) Install feed regulator spring (3) and pin (4).
- (4) Install regulator control dial (5) and screw (6). Set the numeral "1" directly on top of the pin (4).

LEGEND:

- 1. Preformed Packing
- 2. Regulator
- 3. Regulator Spring
- 4. Pin
- 5. Dial
- 6. Screw

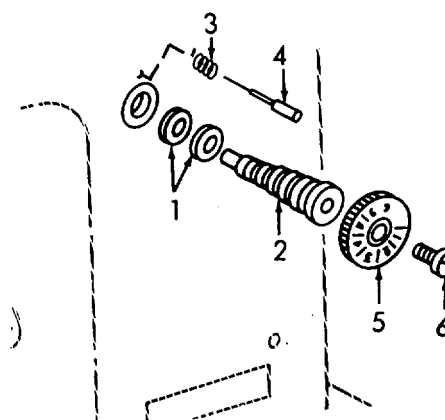


Figure 6-42. Feed Regulator Control, Installation.

END OF TASK

6-17. LOWER (BED) LUBRICATING OIL SYSTEM MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Gasket, Oil Line (4 required)

Gasket Cover

Equipment
Condition

Para.

2-12

Condition Description

Electrical power
removed.

2-12

Needle and thread
removed.

2-9

Sewing machine removed
from table.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-17. LOWER (BED) LUBRICATING OIL SYSTEM MAINTENANCE - Continued.

a. Removal (Refer to Figure 6-43).

- (1) Remove oil line (1) from both connectors (2) and allow oil to drain.
- (2) Remove the other oil line (4) from both connectors (2).
- (3) If required, remove four connectors (2) and four gaskets (5). Discard the gaskets (5).
- (4) Remove four screws (6).
- (5) Remove cover (7) and gasket (8). Discard gasket (8).

LEGEND:

- | | |
|--------------|------------|
| 1. Oil Line | 5. Gaskets |
| 2. Connector | 6. Screw |
| 3. Reservoir | 7. Cover |
| 4. Oil Line | 8. Gasket |

LEGEND:

- | | |
|--------------|------------|
| 1. Oil Line | 5. Gaskets |
| 2. Connector | 6. Screw |
| 3. Reservoir | 7. Cover |
| 4. Oil Line | 8. Gasket |

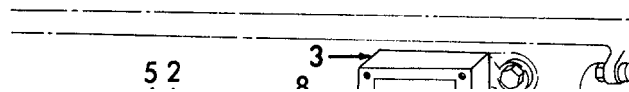


Figure 6-43. Lower (Bed) Lubricating Oil System, Removal.

b. Cleaning.

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

GO TO NEXT PAGE

6-17. LOWER (BED) LUBRICATING OIL SYSTEM MAINTENANCE - Continued.

c. Inspection.

- (1) Inspect hardware for damage.
- (2) Inspect the oil lines for damage.
- (3) Inspect the connectors for damage.
- (4) Inspect the cover for damage.

d. Repair. Repair of the lower (bed) lubricating oil system is limited to the replacement of defective parts.

e. Installation (Refer to Figure 6-44).

LEGEND:

- | | |
|-----------|--------------|
| 1. Gasket | 5. Connector |
| 2. Cover | 6. Oil Line |
| 3. Screw | 7. Oil Line |
| 4. Gasket | |

- (1) Install new gasket (1), cover (2), and secure with four screws (3).
- (2) Install four new gaskets (4) and four connectors (5).
- (3) Install oil line (6) and oil line (7).
- (4) Reinstall sewing machine into cabinet and refill lower reservoir with oil.

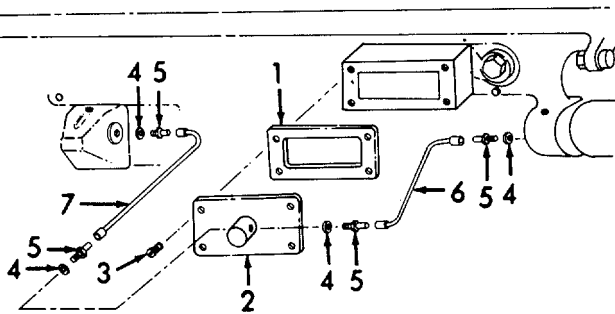


Figure 6-44. Lower (Bed) Lubricating Oil System, Installation.

END OF TASK

6-18. LOWER FEED ASSEMBLY MAINTENANCE.

This task covers:

- | | | | |
|------------|----------------|-----------------|---------------|
| a. Removal | b. Disassembly | c. Cleaning | d. Inspection |
| e. Repair | f. Assembly | g. Installation | |

INITIAL SETUP

<u>Applicable Configuration</u> All	Equipment Condition <u>Para.</u> 2-12	<u>Condition Description</u> Electrical power removed.
<u>Test Equipment</u> None	2-12	Needle and thread removed.
<u>Special Tools</u> None	2-9	Sewing machine head removed from table
	2-12	Bobbin removed.
<u>Materials/Parts</u> Cleaning Solvent (Appendix E, item 2)	<u>Special Environmental Conditions</u> None	
Cloth, Soft, Lint-Free (Appendix E, item 3)	<u>Personnel Required</u> 1 Person	
Brush, Medium Bristle (Appendix E, item 1)		

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

a. Removal (Refer to Figures 6-45 through 6-49).

- (1) Refer to Figure 6-45. Remove slide cover (1) by sliding the cover (1) off the bed.
- (2) Remove two screws (2).
- (3) Remove throat plate cover (3).

LEGEND:

- | | |
|-----------------------|------------------------|
| 1. Slide Cover | 3. Throat Plate |
| 2. Screw | |

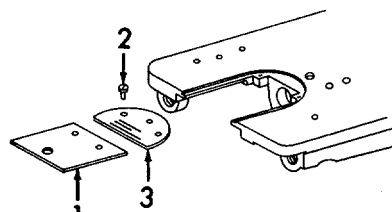


Figure 6-45. Slide and Throat Plates, Removal.

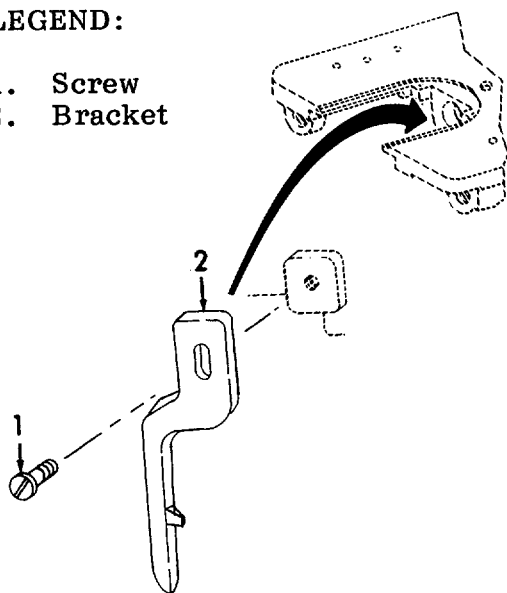
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6-18. LOWER FEED ASSEMBLY MAINTENANCE - Continued.

a. Removal - Continued.

LEGEND:

- 1. Screw
- 2. Bracket

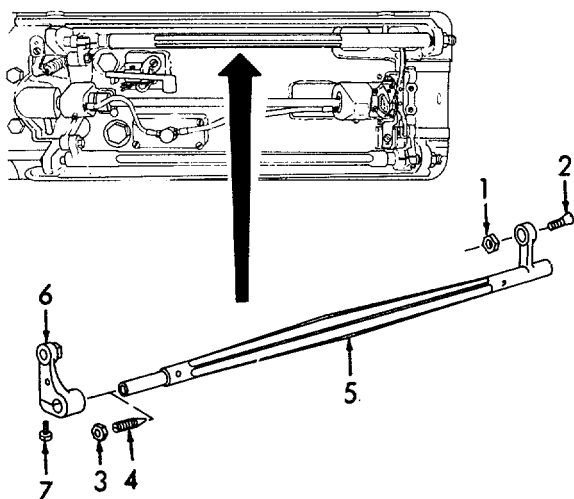


- (4) Lay the machine head on its side and support with a block of wood.
- (5) Refer to Figure 6-46. Remove screw (1).
- (6) Remove bobbin case positioning bracket (2).

Figure 6-46. Bobbin Case Positioning Bracket, Removal.

LEGEND:

- 1. Nut
- 2. Screw
- 3. Locknut
- 4. Shaft Centering Screw
- 5. Shaft
- 6. Locknut
- 7. Lockscrew



- (7) Refer to Figure 6-47. Remove nut (1) and screw (2).
- (8) Loosen the locknut (3) on both of the shaft centering screws.
- (9) Remove the shaft centering screws (4).
- (10) Rotate the shaft (5) slightly to disengage the driving crank (6) from the feed bar.
- (11) Remove the shaft (5).

Figure 6-47. Feed Rock Shaft, Removal.

GO TO NEXT PAGE

6-18. LOWER FEED ASSEMBLY MAINTENANCE - Continued.

a. Removal - Continued.

- (12) If the drive crank (6) is to be removed, slightly score the shaft with a scribing tool to mark the location and position of the crank.
- (13) Loosen the lockscrew (7) and remove the drive crank.
- (14) Refer to Figure 6-48. Loosen the locknut (1) on both the shaft centering screws (2).
- (15) Remove the nut (3) and the screw (4).

LEGEND:

- | | |
|--------------------|----------------|
| 1. Locknut | 4. Screw |
| 2. Centering Screw | 5. Shaft |
| 3. Nut | 6. Drive Crank |
| | 7. Lockscrew |

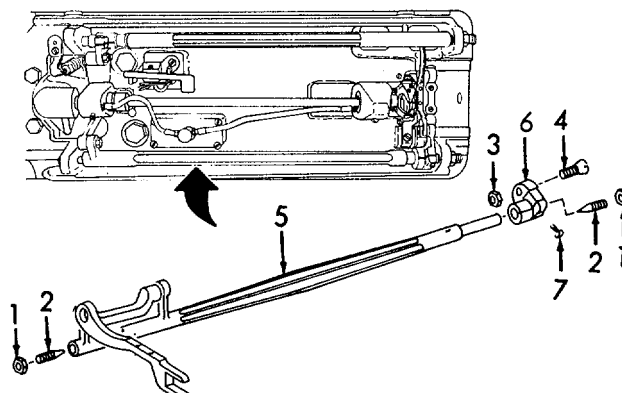


Figure 6-48. Feed Lifting Hook Shaft, Removal.

- (16) Remove both shaft centering screws (2).
- (17) Rotate the shaft (5) slightly to remove the shaft.
- (18) If the drive crank (6) is to be removed, slightly score the shaft with a scribing tool to mark the location and position of the crank.
- (19) Loosen the lockscrew (7) and remove the drive crank (6).

- (20) Refer to Figure 6-49. Loosen both locknuts (1) on the feed bar centering screws (2).
- (21) Remove the feed bar centering screws (2) and the feed bar (3).
- (22) Remove two screws (4) and feed dog (5).

LEGEND:

- | | |
|--------------------|-------------|
| 1. Locknut | 3. Feed Bar |
| 2. Centering Screw | 4. Screw |
| | 5. Feed Dog |

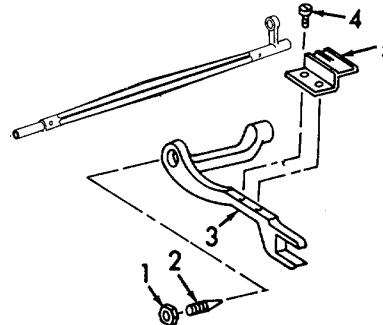


Figure 6-49. Feed Bar, Removal.

GO TO NEXT PAGE

6-18. LOWER FEED ASSEMBLY MAINTENANCE - Continued.

b. *Disassembly (Refer to Figure 6-50).*

LEGEND:

1. Screw
2. Spring
3. Slide Plate

(1) Remove two screws (1).

(2) Remove spring (2) from slide plate (3).

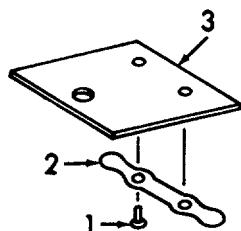


Figure 6-50. Slide Plate, Disassembly.

c. *Cleaning.*

(1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

(2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).

(3) Allow to dry.

d. *Inspection.*

(1) Inspect slide and throat plates for damage.

(2) Inspect hardware for damage.

(3) Inspect slide plate spring for damage.

(4) Inspect the shafts and drive cranks for damage.

(5) Inspect the feed bar and feed dog for damage.

GO TO NEXT PAGE

6-18. LOWER FEED ASSEMBLY MAINTENANCE - Continued.

e. *Repair.* Repair is limited to the replacement of defective parts.

f. *Assembly (Refer to Figure 6-51).*

(1) Place spring (1) into position.

(2) Install two screws (2).

LEGEND:

- 1. Spring
- 2. Screw

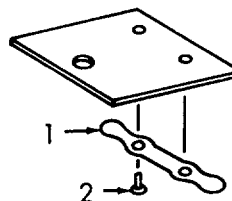


Figure 6-51. Slide Plate, Assembly.

g. *Installation (Refer to Figures 6-52 through 6-56).*

(1) Refer to Figure 6-52. Install feed dog (1) and secure with two screws (2).

(2) Install feed bar (3) into position and then install feed bar centering screws (4).

(3) Tighten the feed bar centering screws (4) until the end play on the feed bar is gone and the feed bar can still move freely.

(4) Tighten the locknuts (5) and then recheck the end play and feed bar movement.

LEGEND:

- 1. Feed Dog
- 2. Screw
- 3. Feed Bar
- 4. Centering Screw
- 5. Locknut

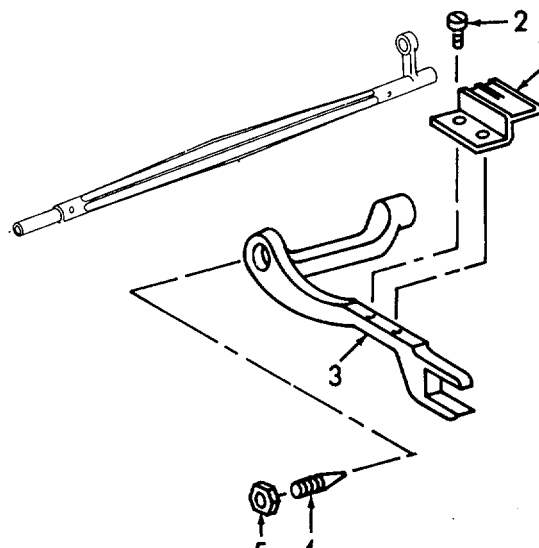


Figure 6-52. Feed Bar, Installation.

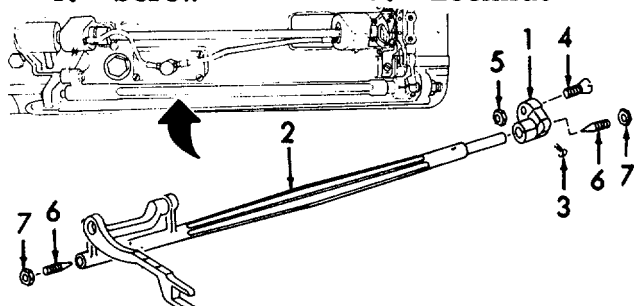
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6-18. LOWER FEED ASSEMBLY MAINTENANCE - Continued.

g. Installation - Continued.

LEGEND:

- | | |
|----------------|--------------------|
| 1. Drive Crank | 5. Nut |
| 2. Shaft | 6. Centering Screw |
| 3. Lockscrew | 7. Locknut |
| 4. Screw | |



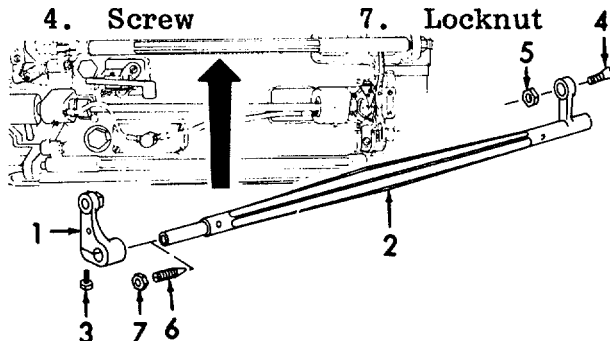
- (5) Refer to Figure 6-53. If the drive crank (1) was removed, install the drive crank (1) on the shaft (2) using the scribe marks as guides for installation.
- (6) Tighten the lockscrew (3).
- (7) Install the shaft (2) into position.
- (8) Install the screw (4) and nut (5). Check for free movement of the shaft against the arm.

Figure 6-53. Feed Lifting Hook Shaft, Installation.

- (9) Install both shaft centering screws (6). Tighten the shaft centering screws (6) until the end play on the shaft is gone but the shaft still moves freely.
- (10) Tighten the locknuts (7). Recheck the shaft end play and shaft rotation.
- (11) Temporarily install the feed plate.
- (12) Check that feed dog is centered in the slots. Adjust by loosening or tightening nuts (7) and shaft centering screws (6). Be sure to recheck for free movement of the shaft but with out any end play.

LEGEND:

- | | |
|----------------|--------------------|
| 1. Drive Crank | 5. Nut |
| 2. Shaft | 6. Centering Screw |
| 3. Lockscrew | 7. Locknut |
| 4. Screw | |



- (13) Refer to Figure 6-54. If the drive crank (1) was removed, install the drive crank (1) on the shaft (2) using the scribe marks as guides for installation.
- (14) Tighten the lockscrew (3).
- (15) Install the shaft (2) into position. Be sure the feed drive sliding block is mated with the slot in the feed bar.

Figure 6-54. Feed Rock Shaft, Installation.

GO TO NEXT PAGE

6-18. LOWER FEED ASSEMBLY MAINTENANCE - Continued.

g. Installation - Continued.

- (16) Install the screw (4) and nut (5). Check for free movement of the shaft against the arm.
- (17) Install both shaft centering screws (6). Tighten the shaft centering screws (6) until the end play on the shaft is gone but the shaft still moves freely.
- (18) Tighten the locknuts (7). Recheck the shaft end play and shaft rotation.

(19) Refer to Figure 6-55. Install the bobbin case positioning bracket (1) so that the bracket nib (2) catches the slot in the rotary hook.

(20) Install the screw (2).

LEGEND:

- 1. Bracket
- 2. Nib
- 3. Screw

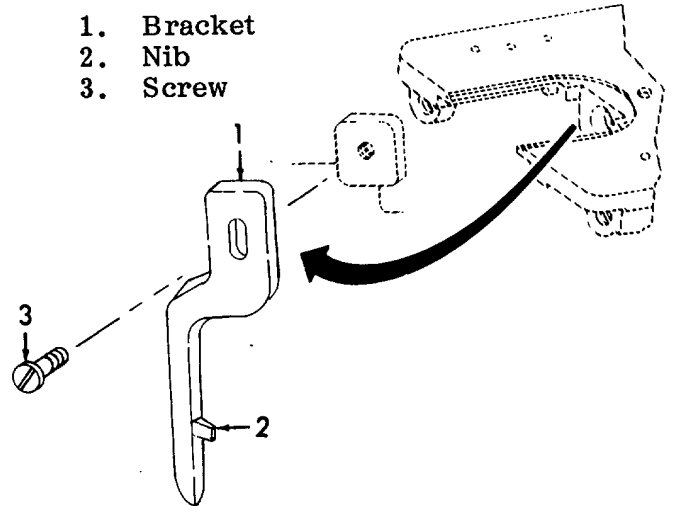


Figure 6-55. Bobbin Case Positioning Bracket, Installation.

(21) Refer to Figure 6-56. Place throat plate (1) into position.

(22) Install two screws (2).

(23) Install the slide cover (3) by sliding the cover into position.

LEGEND:

- 1. Throat Plate
- 2. Screw
- 3. Slide Cover

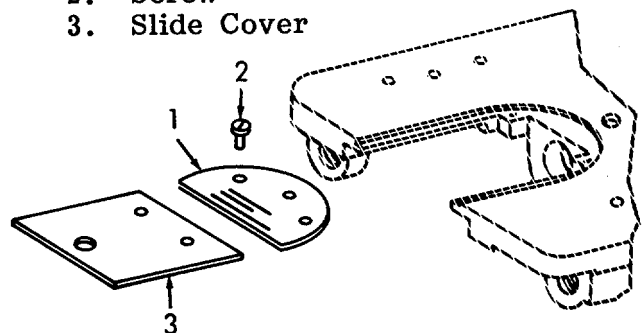


Figure 6-56. Slide and Throat Cover, Installation.

END OF TASK

6-19. BOBBIN ASSEMBLY MAINTENANCE.

This task covers:

- a. Removal
 - b. Cleaning
 - c. Inspection
 - d. Repair
 - e. Installation
-

INITIAL SETUP

	Equipment Condition	
<u>Applicable Configuration</u>	<u>Para.</u>	<u>Condition Description</u>
All	2-12	Electrical power removed.
<u>Test Equipment</u>	2-12	Needle and thread removed.
None	2-9	Sewing machine removed from table.
<u>Special Tools</u>	6-18a	Slide and throat plates removed.
None		
<u>Materials/Parts</u>	<u>Special Environmental Conditions</u>	
Cleaning Solvent (Appendix E, item 2)	None	
Cloth, Soft, Lint-Free (Appendix E, item 3)		
Brush, Medium Bristle (Appendix E, item 1)	<u>Personnel Required</u>	
Grease (Appendix E, item 4)	1 Person	

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-19. BOBBIN ASSEMBLY MAINTENANCE - Continued .

a. Removal (Refer to Figures 6-57 through 6-59).

- (1) Lay machine on side and support with a block of wood.
- (2) Refer to Figure 6-57. Pull on the clip and remove the bobbin case (1).
- (3) Remove the bobbin (2).
- (4) Loosen the three set- screws (3) and remove the rotary hook assembly (4).

LEGEND:

- 1. Bobbin Case
- 2. Bobbin
- 3. Setscrew
- 4. Rotary Hook

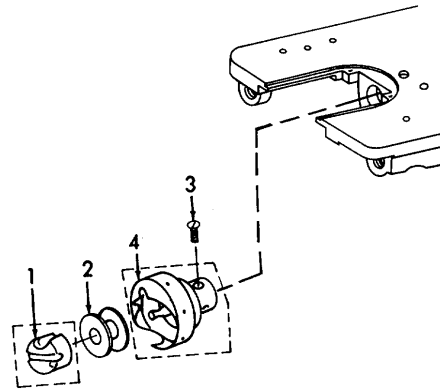


Figure 6-57. Bobbin Case Assembly, Removal.

- (5) Refer to Figure 6-58. Remove the screw (1) and remove both halves of the gear case (2).
- (6) Loosen the two setscrews (3).
- (7) Slide the shaft (4) out of the pinion gear (5) and remove the pinion gear.

LEGEND:

- 1. Screw
- 2. Gear Case
- 3. Pinion Gear
- 4. Shaft
- 5. Setscrew

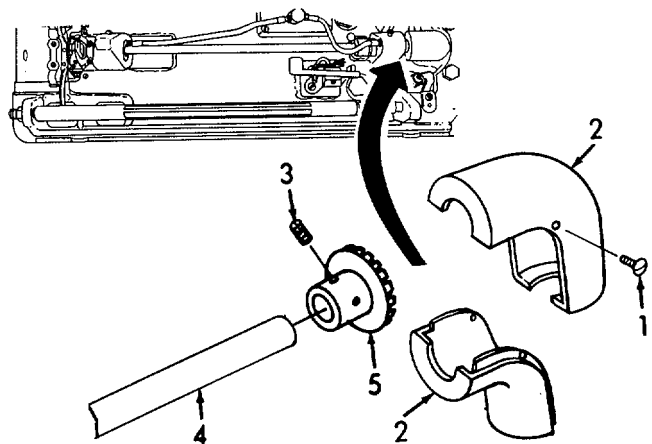


Figure 6-58. Bobbin Drive Gear, Removal.

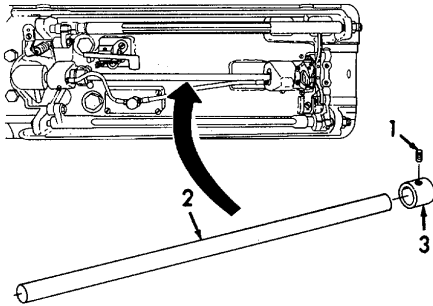
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6-19. BOBBIN ASSEMBLY MAINTENANCE - Continued.

a. Removal - Continued.

LEGEND:

- 1. Setscrew
- 2. Shaft
- 3. Thrust Collar



- (8) Refer to Figure 6-59. Loosen two setscrews (1).
- (9) Slide the shaft (2) out of the rear bushing.
- (10) Remove the thrust collar (3).
- (11) Remove the shaft (2).

Figure 6-59. Bobbin Drive Shaft, Removal.

b. Cleaning.

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 3) and either a soft, clean cloth (Appendix E, item 2) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

c. Inspection.

- (1) Inspect hardware for damage.
- (2) Inspect the shaft for damage.
- (3) Inspect the pinion gear for damage.
- (4) Inspect the gear case for damage.

GO TO NEXT PAGE

6-19. BOBBIN ASSEMBLY MAINTENANCE - Continued.

c. Inspection - Continued.

- (5) Inspect the bobbin case and rotary hook assembly for damage.
- (6) Inspect the thrust collar for damage.

d. Repair. Repair of the bobbin assembly components is limited to the replacement of defective parts.

e. Installation (Refer to Figures 6-60 and 6-61).

NOTE

Remove burrs from all parts to ensure a good fit.

- (1) Refer to Figure 6-60. Install the shaft (1) through the front bushing with the flat on the shaft towards the rear.
- (2) Slip on the thrust collar (2). Do not tighten the setscrews at this time.
- (3) Slide the shaft (1) into the rear bushing.
- (4) Slide pinion gear (3) onto shaft (2). Be sure that the pinion gear (3) mates with the other pinion gear (4).
- (5) Move shaft (1) until the shaft end is flush with the end of the pinion gear (3). Tighten the pinion gear setscrews (5).

LEGEND:

- | | |
|------------------|--------------|
| 1. Shaft | 5. Setscrew |
| 2. Thrust Collar | 6. Setscrew |
| 3. Pinion Gear | 7. Gear Case |
| 4. Pinion Gear | 8. Screw |

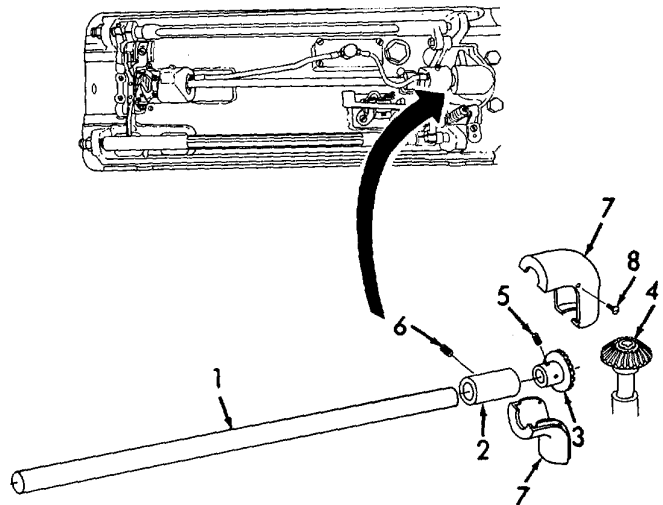


Figure 6-60. Bobbin Drive Shaft and Gears, Installation.

- (6) Slide the thrust collar (2) against the rear bushing. Move the shaft back and forth until the pinion gear (3) moves freely while still in mesh with the other pinion gear.

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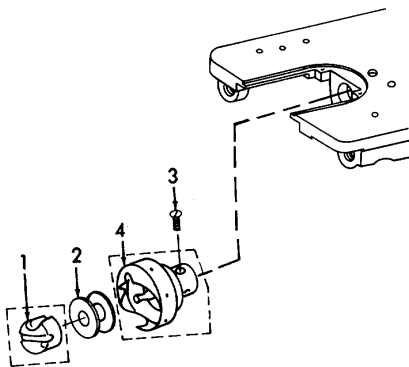
6-19. BOBBIN ASSEMBLY MAINTENANCE - Continued .

e. Installation - Continued.

- (7) Tighten the thrust collar setscrews (6).
- (8) Pack the gear case (7) with grease (Appendix E, item 4) and then install both gear case (7) halves.
- (9) Install the screw (8).
- (10) Rotate the gear case until the pinion gears are not binding against the case.

LEGEND:

- | | |
|----------------|----------------|
| 1. Bobbin Case | 3. Setscrew |
| 2. Bobbin | 4. Rotary Hook |



- (11) Refer to Figure 6-61. With the needle bar fully up, install the rotary hook assembly (1) into position with the rotary hook point "A" at the bottom.
- (12) Tighten the three setscrews (2).
- (13) Install the bobbin (3).
- (14) Install the bobbin case (4).
- (15) Time the sewing machine in accordance with paragraph 6-49.

Figure 6-61. Bobbin Case Assembly, Installation.

END OF TASK

6-20. BED AND ARM MAINTENANCE .

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Equipment
Condition

Para.

2-12

Condition Description

Electrical power removed.

2-12

Needle and thread removed.

2-9

Sewing machine removed from table.

6-18

Lower feed assembly removed.

6-19

Bobbin assembly removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

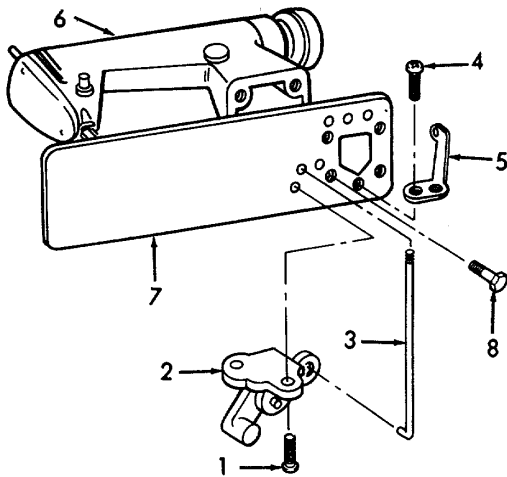
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6-20. BED AND ARM MAINTENANCE - Continued.

a. *Removal (Refer to Figure 6-62).*

LEGEND:

- | | |
|----------------|------------|
| 1. Screw | 5. Bracket |
| 2. Crank Lever | 6. Arm |
| 3. Rod | 7. Bed |
| 4. Screw | 8. Bolt |



- (1) Remove two screws (1) and crank lever (2).
- (2) Loosen nut and remove rod (3).
- (3) Remove screw (4) and bracket (5).
- (4) Support the arm (6) and the bed (7) on wood blocks.
- (5) Remove four bolts (8).
- (6) Use a soft mallet and tap the bed gently to drive the bed off the arm. Do not remove the dowel pins unless they are damaged.

Figure 6-62. Bed and Arm, Disassembly.

b. *Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

GO TO NEXT PAGE

6-20. BED AND ARM MAINTENANCE - Continued.

c. Inspection.

- (1) Inspect hardware for damage.
- (2) Inspect the bed for damage.
- (3) Inspect the arm case for damage.
- (4) Inspect the crank lifter for damage.
- (5) Inspect the rod for damage.
- (6) Inspect the bracket for damage.

d. Repair. Repair of the bed and arm is limited to the replacement of defective parts.

e. Installation (Refer to Figure 6-63).

- (1) Place the bed (1) into position on the arm (2).
- (2) Use a soft mallet to seat the bed on the arm.
- (3) Install four bolts (3).
- (4) Install bracket (4) and screw (5). (5) Install rod (6).
- (6) Install crank lever (7) and secure with two screws (8).

LEGEND:

- | | |
|------------|----------|
| 1. Bed | 5. Screw |
| 2. Arm | 6. Rod |
| 3. Bolt | 7. Lever |
| 4. Bracket | 8. Screw |

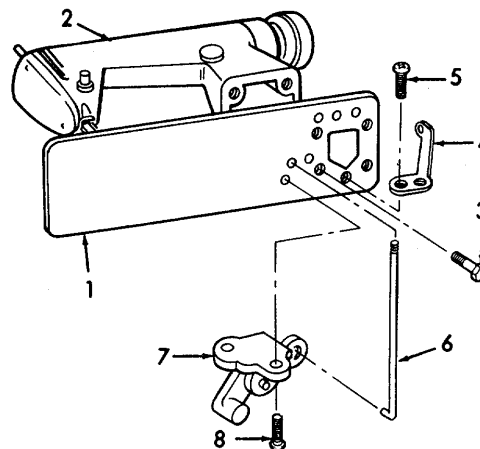


Figure 6-63. Bed and Arm, Assembly.

END OF TASK

6-21. PRESSER BAR AND NEEDLE BAR MAINTENANCE .

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

- Cleaning Solvent
(Appendix E, item 2)
- Cloth, Soft, Lint-Free
(Appendix E, item 3)
- Brush, Medium Bristle
(Appendix E, item 1)

Equipment
Condition

Para.

Condition Description

- 2-12 Electrical power removed.
- 2-12 Needle and thread removed.
- 6-13 Face plate removed.
- 6-18 Slide and throat plates removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-21. PRESSER BAR AND NEEDLE BAR MAINTENANCE - Continued.

a. Removal (Refer to Figures 6-64 and 6-65).

LEGEND:

- | | |
|--------------------------|---------------------|
| 1. Screw | 9. Guide Bracket |
| 2. Presser Foot | 10. Presser Bar |
| 3. Thread Cutter | 11. Nut |
| 4. Regulator | 12. Pin |
| 5. Spring | 13. Lifter Lever |
| 6. Setscrew | 14. Pin |
| 7. Thread Regu-
lator | 15. Release Lever |
| 8. Setscrew | 16. Spring |
| | 17. Screw |
| | 18. Link |
| | 19. Lifting Bracket |

- (1) Refer to Figure 6-64. Remove the screw (1) and the presser foot (2).
- (2) Remove the thread cutter (3).
- (3) Carefully unscrew and remove the regulator (4) and then remove the spring (5).
- (4) Loosen the setscrew (6) and remove the slack thread regulator (7).
- (5) Loosen the setscrew (8), securing the guide bracket (9) to the presser bar (10).
- (6) Remove the nut (11), pin (12), and lifter lever (13).
- (7) Use a drift and drive out the pin (14). Remove the tension release lever (15) and the spring (16).
- (8) Remove the screw (17) and the link (18).
- (9) Remove the presser bar (10) from the guide bracket (9). If the lifting bracket (19) is seized to the presser bar, a brass drift may be used to drive the needle bar out of the bushings and the brackets.

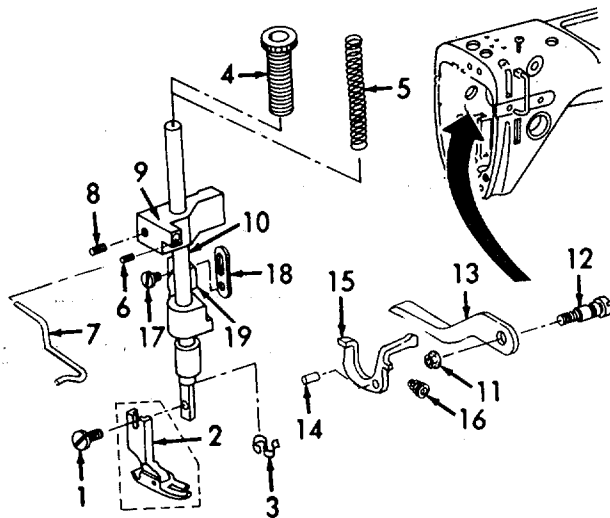


Figure 6-64. Presser Bar, Removal.

GO TO NEXT PAGE

6-21. PRESSER BAR AND NEEDLE BAR MAINTENANCE - Continued.

a. Removal - Continued.

- (10) Refer to Figure 6-65. Loosen the setscrew (1) and remove the needle clamp (2).
- (11) Remove the thread guide (3).
- (12) Remove the setscrew (4).
- (13) Loosen the setscrew (5) and slide out the needle bar (6).
- (14) Remove the connecting stud (7) and the slide block (8).
- (15) Remove the oil wick retainer (9) and the attached oil wick (if required).

LEGEND:

- | | |
|-----------------|--------------------|
| 1. Setscrew | 6. Needle Bar |
| 2. Needle Clamp | 7. Connecting Stud |
| 3. Thread Guide | 8. Slide Block |
| 4. Setscrew | 9. Retainer |
| 5. Setscrew | |

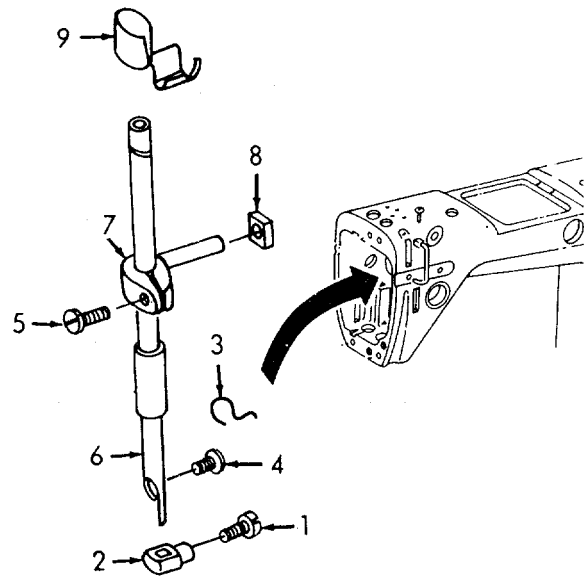


Figure 6-65. Needle Bar, Removal

b. Cleaning.

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).

- (3) Allow to dry.

GO TO NEXT PAGE

6-21. PRESSER BAR AND NEEDLE BAR MAINTENANCE - Continued.*c. Inspection.*

- (1) Inspect hardware for damage.
- (2) Inspect the presser bar for damage.
- (3) Inspect the presser foot for damage.
- (4) Inspect the thread cutter for damage.
- (5) Inspect the regulator for damage.
- (6) Inspect the spring for damage.
- (7) Inspect the lifter bracket for damage.
- (8) Inspect the guide bracket for damage.
- (9) Inspect the slack thread regulator for damage.
- (10) Inspect the lifter lever for damage.
- (11) Inspect the tension release lever for damage.
- (12) Inspect the link for damage.
- (13) Inspect the needle bar for damage.
- (14) Inspect the needle clamp for damage.
- (15) Inspect the thread guide for damage.
- (16) Inspect the connecting stud for damage.
- (17) Inspect the slide block for damage.
- (18) Inspect the oil wick retainer and oil wick for damage.

d. Repair. Repair is limited to the replacement of defective parts and the removal of burrs.

GO TO NEXT PAGE

6-21. PRESSER BAR AND NEEDLE BAR MAINTENANCE - Continued.

e. *Installation (Refer to Figures 6-66 and 6-67).*

- (1) Refer to Figure 6-66. Install the oil wick retainer (1) with the attached oil wick.
- (2) Install the slide block (2) and connecting stud (3).
- (3) Slide the needle bar (4) into position. Adjust for 1-3/8 inches of exposed bar when the needle bar is at the top of the stroke.
- (4) Tighten the setscrew (5).
- (5) Install the needle clamp (6) and tighten the setscrew (7).
- (6) Install the thread guide (8) and screw (9).

LEGEND:

- | | |
|----------------|-----------------|
| 1. Retainer | 6. Needle Clamp |
| 2. Slide Block | 7. Setscrew |
| 3. Stud | 8. Thread Guide |
| 4. Needle Bar | 9. Screw |
| 5. Setscrew | |

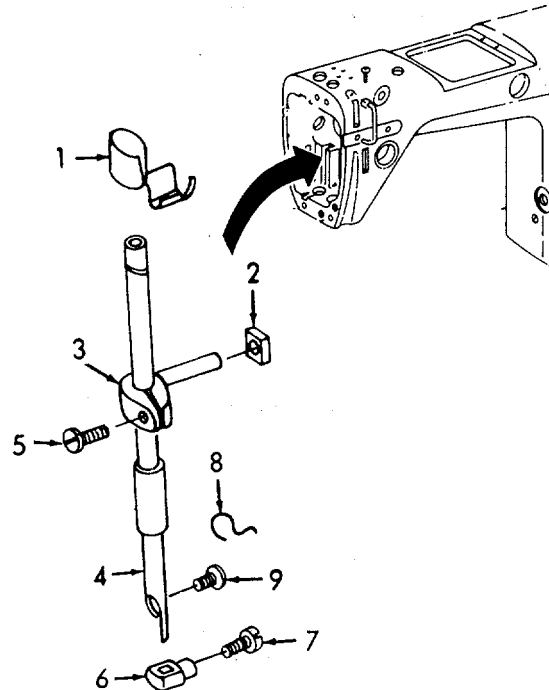


Figure 6-66. Needle Bar, Installation.

- (7) Refer to Figure 6-67. Install the presser bar (1) into the arm and through the lifter bracket (2) and the guide bracket (3).
- (8) Install the link (4) and screw (5).
- (9) Install the spring (6) and tension release lever (7). Use a drift and install the pin (8).

GO TO NEXT PAGE

6-21. PRESSER BAR AND NEEDLE BAR MAINTENANCE - Continued.

e. Installation - Continued.

LEGEND:

- | | |
|-------------------|----------------------|
| 1. Presser Bar | 11. Nut |
| 2. Lifter Bracket | 12. Setscrew |
| 3. Guide Bracket | 13. Thread Regulator |
| 4. Link | 14. Setscrew |
| 5. Screw | 15. Spring |
| 6. Spring | 16. Regulator |
| 7. Release Lever | 17. Thread Cutter |
| 8. Pin | 18. Presser Foot |
| 9. Lifter Lever | 19. Screw |
| 10. Pin | |

- (10) Install the lifter lever (9), pin (10), and nut (11).
- (11) Secure the guide bracket (3) to the presser bar (1) by tightening the setscrew.
- (12) Install the slack thread regulator (13) and tighten the setscrew (14).
- (13) Install the spring (15) and the regulator (16).
- (14) Install the thread cutter (17).
- (15) Install the presser foot (18) and secure with the screw (19).

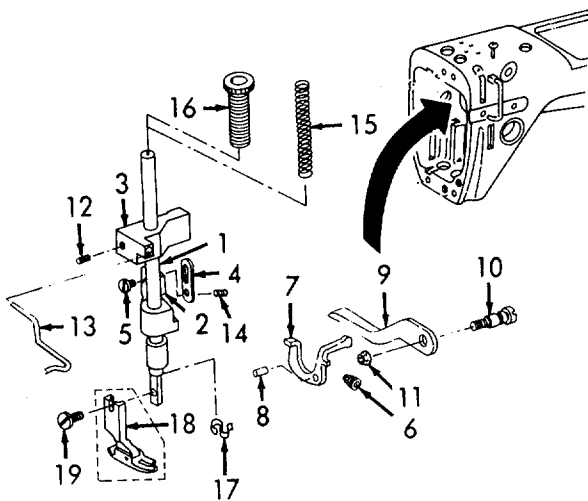


Figure 6-67. Presser Bar, Installation.

END OF TASK

6-22. LIFTING LEVER SHAFT MAINTENANCE .

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

	Equipment Condition	
<u>Applicable Configuration</u>	<u>Para</u>	<u>Condition Description</u>
All	2-12	Electrical power removed.
<u>Test Equipment</u>	2-12	Thread and needle removed.
None	6-13	Face plate removed.
<u>Special Tools</u>	6-18	Slide and throat plates removed.
None	6-21	Presser bar and needle bar removed.
<u>Materials/Parts</u>		
Cleaning Solvent (Appendix E, item 2)		<u>Special Environmental Conditions</u>
Cloth, Soft, Lint-Free (Appendix E, item 3)		None
Brush, Medium Bristle (Appendix E, item 1)		

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-22. LIFTING LEVER SHAFT MAINTENANCE - Continued.

a. *Removal (Refer to Figure 6-68).*

LEGEND:

- | | |
|----------------|-----------|
| 1. Setscrew | 4. Swivel |
| 2. Lever Joint | 5. Shaft |
| 3. Screw | |

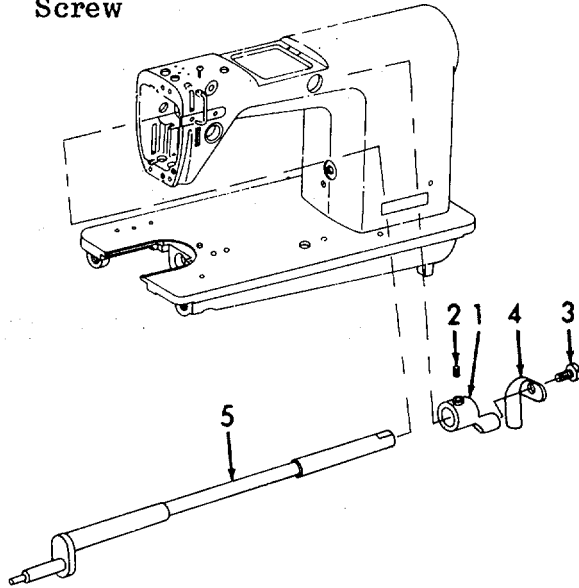


Figure 6-68. Lifting Lever Shaft, Removal.

- (1) Loosen setscrew (1) and remove lever joint (2).
- (2) Remove screw (3) and swivel (4).
- (3) Remove lifting lever shaft (5) out front of head.

b. *Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).

- (3) Allow to dry.

GO TO NEXT PAGE

6-22. LIFTING LEVER SHAFT MAINTENANCE - Continued.*c. Inspection.*

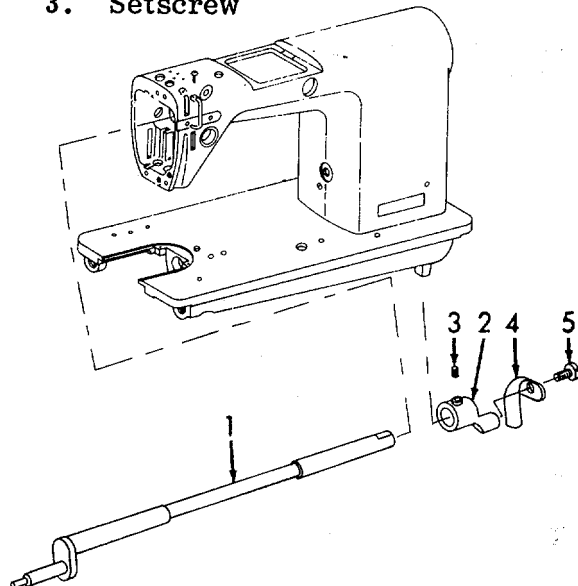
- (1) Inspect hardware for damage.
- (2) Inspect the swivel for damage.
- (3) Inspect the lever joint for damage.
- (4) Inspect the lifting lever shaft for damage.

*d. Repair. Repair of the lifting lever shaft is limited to the replacement of defective parts.**e. Installation (Refer to Figure 6-69).*

- (1) Install lifting lever shaft (1).
- (2) Install lever joint (2) and tighten setscrew (3).
- (3) Install swivel (4) and install screw (5).

LEGEND:

- | | |
|----------------|-----------|
| 1. Shaft | 4. Swivel |
| 2. Lever Joint | 5. Screw |
| 3. Setscrew | |

**Figure 6-69. Lifting Lever Shaft, Installation.**

END OF TASK

6-23. UPPER SHAFT MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

<u>Applicable Configuration</u>	<u>Equipment Condition</u>	<u>Para.</u>	<u>Condition Description</u>
All		2-12	Electrical power removed.
<u>Test Equipment</u>		2-12	Needle and thread removed.
None		6-13	Face plate removed.
<u>Special Tools</u>		6-15	Pulley removed.
None		6-18	Slide and throat plates removed.
<u>Materials/Parts</u>		6-24	Upper feed assembly removed.
Cleaning Solvent (Appendix E, item 2)		6-21	Presser bar and needle bar removed.
Cloth, Soft, Lint-Free (Appendix E, item 3)			
Brush, Medium Bristle (Appendix E, item 1)			
		<u>Special Environmental Conditions</u>	
		None	
 <u>Personnel Required</u>			
1 Person			

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-23. UPPER SHAFT MAINTENANCE - Continued .

a. *Removal (Refer to Figures 6-70 and 6-71).*

(1) Refer to Figure 6-70. Remove left-hand threaded screw (1) and crank rod (2).

(2) Loosen two setscrews (3) (3) and remove crank (4).

CAUTION

Use care when removing lever assembly. Do not allow it to be bent or broken.

NOTE

It may be necessary to drive out the stud from behind.

(3) Remove setscrew (5), stud (6), and lever assembly (7).

(4) Loosen setscrew (8) and remove counter weight (9).

(5) Refer to Figure 6-71. Remove screw (1) and both gear cover halves (2).

(6) Loosen two setscrews (3) on pinion gear (4).

(7) Loosen two setscrews (5) on eccentric (6).

(8) Move sleeve (7).

(9) Loosen two setscrews (8) on collar (9).

(10) Remove shaft (10) out of the pulley end of arm. While pulling the shaft (10), remove the collar (9), sleeve (7), eccentric (6), and the pinion gear (4).

LEGEND:

- | | |
|--------------|-------------------|
| 1. Screw | 6. Stud |
| 2. Crank Rod | 7. Lever Assembly |
| 3. Setscrew | 8. Setscrew |
| 4. Crank | 9. Counter Weight |
| 5. Setscrew | |

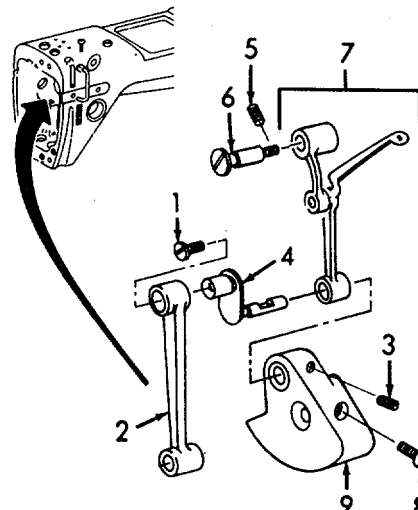


Figure 6-70. Needle Bar Linkage, Removal.

LEGEND:

- | | |
|----------------------|--------------|
| 1. Setscrew | 6. Eccentric |
| 2. Pinion Gear Cover | 7. Sleeve |
| 3. Setscrew | 8. Setscrew |
| 4. Pinion Gear | 9. Collar |
| 5. Setscrew | 10. Shaft |

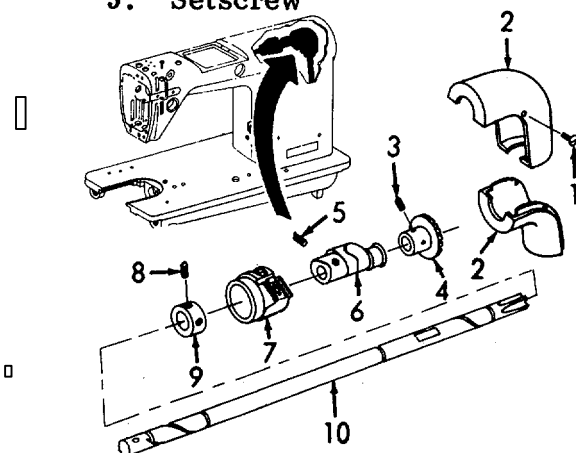


Figure 6-71. Upper Shaft, Removal.

GO TO NEXT PAGE

6-23 UPPER SHAFT MAINTENANCE - Continued .*b. Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

c. Inspection.

- (1) Inspect hardware for damage.
- (2) Inspect the crank rod for damage.
- (3) Inspect the crank for damage.
- (4) Inspect the lever assembly for damage.
- (5) Inspect the counter weight for damage.
- (6) Inspect the pinion gear for damage.
- (7) Inspect the eccentric for damage.
- (8) Inspect the sleeve for damage.
- (9) Inspect the shaft for damage.

- d. Repair.* Repair of the upper shaft is limited to the replacement of defective parts.

GO TO NEXT PAGE

6-23. UPPER SHAFT MAINTENANCE - Continued.

e. *Installation (Refer to Figures 6-72 and 6-73).*

- (1) Refer to Figure 6-72. While installing the shaft (1), install the following but do not tighten the setscrews: pinion (2), eccentric (3), sleeve (4), and collar (5).

NOTE

The lip on the sleeve faces the front.

- (2) Install counter weight (6) on end of shaft (1) and tighten the setscrew (7). Be sure the setscrew is in the hole in the shaft.
- (3) Push the shaft fully rearward and then slide the collar (5) into position against the housing and tighten the setscrews (8).
- (4) Slide the pinion gear (2) into position and tighten the setscrews (9).
- (5) Pack gear case (11) with grease (Appendix E, item 4).
- (6) Install both gear case halves (11) and then install screw (12).
- (7) Slide the eccentric (3) into position and tighten the setscrews (10). Be sure the hole "A" in the counter weight (6) is up and then set setscrew "B" up with setscrew "C" at a 90° angle from vertical.

LEGEND:

- | | |
|-------------------|---------------|
| 1. Shaft | 7. Setscrew |
| 2. Pinion Gear | 8. Setscrew |
| 3. Eccentric | 9. Setscrew |
| 4. Sleeve | 10. Setscrew |
| 5. Collar | 11. Gear Case |
| 6. Counter Weight | 12. Screw |

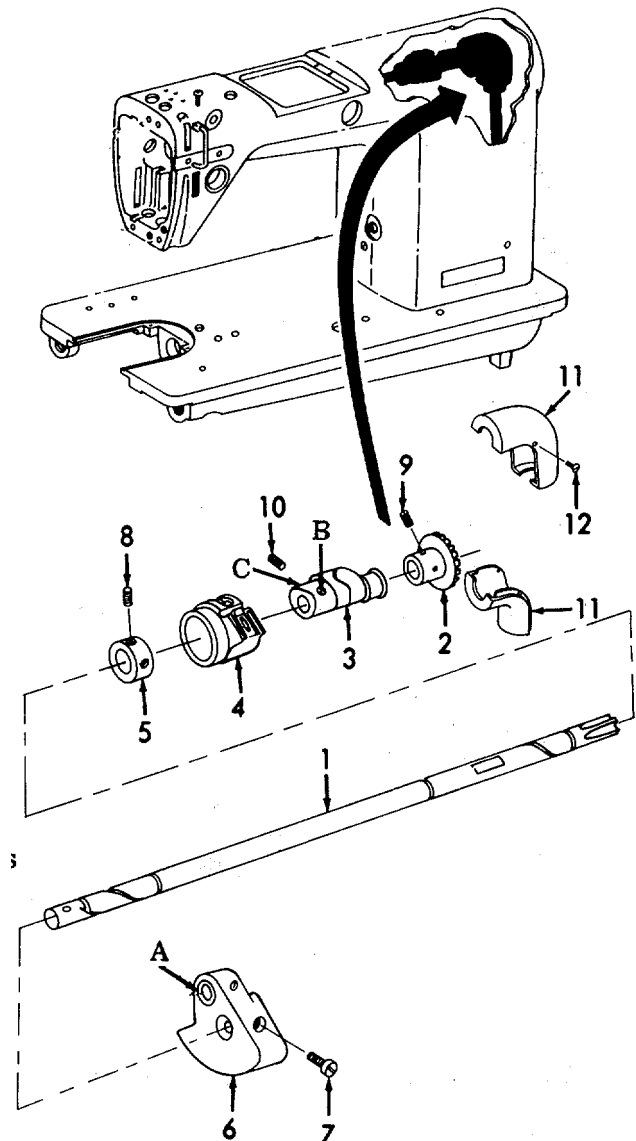


Figure 6-72. Upper Shaft, Installation.

GO TO NEXT PAGE

6-23. UPPER SHAFT MAINTENANCE - Continued.

e. Installation - Continued.

(8) Slide the sleeve (4) into position.

LEGEND:

- | | |
|-------------------|--------------|
| 1. Lever Assembly | 5. Setscrew |
| 2. Stud Screw | 6. Crank Rod |
| 3. Setscrew | 7. Screw |
| 4. Crank | |

(9) Refer to Figure 6-73. Install lever assembly (1), stud screw (2), and setscrew (3).

(10) Install crank (4) and two setscrews (5).

(11) Install crank rod (6) and left-hand threaded screw (7).

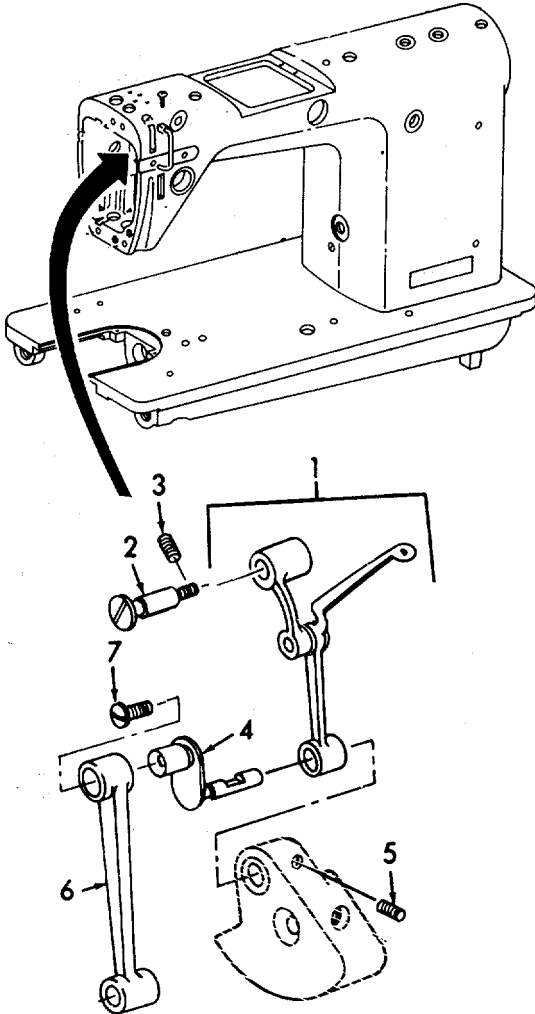


Figure 6-73. Needle Bar Linkage, Installation.

END OF TASK

6-24. UPPER FEED ASSEMBLY MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Equipment
Condition

Para.

2-12

Condition Description

Electrical power removed.

2-12

Needle and thread removed.

2-9

Sewing machine removed from table.

6-18

Lower feed assembly removed.

6-19

Bobbin assembly removed.

6-20

Bed and arm removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-24. UPPER FEED ASSEMBLY MAINTENANCE -Continued.

a. *Removal (Refer to Figures 6-74 through 6-76).*

- (1) Refer to Figure 6-74.
Remove five screws (1).
- (2) Remove cover (2).
- (3) Remove and discard gasket (3).
- (4) Refer to Figure 6-65. Loosen setscrew (1) and slide handle (2) off shaft.
- (5) Remove two bevel washers (3).
- (6) Remove setscrew (4) and setscrew (5).
- (7) Remove screw (6) and two washers (7).
- (8) Remove the reverse feed control arm (8) and the reverse feed control shaft crank (9) while sliding the shaft (10) out of the arm.

LEGEND:

1. Gasket
2. Cover
3. Screw

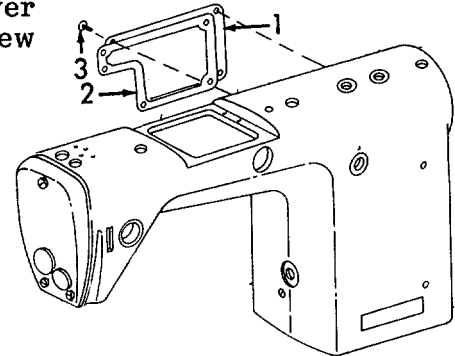


Figure 6-74. Side Cover, Removal.

LEGEND:

- | | |
|-----------------|----------------|
| 1. Setscrew | 6. Screw |
| 2. Handle | 7. Washer |
| 3. Bevel Washer | 8. Control Arm |
| 4. Setscrew | 9. Crank |
| 5. Setscrew | 10. Shaft |

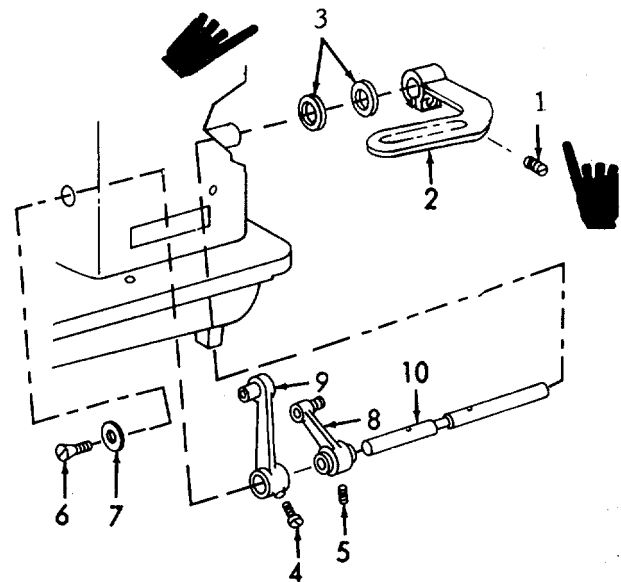


Figure 6-75. Reversing Control Shaft, Removal.

GO TO NEXT PAGE

6-24. UPPER FEED ASSEMBLY MAINTENANCE -Continued .

a. Removal - Continued.

LEGEND :

- | | |
|-----------------------|---------------|
| 1. Screw | 7. Nut |
| 2. Rod Cap | 8. Screw |
| 3. Connecting Rod | 9. Link |
| 4. Setscrew | 10. Feed Fork |
| 5. Screw | 11. Setscrew |
| 6. Feed Fork Assembly | 12. Pin |
| | 13. Regulator |

- (9) Refer to Figure 6-76. Use the access holes at the top of the arm and remove two screws (1) and connecting rod cap (2).
- (10) Remove the connecting rod (3) out the bottom of the arm.
- (11) Loosen the setscrew (4) and remove the pin (5).
- (12) Remove the feed fork assembly (6).
- (13) Remove the nut (7), screw (8), and the regulator link (9) from the feed fork (10).
- (14) Remove the setscrew (11), pin (12), and the feed regulator (13).

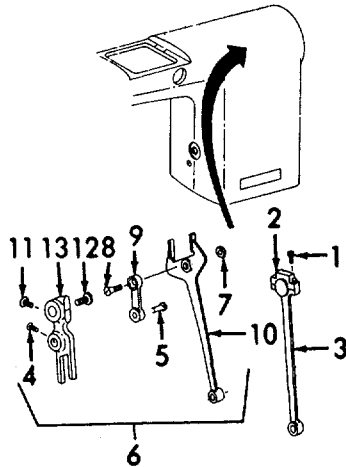


Figure 6-76. Upper Feed Assembly, Removal.

b. Cleaning.

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

GO TO NEXT PAGE

6-24 UPPER FEED ASSEMBLY MAINTENANCE -Continued.

c. *Inspection.*

- (1) Inspect hardware for damage.
- (2) Inspect the side cover for damage.
- (3) Inspect the shaft for damage.
- (4) Inspect the reverse control feed arm for damage.
- (5) Inspect the reverse control feed control shaft for damage.
- (6) Inspect the lever for damage.
- (7) Inspect the connecting rod and cap for damage.
- (8) Inspect the feed fork for damage.
- (9) Inspect the regulator link for damage.
- (10) Inspect the feed regulator for damage.

d. *Repair.* Repair is limited to the replacement parts.

e. *Installation (Refer to Figures 6-77 through 6-79).*

NOTE

Remove burrs from all parts to ensure a good fit.

- (1) Refer to Figure 6-77. Install the feed regulator (1), pin (2), and setscrew (3). The regulator (1) should move freely.
- (2) Install the regulator link (4), screw (5), and nut (6) to the feed fork (7). The link (4) should move freely.
- (3) Install the feed fork assembly (8).
- (4) Install the pin (9) and the setscrew (10). The link (4) should move freely.

LEGEND:

- | | |
|-------------------|-----------------------|
| 1. Feed Regulator | 8. Feed Fork Assembly |
| 2. Pin | 9. Pin |
| 3. Setscrew | 10. Setscrew |
| 4. Link | 11. Connecting Rod |
| 5. Screw | 12. Rod Cap |
| 6. Nut | 13. Screw |
| 7. Feed Fork | |

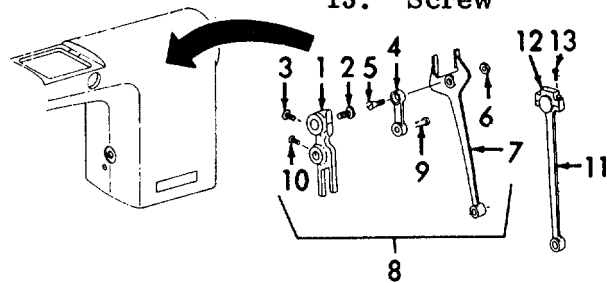


Figure 6-77. Upper Feed Assembly Installation.

GO TO NEXT PAGE

6-24. UPPER FEED ASSEMBLY MAINTENANCE -Continued.

e. Installation - Continued.

- (5) Install the connecting rod (11), cap (12), and two screws (13). Be sure the ridge on the side of the cap is on the same side as the ridge on the side of the connecting rod and that both ridges are opposite the side opening.

LEGEND:

- | | |
|------------------|-----------------|
| 1. Shaft | 6. Washer |
| 2. Control Arm | 7. Screw |
| 3. Control Crank | 8. Bevel Washer |
| 4. Setscrew | 9. Lever |
| 5. Setscrew | 10. Setscrew |

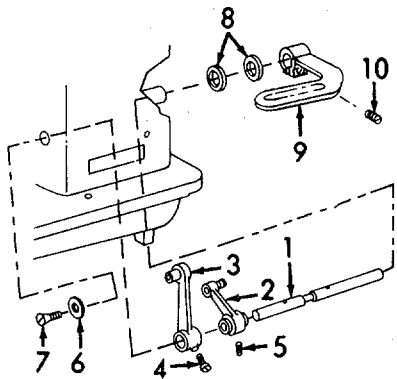


Figure 6-78. Reversing Control Shaft, Installation.

- (6) Refer to Figure 6-78. While sliding the shaft (1) into the arm, slide the reversing feed control arm (2) and the reversing feed control crank (3) onto the shaft. Be sure the fork arm is on the front of the shaft and the connecting rod arm is on the rear of the shaft.
- (7) Install the setscrews (4 and 5). Be sure that the setscrews point seat into the drilled holes in the shaft. This ensures proper arm and crank positioning.
- (8) Install two washers (6) hollow side in and screw (7).

- (9) Install two bevel washers (8) hollow side in.

- (10) Install the lever (9) with the handle in the full up position and then tighten the setscrew (10).

LEGEND:

- | |
|-----------|
| 1. Gasket |
| 2. Cover |
| 3. Screw |

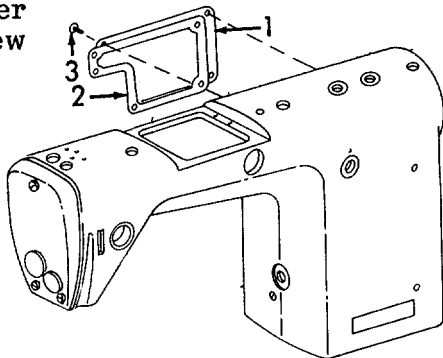


Figure 6-79. Side Cover, Installation.

- (11) Refer to Figure 6-79. Install a new gasket (1) into position.
- (12) Install cover (2) into position.
- (13) Install five screws (3).

END OF TASK

6-25. VERTICAL SHAFT MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

<u>Applicable Configuration</u>	<u>Equipment Condition</u>	<u>Para.</u>	<u>Condition Description</u>
All		2-12	Electrical power removed.
<u>Test Equipment</u>		2-12	Needle and thread removed.
None		6-13	Face plate removed.
<u>Special Tools</u>		6-15	Pulley removed.
None		6-17	Lower feed assembly removed.
<u>Materials/Parts</u>		6-18	Slide and throat plates removed.
Cleaning Solvent (Appendix E, item 2)		6-19	Bobbin assembly removed.
Cloth, Soft, Lint-Free (Appendix E, item 3)		6-21	Upper feed assembly removed.
Brush, Medium Bristle (Appendix E, item 1)		6-22	Presser bar and needle-bar removed.
		6-24	Upper shaft removed.
<u>Personnel Required</u>			<u>Special Environmental Conditions</u>
1 Person			None

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6- 25. VERTICAL SHAFT MAINTENANCE -Continued.

a. Removal (Refer to Figure 6-80).

LEGEND:

- | | |
|-----------------|-----------------|
| 1. Setscrew | 6. Collar |
| 2. Lower Pinion | 7. Setscrew |
| 3. Setscrew | 8. Upper Pinion |
| 4. Collar | 9. Shaft |
| 5. Setscrew | |

- (1) Loosen two setscrews (1) and remove lower pinion (2).
- (2) Loosen two setscrews (3) on collar (4).
- (3) Loosen two setscrews (5) on collar (6).
- (4) Loosen two setscrews (7) on upper pinion (8).
- (5) Remove shaft (9), pinion (8), collar (6), and collar (4).

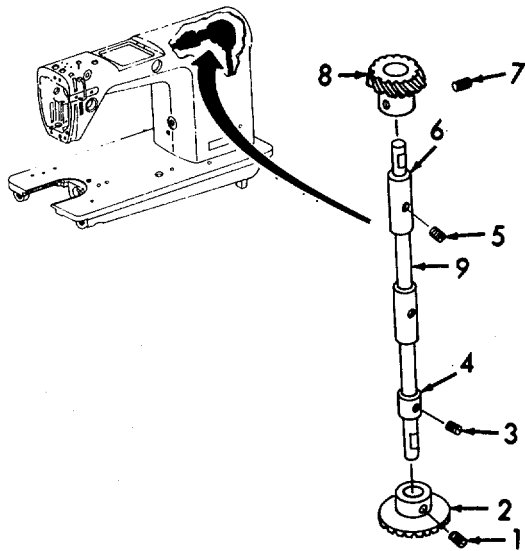


Figure 6-80. Vertical Shaft, Removal.

b. Cleaning.

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).

- (3) Allow to dry.

GO TO NEXT PAGE

6-25. VERTICAL SHAFT MAINTENANCE -Continued.*c. Inspection.*

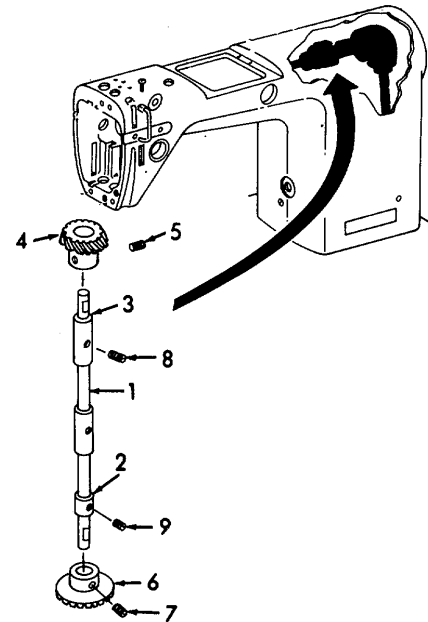
- (1) Inspect for loose, missing, or damaged hardware.
- (2) Inspect pinion gears for damage.
- (3) Inspect collars for damage.
- (4) Inspect shaft for damage.

d. Repair. Repair of the vertical shaft is limited to the replacement of defective parts.*e. Installation (Refer to Figure 6-81).*

- (1) Insert shaft (1) through bottom bushing.
- (2) Slip on both the lower collar (2) and the upper collar (3).
- (3) Slide the shaft (1) through the upper bushing.
- (4) Install the upper pinion gear (small) (4).
- (5) Set the pinion gear (4) flush with the end of the shaft (1). Tighten both setscrews (5).
- (6) Install the bottom pinion gear (6). Tighten both setscrews (7).
- (7) Move the upper collar (3) into position and tighten both setscrews (8).
- (8) Move the lower collar (2) into position and tighten both setscrews (9).

LEGEND:

- | | |
|-----------------|------------------|
| 1. Shaft | 6. Bottom Pinion |
| 2. Lower Collar | 7. Setscrew |
| 3. Upper Collar | 8. Setscrew |
| 4. Upper Pinion | 9. Setscrew |
| 5. Setscrew | |

**Figure 6-81. Vertical Shaft, Installation.**

END OF TASK

6-26. MACHINE TIMING.

This task covers:
Machine Timing

INITIAL SETUP

Applicable Configuration
All

Test Equipment
None

Special Tools
None

Materials/Parts
None

Personnel Required
1 Person

Equipment
Condition

Para.	Condition Description
2-12	Electrical power removed.
6-18	Slide and throat plates removed.

Special Environmental Conditions
None

General Safety Instructions
None

Machine Timing, Needle to Hook (Refer to Figure 6-82).

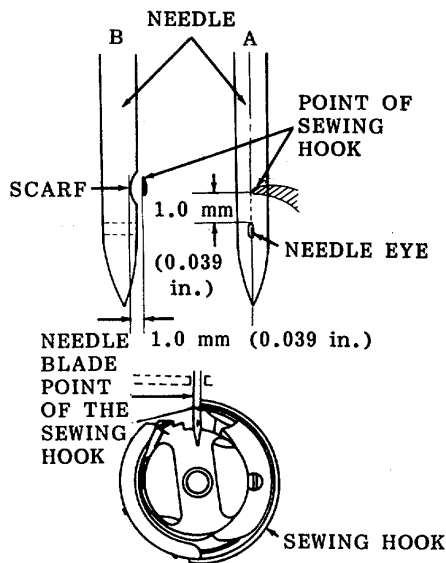


Figure 6-82. Machine Timing.

- a. Bring the needle to its lowest position and then raise the needle 2.24 mm (3/32 inch).
- b. Rotate the rotary hook so that the point is at the needle center line.
- c. Check that the needle eye is 1 cc (0.039 mm) above the hook point (A). If it is not, remove the face plate and loosen the needle bar clamp screw. Move the needle bar, as necessary, and retighten the screws.
- d. Move the rotary hook so that it is 1 cc (0.039 mm) away from the needle scarf.
- e. Check that the rotary hook point is at the center line of the needle. Loosen the setscrews and rotate the rotary hook as needed.
- f. Tighten the three rotary hook setscrews and recheck all settings.

END OF TASK

6-27. ELECTRIC MOTOR MAINTENANCE.

This task covers:

- a. Removal b. Cleaning c. Inspection d. Repair
 e. Installation

INITIAL SETUP

Applicable Configuration
 All

Test Equipment
 None

Special Tools
 None

Materials/Parts
 Cleaning Solvent
 (Appendix E, item 2)
 Cloth, Soft, Lint-Free
 (Appendix E, item 3)
 Brush, Medium Bristle
 (Appendix E, item 1)

Equipment
 Condition

<u>Para.</u>	<u>Condition Description</u>
2-12	Electrical power removed.
2-9	Belt removed.

Special Environmental Conditions
 None

Personnel Required
 1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

a. *Removal (Refer to Figure 6-83).*

- (1) Tag and disconnect wiring from motor.
- (2) Remove four nuts (1), four lockwashers (2), four washers (3), and motor assembly (4).

LEGEND:

- | | |
|---------------|-----------|
| 1. Nut | 3. Washer |
| 2. Lockwasher | 4. Motor |

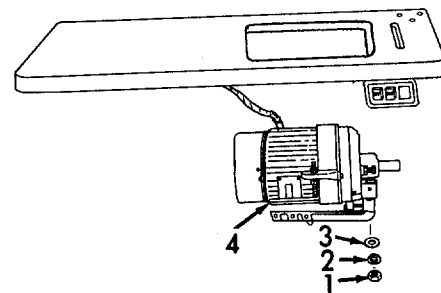


Figure 6-83. Electric Motor, Removal.

GO TO NEXT PAGE

6-27. ELECTRIC MOTOR MAINTENANCE-Continued.

b. Cleaning.

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

c. Inspection.

- (1) Inspect for loose, missing, or damaged hardware.
- (2) Inspect for damaged or deteriorated electrical wiring.
- (3) Inspect for damaged switch box.
- (4) Inspect for damaged motor.

d. Repair. Repair of the electric motor is limited to the replacement of defective parts.

e. Installation (Refer to Figure 6-84).

LEGEND:

- 1. Motor**
- 2. Washer**
- 3. Lockwasher**
- 4. Nut**

(1) Connect wiring to motor (1) per tagged identification.

(2) Place motor (1) into position and install four washers (2), four lockwashers (3), and four nuts (4).

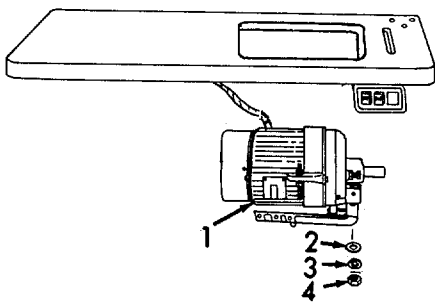


Figure 6-84. Electric Motor, Installation.

END OF TASK

SECTION IV. MAINTENANCE OF DARNING SEWING MACHINE

	Para.		Para.
Electric Motor Maintenance.....	6-37	Needle Thread Tension	
General.....	6-28	Assembly Maintenance.....	6-30
Hook Shaft Assembly Maintenance	6-31	Pulley Maintenance	6-34
Machine Timing	6-36	Thread Guides Maintenance	6-29
Needle Bar and Presser Bar		Upper Shaft Assembly	
Assembly Maintenance.....	6-33	Maintenance.....	6-35
		Vertical Shaft Assembly	
		Maintenance.....	6-32

6-28. GENERAL.

This section contains information on the removal, disassembly, cleaning, inspection, repair, assembly, installation, and adjustment of the various parts of the darning sewing machine.

6-29. THREAD GUIDES MAINTENANCE.

This task covers:

- | | | | | | | | |
|----|---------|----|-------------|----|--------------|----|------------|
| a. | Removal | b. | Disassembly | c. | Cleaning | d. | Inspection |
| e. | Repair | f. | Assembly | g. | Installation | | |

INITIAL SETUP

Applicable Configuration
All

Test Equipment
None

Special Tools
None

Materials/Parts
 Cleaning Solvent
 (Appendix E, item 2)
 Cloth, Soft, Lint-Free
 (Appendix E, item 3)
 Brush, Medium Bristle
 (Appendix E, item 1)

Equipment
 Condition
Para. Condition Description
 2-12 Electrical power
 removed.
 2-13 Thread and needle
 removed.

Special Environmental Conditions
None

Personnel Required
1 Person

General Safety Instructions



Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-29. THREAD GUIDES MAINTENANCE-Continued.

a. *Removal (Refer to Figures 6-85 and 6-86).*

- (1) Refer to Figure 6-85. Pull press-fit pin (1) straight up.
- (2) Remove needle thread guide assembly (2).
- (3) Remove post (3).

LEGEND:

- 1. Pin
- 2. Thread Guide Assembly
- 3. Post

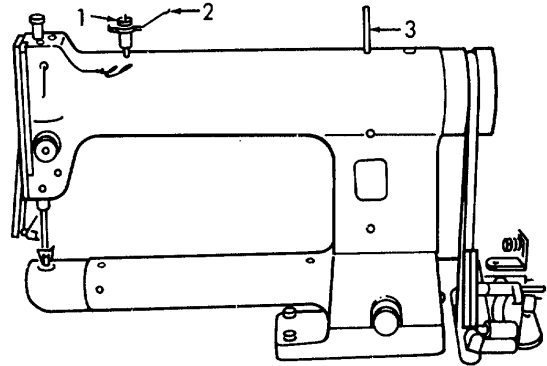


Figure 6-85. Needle Thread Guide, Removal.

- (4) Refer to Figure 6-86. Using lock pliers, pull outward and turn to remove press-fit upper needle thread guide (1).
- (5) Using lock pliers, pull outward and turn to remove press-fit lower needle thread guide (2).

LEGEND:

- 1. Upper Needle Thread Guide
- 2. Lower Needle Thread Guide

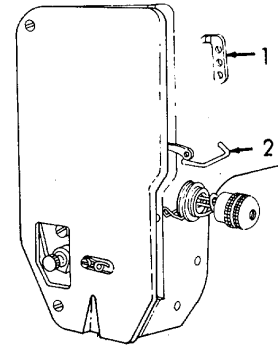


Figure 6-86. Thread Guides, Removal.

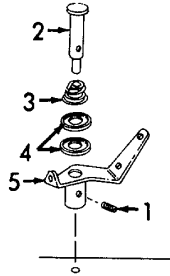
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6-29. THREAD GUIDES MAINTENANCE-Continued.

b. *Disassembly (Refer to Figure 6-87).*

LEGEND:

- | | |
|-------------|-----------------|
| 1. Setscrew | 4. Tension Disc |
| 2. Pin | 5. Thread Guide |
| 3. Spring | |



(1) Loosen setscrew (1).

(2) Remove pin (2), spring (3), and two tension discs (4) from thread guide (5).

Figure 6-87. Needle Thread Guide, Disassembly.

c. *Cleaning.*

(1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

(2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).

(3) Allow to dry.

d. *Inspection.*

(1) Inspect upper thread guide for damage.

(2) Inspect lower thread guide for damage.

(3) Inspect for stripped or otherwise damaged threads.

(4) Inspect for broken spring.

(5) Inspect for burred or otherwise damaged tension discs.

GO TO NEXT PAGE

6-29. THREAD GUIDES MAINTENANCE-Continued.

e. *Repair.* Repair of the thread guides is limited to the replacement of defective components.

f. *Assembly (Refer to Figure 6-88).*

- (1) Install spring (1) on pin (2).
- (2) Place bevels of discs (3) together and install disc on pin (2).
- (3) Install thread guide (4) on pin (2) and tighten setscrew (5).

LEGEND:

- 1. Spring
- 2. Pin
- 3. Tension Disc
- 4. Thread Guide
- 5. Setscrew

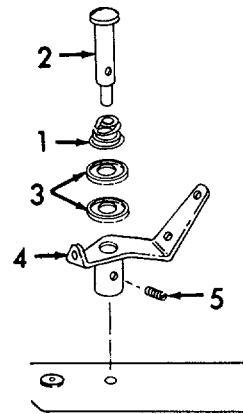


Figure 6-88. Needle Thread Guide, Assembly.

g. *Installation (Refer to Figures 6-89 and 6-90).*

- (1) Refer to Figure 6-89. Install upper thread guide (1) by pressing into place.
- (2) Install lower thread guide (2) by pressing into place.

LEGEND:

- 1. Upper Thread Guide
- 2. Lower Thread Guide

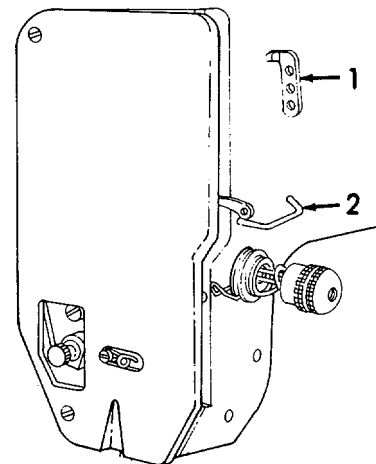


Figure 6-89. Thread Guides, Installation.

GO TO NEXT PAGE

6-29. THREAD GUIDES MAINTENANCE-Continued.

g. Installation-Continued.

LEGEND:

1. Thread Guide
2. Pin
3. Post

(3) Refer to Figure 6-90. Install entire needle thread guide (1) into hole and tap lightly to seat.

(4) Install post (3).

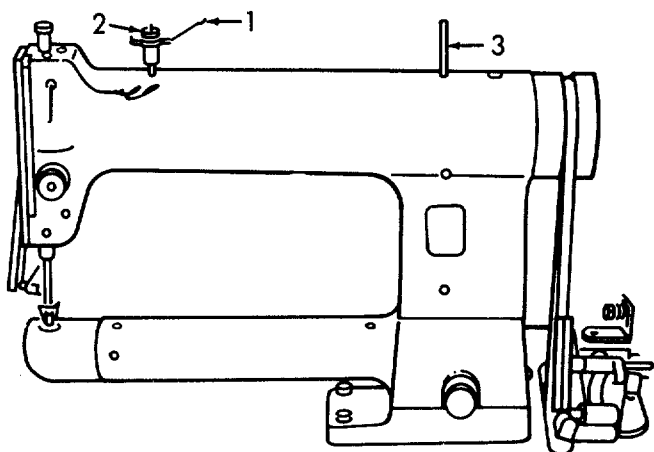


Figure 6-90. Needle Thread Guide Assembly, Installation.

END OF TASK

6-30. NEEDLE THREAD TENSION ASSEMBLY MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

- Cleaning Solvent
(Appendix E, item 2)
- Cloth, Soft, Lint-Free
(Appendix E, item 3)
- Brush, Medium Bristle
(Appendix E, item 1)

Equipment
Condition

<u>Para.</u>	<u>Condition Description</u>
2-12	Electrical power removed.
2-13	Thread and needle removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions



Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-30. NEEDLE THREAD TENSION ASSEMBLY MAINTENANCE Continued.

a. Removal (Refer to Figures 6-91 and 6-92).

LEGEND:

- 1. Screw
- 2. Face Plate

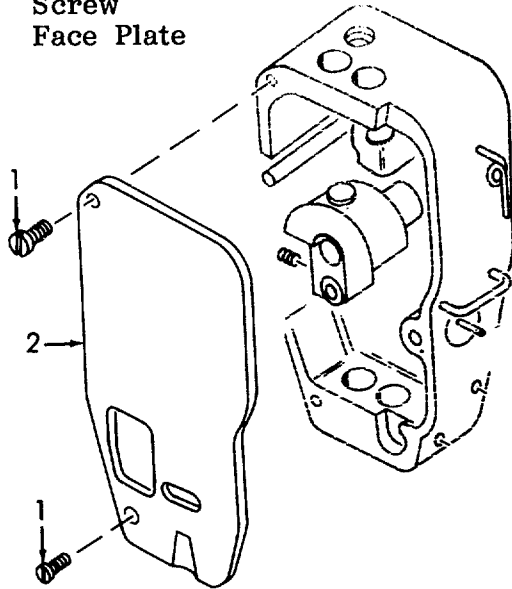


Figure 6-91. Face Plate, Removal.

- (1) Remove two screws (1).
- (2) Remove face plate (2).

LEGEND:

- 1. Setscrew
- 2. Tension Assembly

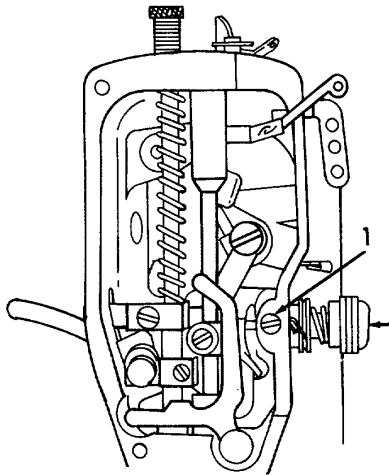


Figure 6-92. Needle Thread Tension Assembly, Removal.

- (3) Refer to Figure 6-92. Loosen setscrew (1) but do not remove.
- (4) Carefully remove needle guide tension assembly (2) as an assembly.

GO TO NEXT PAGE

6-30. NEEDLE THREAD TENSION ASSEMBLY MAINTENANCE Continued.*b. Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth, without disassembling the assembly.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).

- (3) Allow to dry.

*c. Inspection. Inspect assembly for damage.**d. Repair.* Repair of the needle thread tension assembly is limited to the replacement of a defective assembly.*e. Installation (Refer to Figures 6-93 and 6-94).*

- (1) Refer to Figure 6-93. Install thread tension assembly (1) into upper arm as an assembly.

NOTE

The position of the needle thread tension assembly in the arm is correct when the top of the take-up spring hook (1) is opposite the center line of the setscrew (2) as shown at the right. To obtain this position, loosen setscrew (2) and rotate the entire assembly the desired amount.

- (2) Tighten setscrew (2).

LEGEND:

1. Tension Assembly
2. Setscrew

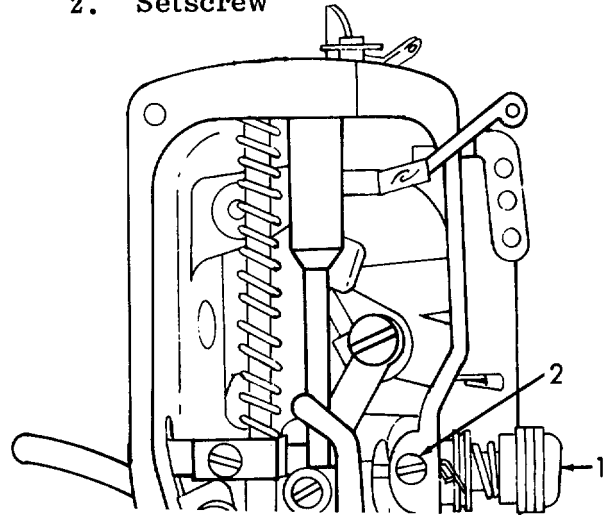


Figure 6-93. Needle Thread Tension Assembly, Installation.

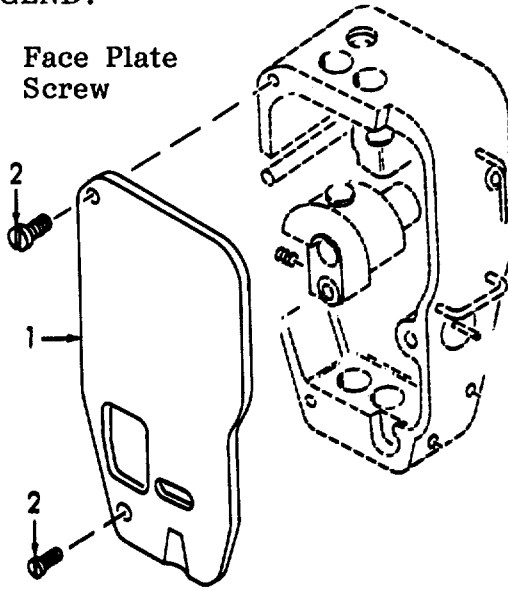
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6-30. NEEDLE THREAD TENSION ASSEMBLY MAINTENANCE Continued.

e. *Installation-Continued.*

LEGEND:

- 1. Face Plate
- 2. Screw



(3) Refer to Figure 6-94. Place face plate (1) into position.

(4) Install two screws (2).

Figure 6-94. Face Plate, Installation.

END OF TASK

6-31. HOOK SHAFT ASSEMBLY MAINTENANCE.

This task covers:

- | | | | |
|------------|----------------|-----------------|---------------|
| a. Removal | b. Disassembly | c. Cleaning | d. Inspection |
| e. Repair | f. Assembly | g. Installation | |

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

- Cleaning Solvent
(Appendix E, item 2)
- Cloth, Soft, Lint-Free
(Appendix E, item 3)
- Brush, Medium Bristle
(Appendix E, item 1)

Equipment
Condition

<u>Para.</u>	<u>Condition Description</u>
2-12	Electrical power removed.
2-13	Thread and needle removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

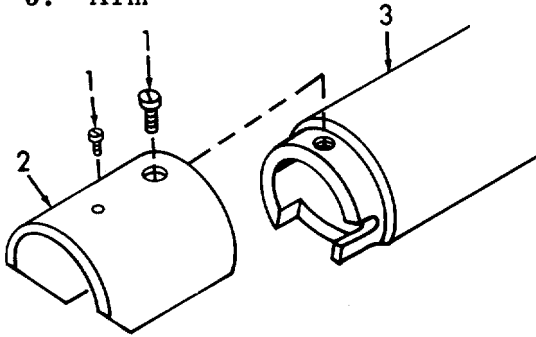
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6-31. HOOK SHAFT ASSEMBLY MAINTENANCE-Continued.

a. Removal (Refer to Figures 6-95 through 6-97).

LEGEND:

- 1. Screw
- 2. Latch Guard
- 3. Arm

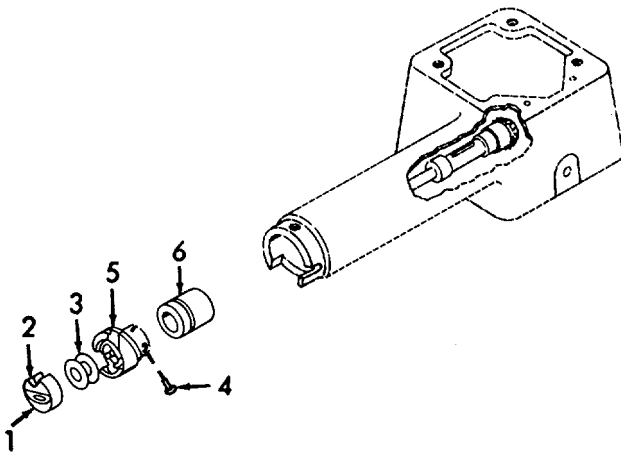


- (1) Refer to Figure 6-95. Remove two screws (1) securing latch guard (2) to lower arm (3).
- (2) Carefully slide latch guard (2) forward from lower arm (3).

Figure 6-95. Latch Guard and Latch, Removal.

LEGEND:

- 1. Latch
- 2. Case
- 3. Bobbin
- 4. Setscrew
- 5. Sewing Hook
- 6. Shaft



- (3) Refer to Figure 6-96. Pull on bobbin case latch (1) and pull bobbin case (2) and bobbin (3) to remove from rotary-sewing hook (5).
- (4) Loosen the three setscrews (4) and remove rotary-sewing hook (5) from hook shaft (6).

Figure 6-96. Bobbin and Rotary Sewing Hook Assemblies, Removal.

GO TO NEXT PAGE

6-31. HOOK SHAFT ASSEMBLY MAINTENANCE-Continued.

a. Removal-Continued.

- (5) Refer to Figure 6-97 Loosen thumbscrew (1) and tilt head to rear.
- (6) Loosen two setscrews (2) on hook shaft gear (3).
- (7) Loosen two setscrews (4) on rear hook shaft collar (5) and two setscrews (6) on front hook shaft collar (7).
- (8) Pull forward on hook shaft (8) and out of lower arm.
- (9) Remove bushing (9).

LEGEND:

- | | |
|---------------|-------------|
| 1. Thumbscrew | 5. Collar |
| 2. Setscrew | 6. Setscrew |
| 3. Shaft Gear | 7. Collar |
| 4. Setscrew | 8. Shaft |
| | 9. Bushing |

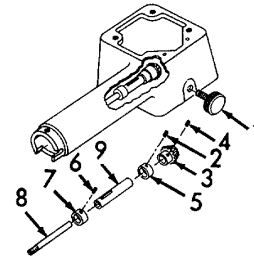


Figure 6-97. Hook Shaft Assembly, Removal.

b. Disassembly.

- (1) Refer to Figure 6-98. Loosen setscrew (1).
- (2) Remove latch (2).

LEGEND:

- 1. Latch
- 2. Screw

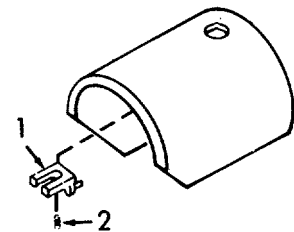


Figure 6-98. Latch Guard and Latch, Disassembly.

c. Cleaning.

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

GO TO NEXT PAGE

6-31. HOOK SHAFT ASSEMBLY MAINTENANCE-Continued.

c. *Cleaning-Continued.*

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

d. *Inspection.*

- (1) Inspect hardware for damage.
- (2) Inspect latch guard and latch for damage.
- (3) Inspect the bobbin case and rotary-sewing hook assembly for damage.
- (4) Inspect hook shaft gear for damage.
- (5) Inspect the hook shaft for damage.
- (6) Inspect front and rear hook shaft collars for damage.
- (7) Inspect bushing and yoke bushing for damage.

e. *Repair.* Repair of the hook shaft assembly is limited to replacement of defective components.

f. *Assembly (Refer to Figure 6-99).*

LEGEND:

- 1. Latch
- 2. Screw

- (1) Install latch (1) into position.
- (2) Tighten screw (2).

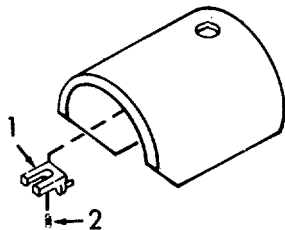


Figure 6-99. Latch Guard and Latch, Assembly.

GO TO NEXT PAGE

6-31. HOOK SHAFT ASSEMBLY MAINTENANCE-Continued.

g. Installation (Refer to Figures 6-100 through 6-102).

- (1) Refer to Figure 6-100. Apply lubricating oil to hook shaft (8) and insert it through the yoke shaft bushing (9) and through to the rear of the arm.
- (2) Install front and rear hook shaft collars (5 and 7) onto hook shaft (8) and tighten setscrews (4 and 6) in collar.
- (3) Install hook shaft gear (3) on hook shaft (8) and tighten setscrew (2). Figure 6-100. Hook Shaft, Installation.

LEGEND:

- | | |
|-------------|-------------|
| 1. Knob | 5. Collar |
| 2. Setscrew | 6. Setscrew |
| 3. Gear | 7. Collar |
| 4. Setscrew | 8. Shaft |
| | 9. Bushing |

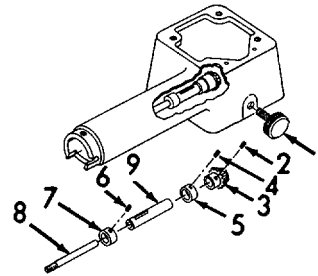


Figure 6-100. Hook Shaft, Installation.

- (4) Refer to Figure 6-101. Install rotary-sewing hook (1) on hook shaft (2) and tighten three setscrews (3).
- (5) Install bobbin (4) in bobbin case (5) while holding latch (6) open, install bobbin and bobbin case in rotary-sewing hook.

LEGEND:

- | | |
|----------------|-----------|
| 1. Sewing Hook | 4. Bobbin |
| 2. Shaft | 5. Case |
| 3. Setscrew | 6. Latch |

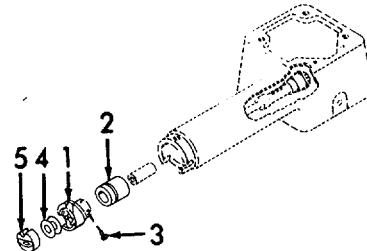


Figure 6-101. Bobbin and Rotary Sewing Hook Assemblies, Installation.

- (6) Refer to Figure 6-102. Install latch guard (1) into place over mounting holes in lower arm (2). Be sure to catch the notch in the bobbin case.
- (7) Install two mounting screws (3) and tighten.

LEGEND:

- | | |
|----------|--------|
| 1. Guard | 2. Arm |
| 3. Screw | |

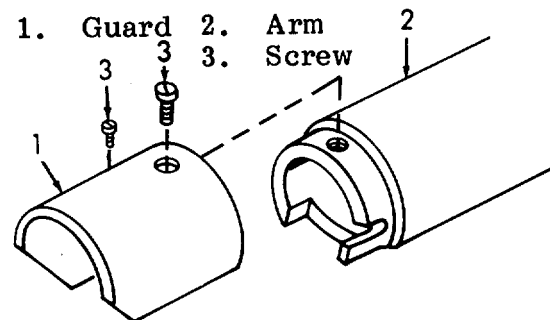


Figure 6-102. Latch Guard and Latch, Installation.

6-32. VERTICAL SHAFT ASSEMBLY MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

- Cleaning Solvent
(Appendix E, item 2)
- Cloth, Soft, Lint-Free
(Appendix E, item 3)
- Brush, Medium Bristle
(Appendix E, item 1)

Equipment
Condition

<u>Para.</u>	<u>Condition Description</u>
2-13	Electrical power removed.
2-13	Thread and needle removed.
6-31	Hook shaft removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-32. VERTICAL SHAFT ASSEMBLY MAINTENANCE-Continued.

a. Removal (Refer to Figures 6-103 and 6-104).

(1) Refer to Figure 6-103. Remove two screws (1).

(2) Remove cover (2).

LEGEND:

- 1. Screw
- 2. Cover

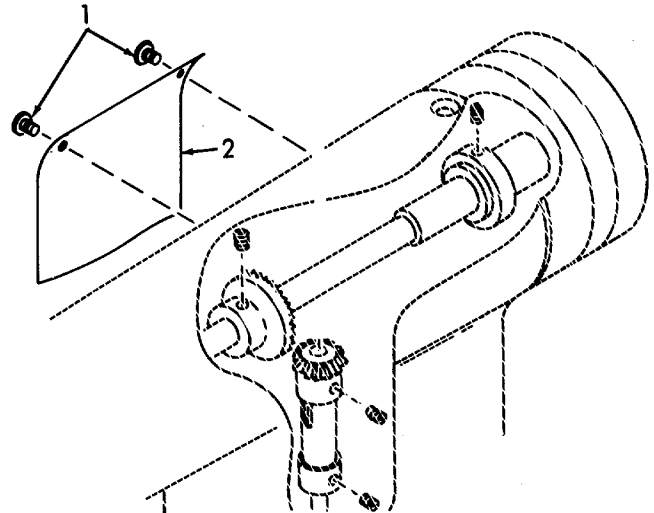


Figure 6-103. Side Cover, Removal.

(3) Refer to Figure 6-104. Loosen (but do not remove) two set screws (1) in top shaft gear (2). Move top shaft gear forward slightly.

(4) Loosen two setscrews (3) on top vertical shaft gear (4).

(5) Loosen two setscrews (5) on upper vertical shaft collar (6) and two setscrews (7) on lower vertical shaft collar (8).

(6) Pull down lower vertical shaft gear (9) to remove vertical shaft (10).

LEGEND:

- 1. Setscrew
- 2. Gear
- 3. Setscrew
- 4. Gear
- 5. Setscrew
- 6. Collar
- 7. Setscrew
- 8. Collar
- 9. Gear
- 10. Shaft

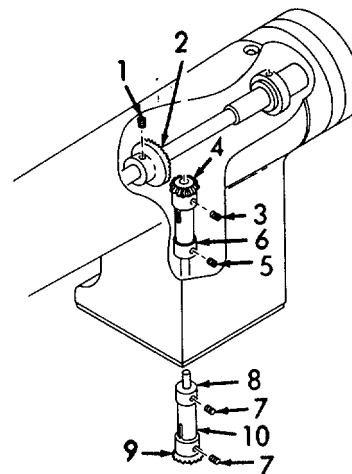


Figure 6-104. Vertical Shaft Assembly, Removal.

GO TO NEXT PAGE

6-32. VERTICAL SHAFT ASSEMBLY MAINTENANCE-Continued.*b. Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix D, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

c. Inspection.

- (1) Inspect hardware for damage.
- (2) Inspect side cover for damage.
- (3) Inspect upper and lower vertical shaft gears for damage.
- (4) Inspect shaft collars for damage.
- (5) Inspect vertical shaft for damage.

d. Repair. Repair is limited to replacement of defective components.

GO TO NEXT PAGE

6-32. VERTICAL SHAFT ASSEMBLY MAINTENANCE-Continued.

e.. *Installation (Refer to Figures 6-105 and 6-106).*

- (1) Refer to Figure 6-105. Install lower vertical shaft gear (9) flush on bottom of vertical shaft (10) and tighten two setscrews (7).
- (2) Lightly oil and insert vertical shaft (10) into lower bushings. Install, but do not tighten collars.
- (3) Install top vertical shaft gear (4) flush with top of vertical shaft (10) and tighten two setscrews (3).
- (4) Move top shaft gear (2) to mesh with shaft gear (4) and tighten two setscrews (1).

LEGEND:

- | | |
|-------------|-------------|
| 1. Setscrew | 6. Collar |
| 2. Gear | 7. Setscrew |
| 3. Setscrew | 8. Collar |
| 4. Gear | 9. Gear |
| 5. Setscrew | 10. Shaft |

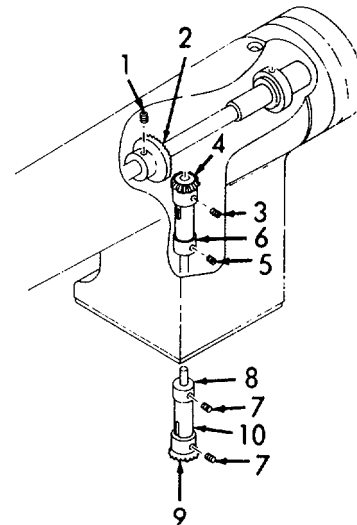


Figure 6-105. Vertical Shaft Assembly, Installation.

- (5) Adjust vertical shaft collars (6 and 8) so that there is no up and down end play on either lower or upper vertical shaft gears (4 and 10), and that a good mesh is made.
- (6) Tighten two setscrews (5 and 7) when positioned properly.
- (7) Refer to Figure 6-106. Position side cover (1) into place.
- (8) Install two screws (1).

LEGEND:

- | | |
|----------|----------|
| 1. Cover | 2. Screw |
|----------|----------|

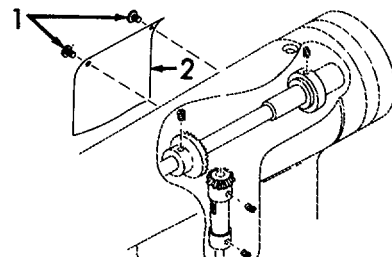


Figure 6-106. Side Cover, Installation.

6-33. NEEDLE BAR AND PRESSER BAR ASSEMBLY MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Equipment
Condition

Para.

2-13

Condition Description

Electrical power
removed.

Test Equipment

None

2-13

Thread and needle
removed.

Special Tools

None

Special Environmental Conditions

None

Materials/Parts

Cleaning Solvent
(Appendix E, item 2)
Cloth, Soft, Lint-Free
(Appendix E, item 3)
Brush, Medium Bristle
(Appendix E, item 1)

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-33. NEEDLE BAR AND PRESSER BAR ASSEMBLY MAINTENANCE-Continued.

a. Removal (Refer to Figures 6-107 and 6-108).

- (1) Refer to Figure 6-107. Remove presser bar tension thumbscrew (1), tension spring (2), and spring rod (3).
- (2) Loosen clamp screw (5) on presser bar guide assembly (4).
- (3) Loosen clamp screw (7) on presser lifter block assembly (6).
- (4) Pull down on presser bar (8) to remove.
- (5) Remove presser foot (9) by removing screw (10).

LEGEND:

- | | |
|---------------|-----------------|
| 1. Thumbscrew | 6. Lifter Block |
| 2. Spring | 7. Screw |
| 3. Rod | 8. Presser Bar |
| 4. Guide | 9. Presser Foot |
| 5. Screw | 10. Screw |

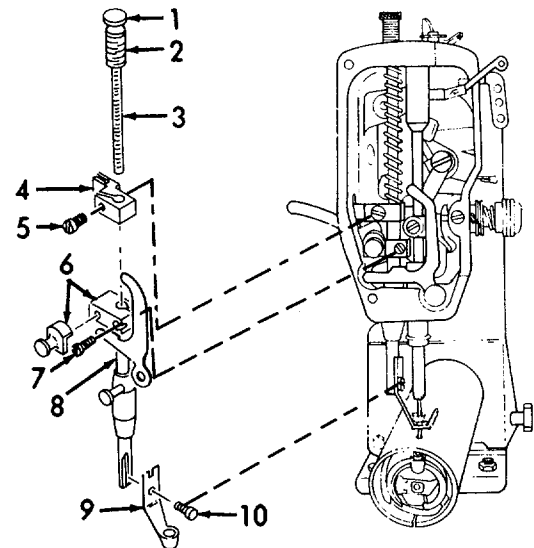


Figure 6-107. Presser Bar, Removal.

- (6) Refer to Figure 6-108. Loosen needle bar connecting stud screw (1) through access hole in rear of head.
- (7) Slide needle bar (2) down and out of needle bar connecting stud assembly (3).
- (8) Remove needle bar (2) and connecting stud assembly (3).

LEGEND:

- | |
|-----------------------------|
| 1. Stud Screw |
| 2. Needle Bar |
| 3. Connecting Stud Assembly |

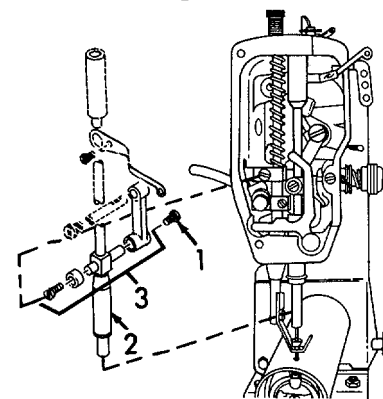


Figure 6-108. Needle Bar Assembly, Removal.

GO TO NEXT PAGE

6-33. NEEDLE BAR AND PRESSER BAR ASSEMBLY MAINTENANCE-Continued.*b. Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth, without disassembling the presser bar guide or presser lifter block assemblies.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix D, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

c. Inspection.

- (1) Inspect hardware for damage.
- (2) Inspect presser bar and foot for damage.
- (3) Inspect presser bar guide assembly for damage.
- (4) Inspect presser lifter block assembly for damage.
- (5) Inspect tension spring for damage or weakness.
- (6) Inspect needle bar for damage.
- (7) Inspect needle bar connecting stud for damage.

- d. Repair.* Repair is limited to the replacement of defective components or assemblies.

GO TO NEXT PAGE

6-33. NEEDLE BAR AND PRESSER BAR ASSEMBLY MAINTENANCE-Continued.

e. *Installation (Refer to Figures 6-109 and 6-110).*

- (1) Refer to Figure 6-109. Slide needle bar (2) through needle bar bottom bushing (4) and then slide needle bar connecting stud assembly (3) over needle bar.
- (2) Slide needle bar up through needle bar upper bushing (5) until 2-3/8 inch (6.03 cm) of needle bar extends below bottom bushing (4) with connecting link (6) in full down position.
- (3) Be sure needle bar connecting stud (3) is seated in connecting link (6) and then tighten setscrew (1). Be sure to maintain 2-3/8 inch (6.03 cm) dimension needle bar extension.

LEGEND:

- | | |
|------------------|------------|
| 1. Setscrew | 4. Bushing |
| 2. Needle Bar | 5. Bushing |
| 3. Stud Assembly | 6. Link |

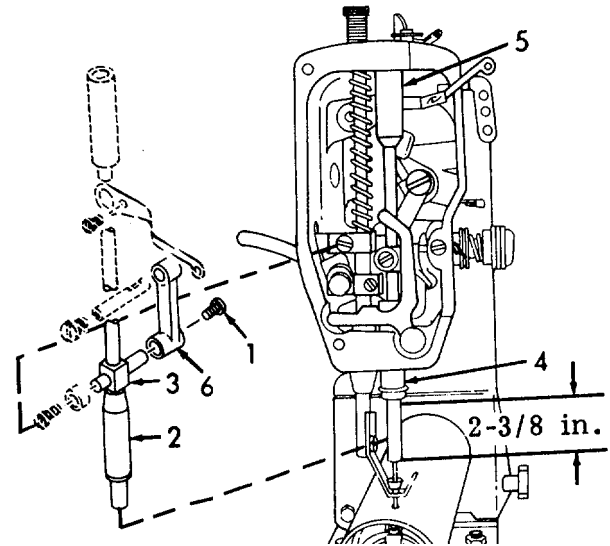


Figure 6-109. Needle Bar Assembly, Installation.

GO TO NEXT PAGE

6-33. NEEDLE BAR AND PRESSER BAR ASSEMBLY MAINTENANCE-Continued.

e. Installation-Continued.

LEGEND:

- | | |
|-------------------|-------------------|
| 1. Thumbscrew | 6. Block Assembly |
| 2. Spring | 7. Screw |
| 3. Spring Rod | 8. Presser Bar |
| 4. Guide Assembly | 9. Presser Foot |
| 5. Screw | 10. Screw |

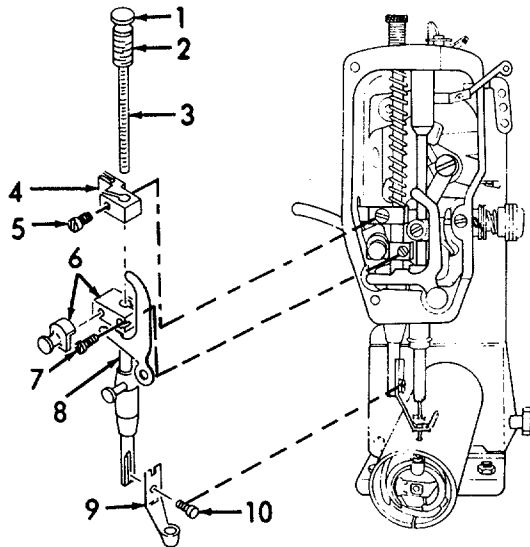


Figure 6-110. Presser Bar, Installation.

f. Adjustment (Refer to Figure 6-111).

LEGEND:

- | | |
|--------------|-----------------|
| 1. Bar Guide | 5. Presser Foot |
| 2. Screw | 6. Latch Guard |
| 3. Block | 7. Needle |
| 4. Screw | 8. Needle Bar |
| | 9. Presser Bar |

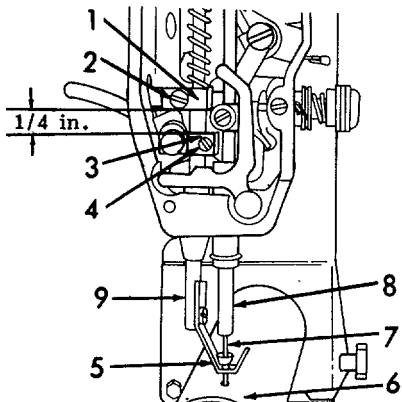


Figure 6-111. Presser Bar Assembly, Adjustment.

END OF TASK

- (4) Refer to Figure 6-110. Install presser foot (9) on presser bar (8) with screw (10).
- (5) Install presser bar (8) through bottom bushing.
- (6) Position presser lifter block assembly (6) and presser bar guide assembly (4) in place and insert presser bar up through both until presser bar is 1/8-inch below the top of presser bar guide assembly.
- (7) Tighten presser bar guide assembly clamp screw (5).
- (8) Insert spring rod (3) into presser bar (8).
- (9) Install tension spring (2) over spring rod (3) and install presser bar tension thumbscrew (1).

- (1) Install latch guard (6) on lower arm.
- (2) Install needle (7) into needle bar (8).
- (3) Adjust presser bar (9) such that needle is precisely centered in hole in presser foot (5).
- (4) Raise presser foot (5).
- (5) Set presser lifter block assembly (3) such that there is 1/4-inch (6.4 mm) between top of block and bottom of presser bar guide assembly (1).
- (6) Recheck adjustment and tighten setscrews (2) and (4).

6-34. PULLEY MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Equipment
Condition

Para.

2-13

Condition Description

Electrical power
removed.

Test Equipment

None

2-9

Drive belts removed.

Special Tools

None

Special Environmental Conditions

None

Materials/Parts

Cleaning Solvent
(Appendix E, item 2)
Cloth, Soft, Lint-Free
(Appendix E, item 3)
Brush, Medium Bristle
(Appendix E, item 1)

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-34. PULLEY MAINTENANCE -Continued.

a. *Removal (Refer to Figure 6.-712).*

LEGEND:

1. Setscrew
2. Pulley

- (1) Loosen, but do not remove two setscrews (1), using a 1/8-inch hex allen wrench.
- (2) Slide the pulley (2) off the pulley shaft.

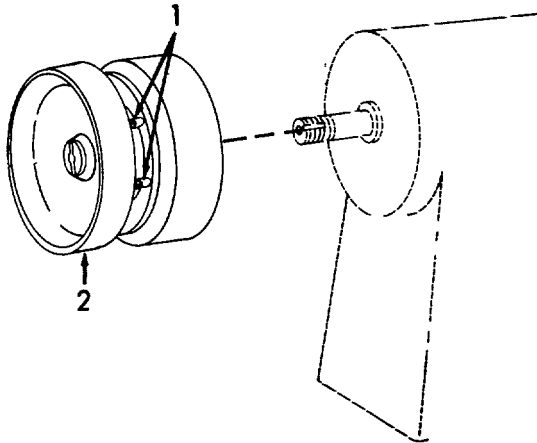


Figure 6-112. Pulley, Removal.

b. *Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

c. *Inspection.*

- (1) Inspect hardware for damage.
- (2) Inspect pulley for damage.

d. *Repair.* No repair of the pulley is authorized.

GO TO NEXT PAGE

6-34. PULLEY MAINTENANCE - Continued.

e. *Installation (Refer to Figure 6-113).*

- (1) Slide the pulley (1) into position on the shaft. Be sure that the setscrews are aligned with the grooves in the shaft.
- (2) Tighten the setscrews (2) using a 1/8-inch hex allen wrench.

LEGEND:

1. Pulley
2. Setscrew

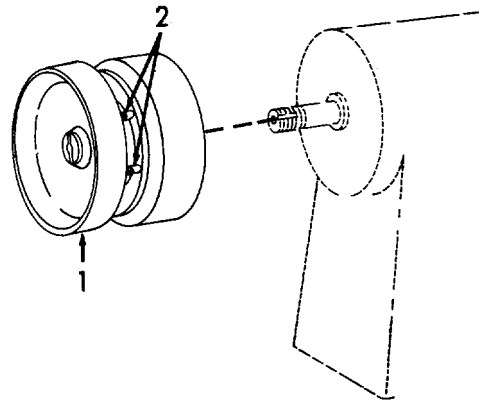


Figure 6-113. Pulley, Installation.

END OF TASK

6-35. UPPER SHAFT ASSEMBLY MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Equipment Condition

Para.

2-13

Condition Description

Electrical power removed.

6-32

Vertical shaft removed.

6-33

Needle bar and presbar assembly removed

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

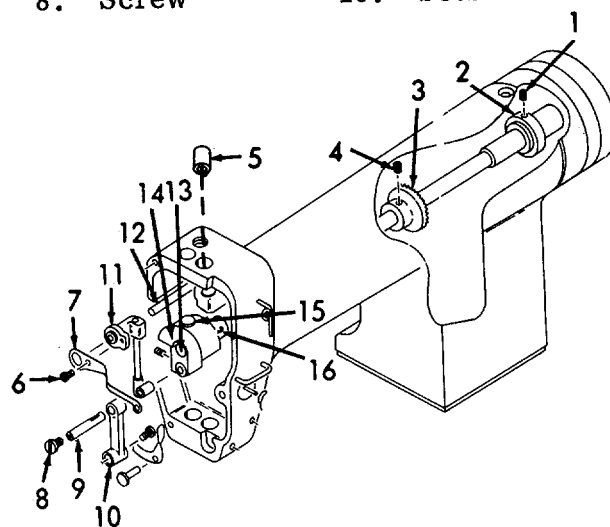
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6-35. UPPER SHAFT ASSEMBLY MAINTENANCE -Continued.**a. Removal (Refer to Figure 6-114).**

- (1) Loosen two setscrews (1) (do not remove) in top shaft rear bushing (2) and remove bushing.
- (2) Loosen two setscrews (4) (do not remove) in top shaft gear (3).
- (3) Remove needle bar front bushing (5).
- (4) Remove screw (6) and remove take-up lever (7).
- (5) Remove screw (8) and remove crank stud (9) and needle bar link (10).
- (6) Remove take-up fulcrum (11) from take-up fulcrum stud (12).

LEGEND:

1. Setscrew	9. Crank
2. Bushing	10. Link
3. Gear	11. Fulcrum
4. Setscrew	12. Stud
5. Bushing	13. Shaft
6. Screw	14. Crank
7. Lever	15. Setscrew
8. Screw	16. Setscrew

**Figure 6-114. Upper Shaft Assembly, Removal.**

- (7) Pull upper shaft assembly (13) forward and out of upper arm.
- (8) Loosen crank (14), setscrew (15), setscrew (16), and remove crank from upper shaft assembly.

b. Cleaning.

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-35. UPPER SHAFT ASSEMBLY MAINTENANCE - Continued.

b. Cleaning - Continued.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

c. Inspection.

- (1) Inspect hardware for damage.
- (2) Inspect top shaft rear bushing for damage.
- (3) Inspect top shaft gear for damage.
- (4) Inspect take-up lever and fulcrum for damage.
- (5) Inspect crank stud, crank, and needle bar link for damage.
- (6) Inspect upper shaft for damage.

d. Repair. Repair is limited to the replacement of defective components.

e. Installation (Refer to Figure 6-115).

LEGEND:

- | | |
|-------------|--------------|
| 1. Setscrew | 9. Crank |
| 2. Bushing | 10. Link |
| 3. Gear | 11. Fulcrum |
| 4. Setscrew | 12. Stud |
| 5. Bushing | 13. Shaft |
| 6. Screw | 14. Crank |
| 7. Lever | 15. Setscrew |
| 8. Screw | 16. Setscrew |
| | 17. Shaft |

- (1) Install crank (14) flush with end of upper shaft assembly (13) and tighten setscrews (15) and (16).

NOTE

Be sure the setscrew is in the hole in the shaft.

- (2) Partially insert upper shaft (13) into crank (14), then install top shaft gear (3) onto upper shaft (13). Then complete installation of upper shaft through hole in rear of upper arm.
- (3) Install top shaft rear bushing (2) onto upper shaft. Push upper shaft as far to the rear as possible, and then tighten two setscrews (1) in rear bushing (2) to prevent forward or reverse motion of upper shaft.

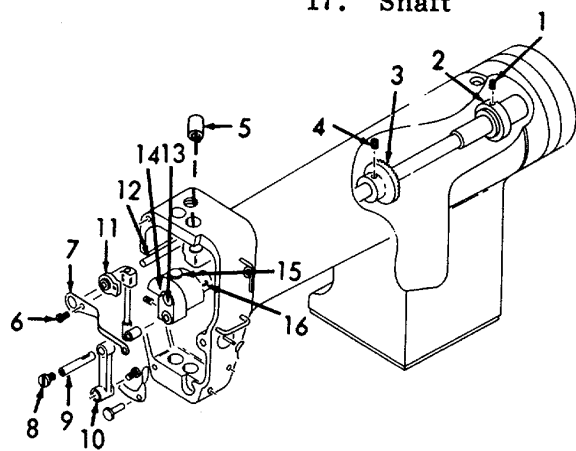


Figure 6-115. Upper Shaft Assembly, Installation.

GO TO NEXT PAGE

6-35. UPPER SHAFT ASSEMBLY MAINTENANCE -Continued.

e. *Installation - Continued.*

- (4) Install take-up lever fulcrum (11) and secure with take-up fulcrum stud (12).
- (5) Install needle bar link (10) and install into position with crank stud (9) and screw (8).
- (6) Install take-up lever (7) and secure with screw (6).
- (7) Install needle bar front bushing (5) with flat to rear.

END OF TASK

6-36. MACHINE TIMING.

This task covers:
Machine Timing

INITIAL SETUP

Applicable Configuration
All

Test Equipment
None

Special Tools
None

Materials/Parts
None

Personnel Required
1 Person

Equipment
Condition

<u>Para.</u>	<u>Condition Description</u>
2-13	Electrical power removed.
6-30	Face plate removed.
6-31	Latch guard removed.

Special Environmental Conditions
None

General Safety Instructions
None

GO TO NEXT PAGE

6-36. MACHINE TIMING - Continued.

Machine Timing, Needle to Hook (Refer to Figure 6-116).

LEGEND:

- | | |
|----------------|-----------|
| 1. Timing Mark | 6. Hook |
| 2. Crank | 7. Shaft |
| 3. Pin | 8. Needle |
| 4. Hook | 9. Bar |
| 5. Setscrew | 10. Case |

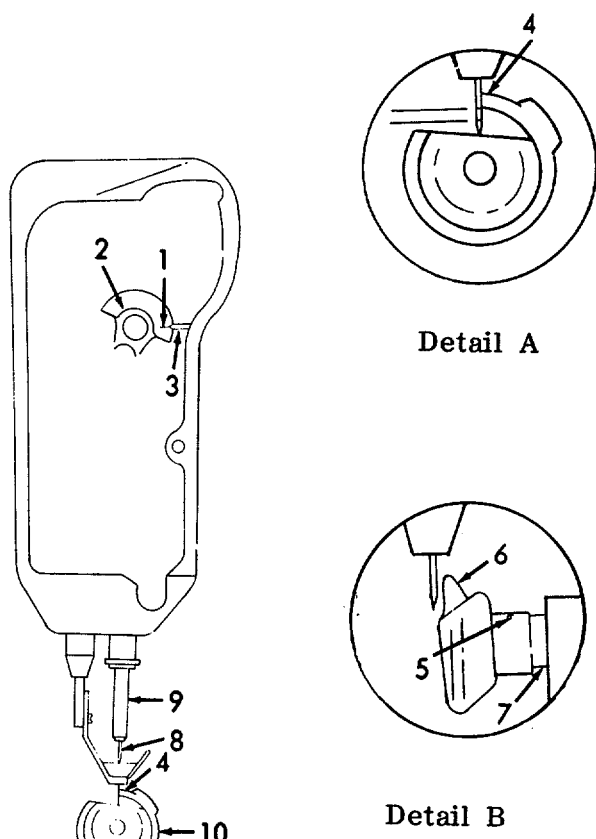


Figure 6-116. Machine Timing.

- (1) Make sure needle (8) is correctly inserted into needle bar (9) as far as possible and that needle goes through the hole in the bobbin case (10).
- (2) Using hand, rotate machine pulley toward you until timing mark (1) on crank (2) is directly in line with timing pin (3) as shown.
- (3) At this time the point of the hook (4) should be at the center line of the needle and 1/16-inch above the needle eye as shown in Detail A, and at the center of the needle scarf in the needle as shown in Detail B.
- (4) Loosen three setscrews (5, Detail B) and turn hook (6) to the left or right on hook shaft (7) the desired amount.
- (5) Now check for 1/64-inch clearance between scarf in needle and the point of hook (6) as shown in Detail B.

END OF TASK

6-37. ELECTRIC MOTOR MAINTENANCE.

For maintenance of the electric motor, refer to paragraph 6-27.

SECTION V. MAINTENANCE OF BUTTON SEWING MACHINE

	Para.		Para.
Automatic Thread Locking		Machine Timing.....	6-49
Mechanism Maintenance.....	6-45	Needle Bar Drive Mechanism	
Button Clamp Maintenance	6-41	Maintenance	6-43
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Foot Treadle Lever Assemblies Maintenance	6-42	Maintenance	6-51
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Looper and Finger Mechanism Maintenance	6-46	Maintenance.....	6-39

6-38. GENERAL.

This section contains information on the removal, disassembly, cleaning, inspection, repair, assembly, installation, and adjustment of the various parts of the button sewing machine.

6-39. THREAD TENSIONERS AND THREAD GUIDES MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Equipment
Condition

Para.

2-14

Condition Description

Electrical power
removed.

2-14

Thread and needle
removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-39. THREAD TENSIONERS AND THREAD GUIDES MAINTENANCE - Continued.

a. Removal (Refer to Figures 6-117 through 6-119).

- (1) Refer to Figure 6-117. Loosen setscrew (1) and remove knurled nut (2).
- (2) Remove spring (3).
- (3) Remove keeper (4) and felt pad (5).
- (4) Remove upper and lower tension discs (6 and 7).
- (5) Remove two screws (8) and plate (9).
- (6) Remove nut (10), pin (11), plate (9), and stud (12).
- (7) Remove thread guide (13).

LEGEND:

- | | |
|-----------------------|------------------|
| 1. Setscrew | 8. Screw |
| 2. Nut | 9. Plate |
| 3. Spring | 10. Nut |
| 4. Keeper | 11. Pin |
| 5. Pad | 12. Stud |
| 6. Upper Tension Disc | 13. Thread Guide |
| 7. Lower Tension Disc | |

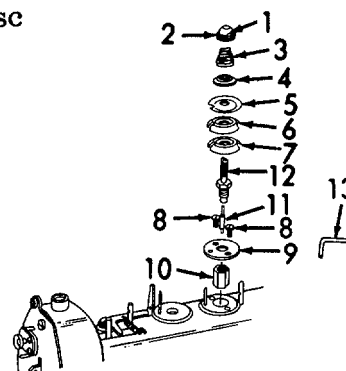


Figure 6-117. Rear Thread Tensioner and Thread Guide, Removal.

- (8) Refer to Figure 6-118. Remove knurled nut (1).
- (9) Remove spring (2).
- (10) Remove upper and lower tension discs (3 and 4).
- (11) Remove stud (5).

LEGEND:

- | | |
|-----------------|-----------------|
| 1. Nut | 4. Tension Disc |
| 2. Spring | 5. Stud |
| 3. Tension Disc | |

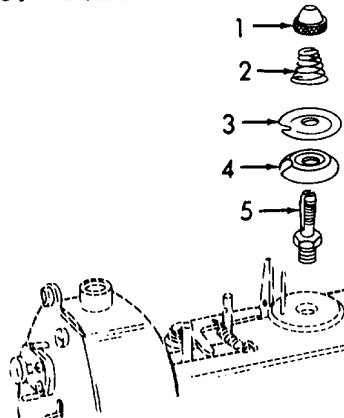


Figure 6-118. Front Thread Tensioner, Removal.

GO TO NEXT PAGE

6-39. THREAD TENSIONERS AND THREAD GUIDES MAINTENANCE - Continued.

a. Removal - Continued.

LEGEND:

- | | |
|----------|-----------|
| 1. Post | 4. Washer |
| 2. Screw | 5. Spring |
| 3. Lever | |

- (12) Refer to Figure 6-119. Remove spring post (1).
- (13) Remove screw (2), lever (3), and washer (4).
- (14) Remove spring (5).

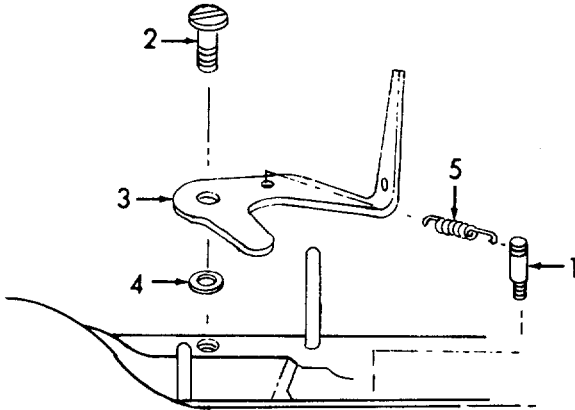


Figure 6-119. Front Thread Tension Lever, Removal.

b. Cleaning.

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

GO TO NEXT PAGE

6-39. THREAD TENSIONERS AND THREAD GUIDES MAINTENANCE - Continued.

c. Inspection.

- (1) Inspect hardware for damage.
- (2) Inspect for broken spring.
- (3) Inspect for damaged tension discs.
- (4) Inspect for damaged pins.
- (5) Inspect for damaged plate.
- (6) Inspect for damaged lever.

d. Repair. Repair of the thread tensioners and thread guides is limited to the replacement of defective components.

e. Installation (Refer to Figures 6-120 through 6-122).

- (1) Refer to Figure 6-120. Install thread guide (1).
- (2) Install to stud (2): plate (3), pin (4), and nut (5).
- (3) Install plate (3) and two screws (6).
- (4) Install lower and upper tension discs (7 and 8).
- (5) Install felt pad (9) and keeper (10).
- (6) Install spring (11).
- (7) Install knurled nut (12) and tighten setscrew (13).

LEGEND:

- | | |
|-----------------|-----------------|
| 1. Thread Guide | 8. Tension Disc |
| 2. Stud | 9. Pad |
| 3. Plate | 10. Keeper |
| 4. Pin | 11. Spring |
| 5. Nut | 12. Nut |
| 6. Screw | 13. Setscrew |
| 7. Tension Disc | |

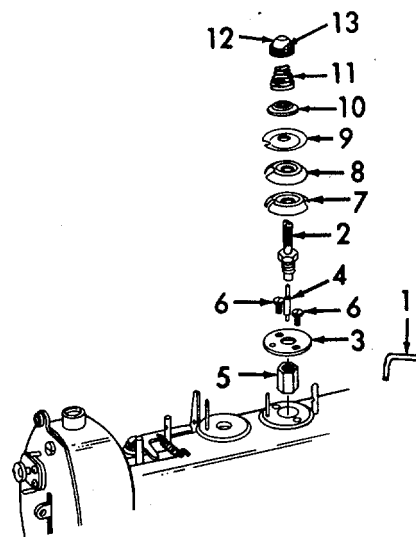


Figure 6-120. Rear Thread Tensioner and Thread Guide, Installation.

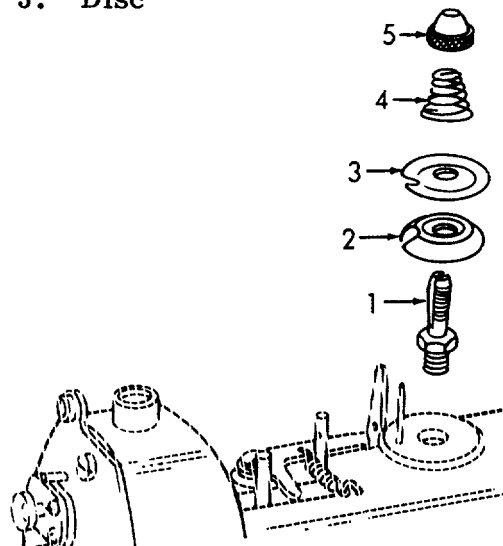
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6-39. THREAD TENSIONERS AND THREAD GUIDES MAINTENANCE- Continued.

e. Installation - Continued.

LEGEND:

- | | |
|---------|-----------|
| 1. Stud | 4. Spring |
| 2. Disc | 5. Nut |
| 3. Disc | |

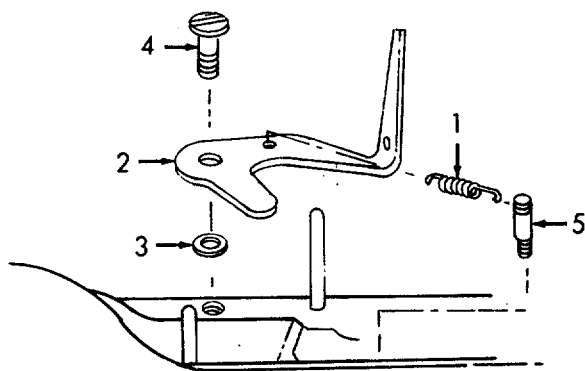


- (8) Refer to Figure 6-121. Install stud (1).
- (9) Install lower and upper discs (2 and 3).
- (10) Install spring (4).
- (11) Install knurled nut (5).

Figure 6-121. Front Thread Tensioner, Installation.

LEGEND:

- | | |
|-----------|----------|
| 1. Spring | 4. Screw |
| 2. Lever | 5. Post |
| 3. Washer | |



- (12) Refer to Figure 6-122. Install spring (1) to lever (2).
- (13) Install washer (3), lever (2), and screw (4).
- (14) Install spring post (5) and connect spring to post.

Figure 6-122. Front Thread Tension Lever, Installation.

END OF TASK

6-40. FACE PLATE MAINTENANCE.

This task covers:

- | | | | |
|------------|----------------|-----------------|---------------|
| a. Removal | b. Disassembly | c. Cleaning | d. Inspection |
| e. Repair | f. Assembly | g. Installation | |
-

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Equipment
Condition

Para.

2-9

Condition Description

Electrical power
removed.

2-14

Thread and needle
removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-40. FACE PLATE MAINTENANCE - Continued.

a. *Removal (Refer to Figure 6-123).*

LEGEND:

- 1. Screw
- 2. Face Plate

- (1) Remove two screws (1).
- (2) Remove face plate (2).

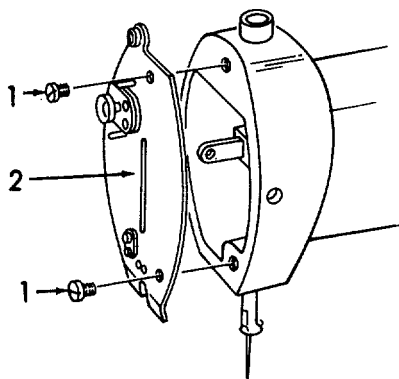


Figure 6-123. Face Plate, Removal.

b. *Disassembly (Refer to Figure 6-124).*

LEGEND:

- | | |
|-----------------|--------------|
| 1. Screw | 9. Screw |
| 2. Tension Disc | 10. Plate |
| 3. Spring | 11. Setscrew |
| 4. Cup | 12. Cap |
| 5. Nut | 13. Spring |
| 6. Screw | 14. Plunger |
| 7. Plate | 15. Spring |
| 8. Nut | 16. Pin |
| | 17. Body |

- (1) Remove screw (1) and tension disc (2), spring (3), and cup (4).
- (2) Remove nut (5), screw (6), and guide plate (7).
- (3) Remove nut (8).
- (4) Remove two screws (9) and plate (10).
- (5) Remove setscrew (11) and cap (12).
- (6) Remove spring (13), plunger (14), spring (15), pin (16), and body (17).

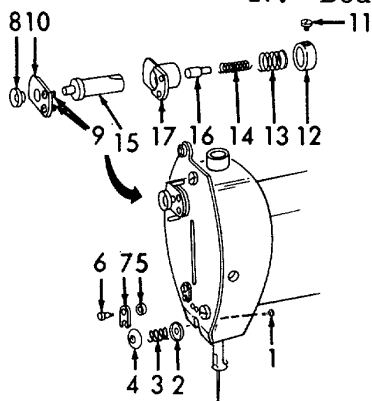


Figure 6-124. Face Plate, Disassembly.

GO TO NEXT PAGE

6-40. FACE PLATE MAINTENANCE - Continued.*c. Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

d. Inspection.

- (1) Inspect for damaged hardware.
- (2) Inspect for damaged face plate.
- (3) Inspect for damaged tension disc.
- (4) Inspect for damaged springs.
- (5) Inspect for damaged plunger and pins.

- e. Repair.* Repair of the face plate is limited to the replacement of defective components.

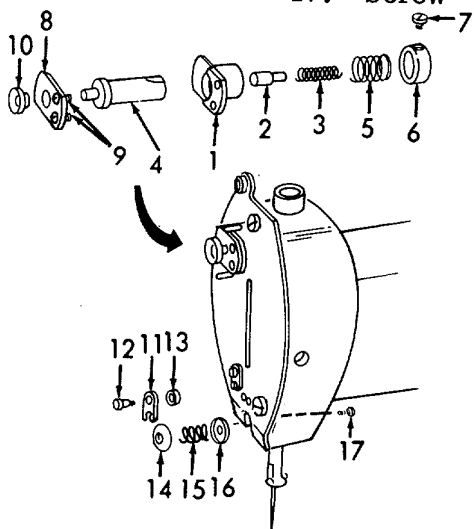
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6-40. FACE PLATE MAINTENANCE - Continued.

f. *Assembly (Refer to Figure 6-125).*

LEGEND:

- | | |
|-------------|------------|
| 1. Body | 9. Screw |
| 2. Pin | 10. Nut |
| 3. Spring | 11. Plate |
| 4. Plunger | 12. Screw |
| 5. Spring | 13. Nut |
| 6. Cap | 14. Cup |
| 7. Setscrew | 15. Spring |
| 8. Plate | 16. Disc |
| | 17. Screw |



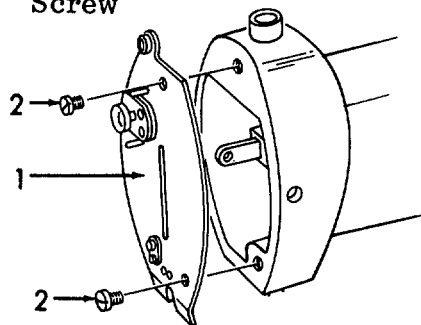
- (1) Install body (1), pin (2), spring (3), plunger (4), and spring (5).
- (2) Install cap (6) and setscrew (7).
- (3) Install plate (8), two screws (9), and nut (10).
- (4) Install guide plate (11), screw (12), and nut (13).
- (5) Install cup (14), spring (15), tension disc (16), and screw (17).

Figure 6-125. Face Plate, Assembly.

g. *Installation (Refer to Figure 6-126).*

LEGEND:

1. Face Plate
2. Screw



- (1) Install face plate (1) into position.
- (2) Install two screws (2).

Figure 6-126. Face Plate, Installation.

END OF TASK

6-41. BUTTON CLAMP MAINTENANCE.

This task covers:

- a. Removal
- b. Cleaning
- c. Inspection
- d. Repair
- e. Installation

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Equipment
Condition

Para.

2-9

Condition Description

Electrical power
removed.

2-14

Thread and needle
removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-41. BUTTON CLAMP MAINTENANCE - Continued.

a. *Removal (Refer to Figure 6-127).*

LEGEND:

- | | |
|----------|----------|
| 1. Nut | 3. Pin |
| 2. Screw | 4. Clamp |

- (1) Remove nut (1) and screw (2).
- (2) Remove pin (3).
- (3) Remove button clamp (4).

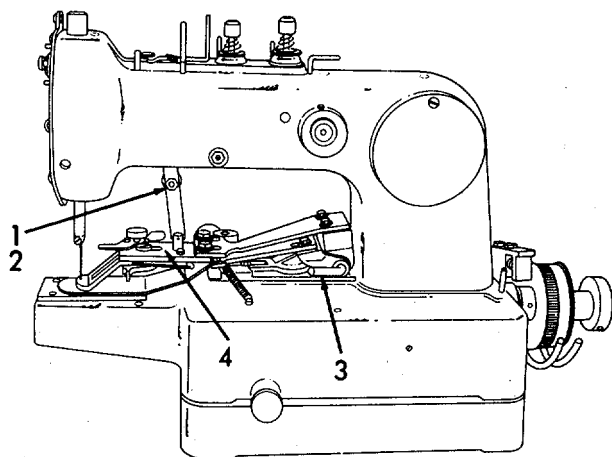


Figure 6-127. Button Clamp, Removal.

b. *Disassembly. Do not disassemble clamp assembly.*

**Figure 6-128. and
Figure 6-129. are deleted.**

c. *Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

GO TO NEXT PAGE

6-41. BUTTON CLAMP MAINTENANCE - Continued.*d. Inspection.*

- (1) Inspect for damaged hardware.
- (2) Inspect for damaged arms.
- (3) Inspect for damaged levers.
- (4) Inspect for damaged brackets.
- (5) Inspect for damaged bushings.
- (6) Inspect for damaged spring.
- (7) Inspect for damaged connecting rod.
- (8) Inspect for damaged clips.

**Figure 6-130. And
Figure 6-131 are deleted.**

e. Installation (Refer to Figure 6-132).

- (1) Place button clamp (1) into position.
- (2) Install pin (2).
- (3) Install screw (3) and nut (4).

LEGEND:

- | | |
|----------|----------|
| 1. Clamp | 3. Screw |
| 2. Pin | 4. Nut |

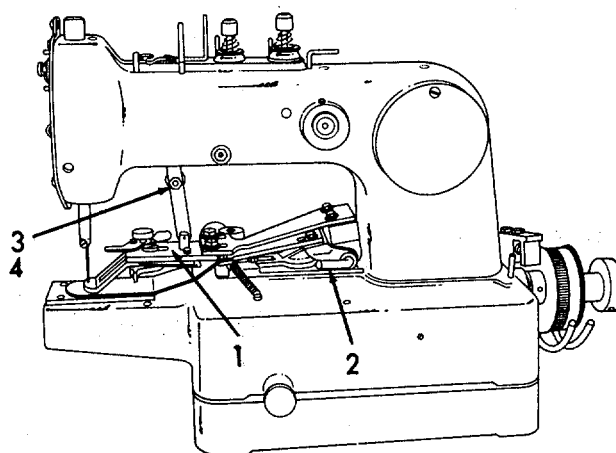


Figure 6-132. Button Clamp, Installation.

END OF TASK

All data on pages 6-130 and 6-131 deleted.

6-41. BUTTON CLAMP MAINTENANCE - Continued.

f. Assembly - Continued.

- (5) Refer to Figure 6-131. Install clamp assembly (1) into position on arm assembly (2).
- (6) Install two washers (3), two lockwashers (4), and two screws (5).

LEGEND:

- 1. Clamp Assembly
- 2. Arm Assembly
- 3. Washer
- 4. Lockwasher
- 5. Screws

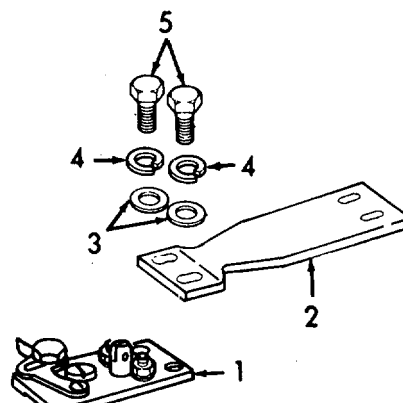


Figure 6-131. Clamp and Arm Assemblies, Assembly.

g. Installation (Refer to Figure 6-132).

- (1) Place button clamp (1) into position.
- (2) Install pin (2).
- (3) Install screw (3) and nut (4).

LEGEND:

- 1. Clamp
- 2. Pin
- 3. Screw
- 4. Nut

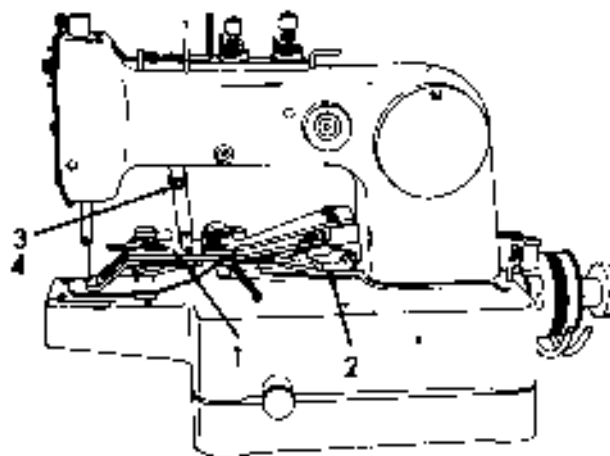


Figure 6-132. Button Clamp, Installation.

END OF TASK

6-42. FOOT TREADLE LEVER ASSEMBLIES MAINTENANCE.

This task covers:

- a. Removal
 - b. Cleaning
 - c. Inspection
 - d. Repair
 - e. Installation
-

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Equipment
Condition

Para.

2-9

Condition Description

Electrical power
removed.

2-14

Thread and needle
removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

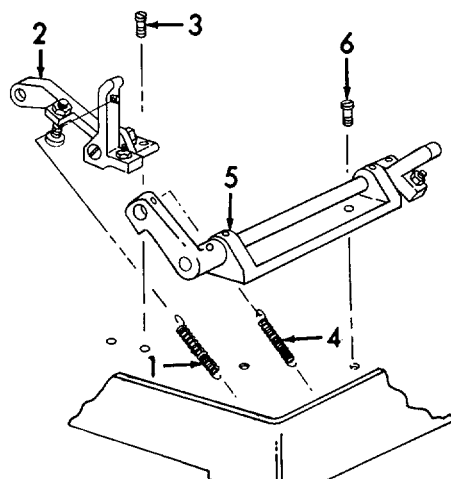
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6-42. FOOT TREADLE LEVER ASSEMBLIES MAINTENANCE - Continued.*a. Removal (Refer to Figure 6-133).*

- (1) Disconnect spring (1) from the foot starter lever assembly (2).
- (2) Remove two screws (3) and remove the foot starter lever assembly (2).
- (3) Disconnect spring (4) from clamp lifter assembly (5).
- (4) Remove two screws (6) and remove the clamp lifter assembly (5).

LEGEND:

- | | |
|-----------------------------------|-------------------------|
| 1. Spring | 4. Spring |
| 2. Foot Starter
Lever Assembly | 5. Lifter As-
sembly |
| 3. Screw | 6. Screw |

**Figure 6-133. Foot Treadle Lever Assemblies, Removal.***b. Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

GO TO NEXT PAGE

6-42. FOOT TREADLE LEVER ASSEMBLIES MAINTENANCE - Continued.

c. Inspection.

- (1) Inspect for damaged hardware.
- (2) Inspect for broken spring.
- (3) Inspect for damaged lever.

d. Repair. Repair of the foot treadle lever assemblies is limited to the replacement of defective components.

e. Installation (Refer to Figure 6-134).

LEGEND:

- | | |
|---------------------------|------------------|
| 1. Lever Assembly | 4. Screw |
| 2. Screw | 5. Spring |
| 3. Lifter Assembly | 6. Spring |

- (1) Install foot starter lever assembly (1) into position and secure with two screws (2).
- (2) Install clamp lifter assembly (3) into position and secure with two screws (4).
- (3) Install spring (5) to foot starter lever assembly (2).

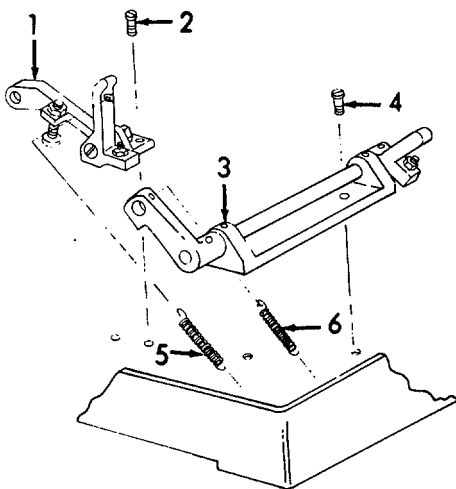


Figure 6-134. Foot Treadle Lever Assemblies, Installation.

END OF TASK

6-43. NEEDLE BAR DRIVE MECHANISM MAINTENANCE.

This task covers:

- a. Removal
 - b. Cleaning
 - c. Inspection
 - d. Repair
 - e. Installation
-

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

None

Materials/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Equipment
Condition

Para.

2-9

Condition Description

Electrical power
removed.

2-14

Thread and needle
removed.

6-40

Face Plate Removed

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-43. NEEDLE BAR DRIVE MECHANISM MAINTENANCE - Continued.

a. Removal (Refer to Figures 6-135 and 6-136).

LEGEND:

- | | |
|---------------|--------------|
| 1. Screw | 12. Clamp |
| 2. Setscrew | 13. Screw |
| 3. Needle Bar | 14. Link |
| 4. Bolt | 15. Nut |
| 5. Arm | 16. Setscrew |
| 6. Stud | 17. Setscrew |
| 7. Setscrew | 18. Plunger |
| 8. Stud | 19. Setscrew |
| 9. Arm | 20. Bushing |
| 10. Nut | 21. Bushing |
| 11. Screw | 22. Bushing |

- (1) Refer to Figure 6-135. Remove screw (1).
- (2) Loosen setscrew (2) and slide needle bar (3) out top of arm.
- (3) Remove bolt (4) and slide connecting arm (5) off pivot stud (6).
- (4) Remove two setscrews (7).
- (5) Remove stud (8).
- (6) Remove rocker arm (9) out front of arm.
- (7) Remove nut (10), screw (11), and clamp (12).

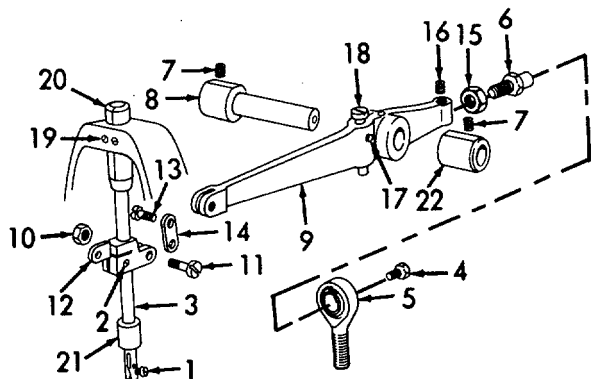


Figure 6-135. Needle Bar Drive Mechanism, Removal.

- (8) Remove screw (13) and link (14).
- (9) Loosen nut (15), setscrew (16), and remove stud (6).
- (10) Loosen setscrew (17) and remove plunger (18).
- (11) Loosen setscrew (19) and remove bushing (20).
- (12) Remove bushing (21) and bushing (22).

GO TO NEXT PAGE

6-43. NEEDLE BAR DRIVE MECHANISM MAINTENANCE - Continued.

a. *Removal - Continued.*

- (13) Refer to Figure 6-136. Remove two screws (1) and connecting rod bottom section (2).
- (14) Remove connecting rod assembly (3), do not disassemble.

LEGEND:

- | | |
|-----------------|---------------------|
| 1. Screw | 5. Ball Joint |
| 2. Rod Bottom | 6. Pin |
| 3. Rod Assembly | 7. Rod |
| 4. Nut | 8. Bearing Assembly |

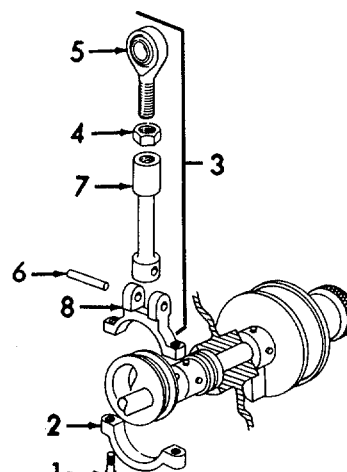


Figure 6-136. Connecting Rod, Removal.

b. *Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

GO TO NEXT PAGE

6-43. NEEDLE BAR DRIVE MECHANISM MAINTENANCE - Continued.

c. Inspection.

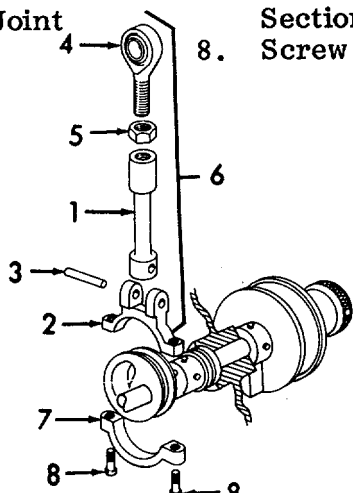
- (1) Inspect for damaged hardware.
- (2) Inspect for damaged needle bar.
- (3) Inspect for damaged studs.
- (4) Inspect for damaged pivot arm.
- (5) Inspect for damaged clamps.
- (6) Inspect for damaged link.
- (7) Inspect for damaged bushings.
- (8) Inspect for damaged connecting rod and bearing sections.
- (9) Inspect for damaged ball joint.

d. Repair. Repair of the needle bar drive mechanism is limited to the replacement of defective components.

e. Installation (Refer to Figures 6-137 and 6-138).

LEGEND:

- | | |
|--------------------------|--------------------------|
| 1. Rod | 5. Nut |
| 2. Bearing As-
sembly | 6. Rod Assem-
bly |
| 3. Pin | 7. Rod Bottom
Section |
| 4. Ball Joint | 8. Screw |



- (1) Refer to Figure 6-137. Install connecting rod assembly (6).
- (2) Install connecting rod bottom section (7) and secure with two screws (8).

Figure 6-137. Connecting Rod, Installation.

GO TO NEXT PAGE

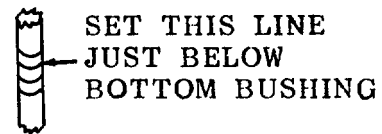
6-43. NEEDLE BAR DRIVE MECHANISM MAINTENANCE - Continued.

e. Installation - Continued.

- (3) Refer to Figure 6-138. Install bushing (1) and bushing (2).
- (4) Install bushing (3) and tighten setscrew (4).
- (5) Install plunger (5) and tighten setscrew (6).
- (6) Install stud (7) and tighten set screw (8) and nut (9).
- (7) Install link (10) and screw (11).
- (8) Install clamp (12), screw (13), and nut (14).
- (9) Install rocker arm (15) through front of arm.

LEGEND:

- | | |
|-------------|----------------|
| 1. Bushing | 12. Clamp |
| 2. Bushing | 13. Screw |
| 3. Bushing | 14. Nut |
| 4. Setscrew | 15. Rocker Arm |
| 5. Plunger | 16. Stud |
| 6. Setscrew | 17. Setscrew |
| 7. Stud | 18. Arm |
| 8. Setscrew | 19. Screw |
| 9. Nut | 20. Needle Bar |
| 10. Link | 21. Setscrew |
| 11. Screw | 22. Screw |



DETAIL "A"

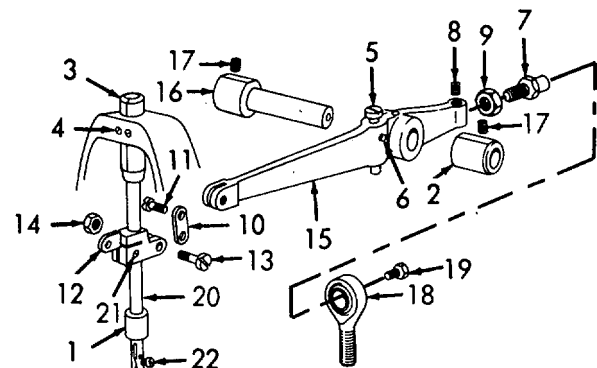


Figure 6-138. Needle Bar Drive Mechanism, Installation.

NOTE

If the clamp lift linkage was removed, install it before going any further.

- (10) Install stud (16).
- (11) Install two setscrews (17).
- (12) Install connecting arm (18) to pivot stud (7).
- (13) Install screw (19).

- (14) Install needle bar (20) through top of arm. Turn the main shaft until the needle bar is at its lowest point and then set the needle bar as shown in Detail A of Figure 6-156. Tighten setscrew (21).
- (15) Install screw (22).

END OF TASK

6-44. CLAMP LIFT AND THREAD SLACK MECHANISM MAINTENANCE.

This task covers:

- | | | |
|------------|-----------------|---------------|
| a. Removal | b. Cleaning | c. Inspection |
| d. Repair | e. Installation | |
-

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material/Parts

- Cleaning Solvent
(Appendix E, item 2)
- Cloth, Soft, Lint-Free
(Appendix E, item 3)
- Brush, Medium Bristle
(Appendix E, item 1)

Equipment
Condition

Para.

2-9

2-14

6-40

6-43

Condition Description

- Electrical power removed.
- Thread and needle removed.
- Face plate removed.
- Needle bar drive mechanism removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

**6-44. CLAMP LIFT AND THREAD SLACK MECHANISM
MAINTENANCE- Continued.**

a. Removal (Refer to Figures 6-139 and 6-140).

- (1) Refer to Figure 6-139. Remove spring (1).
- (2) Remove nut (2), nut (3), stud (4) and separate connecting strap (5) from pivot lever (6).
- (3) Remove nut (7), lockwasher (8), flat washer (9), screw (10), and pivot lever (6).
- (4) Refer to Figure 6-140. Remove screw (1) and connecting strap (2).
- (5) Remove screw (3).
- (6) Remove nut (4) and pivot screw (5).
- (7) Remove connecting strap (6) out front of arm.
- (8) Remove nut (7) and connecting stud (8). Separate connecting strap (6) from front segment (9).
- (9) Remove two screws (10) and kick pin support (11).
- (10) Remove nut (12), pivot screw (13), and pivot lever (14).

LEGEND:

- | | |
|-----------|----------------|
| 1. Spring | 6. Lever |
| 2. Nut | 7. Nut |
| 3. Nut | 8. Lockwasher |
| 4. Stud | 9. Flat Washer |
| 5. Strap | 10. Lever |

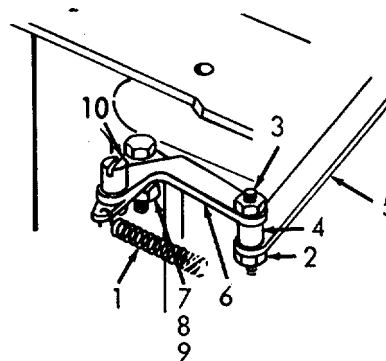


Figure 6-139. Pivot Lever, Removal.

LEGEND:

- | | |
|----------------|-------------|
| 1. Screw | 8. Stud |
| 2. Strap | 9. Segment |
| 3. Screw | 10. Screw |
| 4. Nut | 11. Support |
| 5. Pivot Screw | 12. Nut |
| 6. Strap | 13. Screw |
| 7. Nut | 14. Lever |

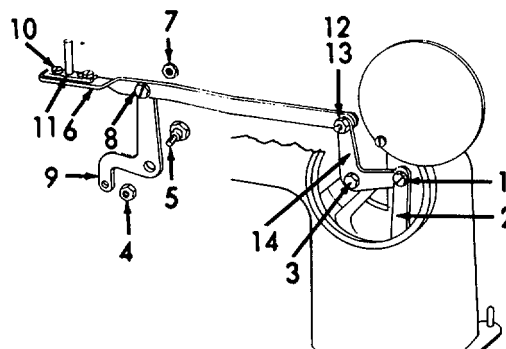


Figure 6-140. Upper Connecting Strap, Removal.

GO TO NEXT PAGE

**6-44. CLAMP LIFT AND THREAD SLACK MECHANISM
MAINTENANCE - Continued.***b. Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

c. Inspection.

- (1) Inspect for damaged hardware.
- (2) Inspect for broken spring.
- (3) Inspect for damaged pivot levers.
- (4) Inspect for damaged connecting straps.
- (5) Inspect for damaged front segment.
- (6) Inspect for damaged kick pin support.

d. Repair. Repair of the clamp lift and thread slack mechanism is limited to the replacement of defective components.

GO TO NEXT PAGE

**6-44. CLAMP LIFT AND THREAD SLACK MECHANISM
MAINTENANCE - Continued.**

e. *Installation (Refer to Figures 6-141 and 6-142).*

(1) Refer to Figure 6-141. Install pivot lever (1), pivot screw (2), and nut (3).

(2) Install kick pin support (4) and two screws (5).

(3) Connect front segment (6) to connecting strap (7).

(4) Install connecting stud (8) and nut (9).

(5) Install connecting strap (7) through front of arm.

(6) Install pivot screw (10) and nut (11).

(7) Install screw (12).

(8) Install connecting strap (13) and screw (14).

(9) Refer to Figure 6-142. Install pivot lever (1), screw (2), flat washer (3), lockwasher (4), and nut (5).

(10) Connect pivot lever (1) and connecting strap (6).

(11) Install stud (7), nut (8), and nut (9).

(12) Install spring (10).

LEGEND:

- | | |
|----------------|-----------|
| 1. Pivot Lever | 8. Stud |
| 2. Screw | 9. Nut |
| 3. Nut | 10. Screw |
| 4. Support | 11. Nut |
| 5. Screw | 12. Screw |
| 6. Segment | 13. Strap |
| 7. Strap | 14. Screw |

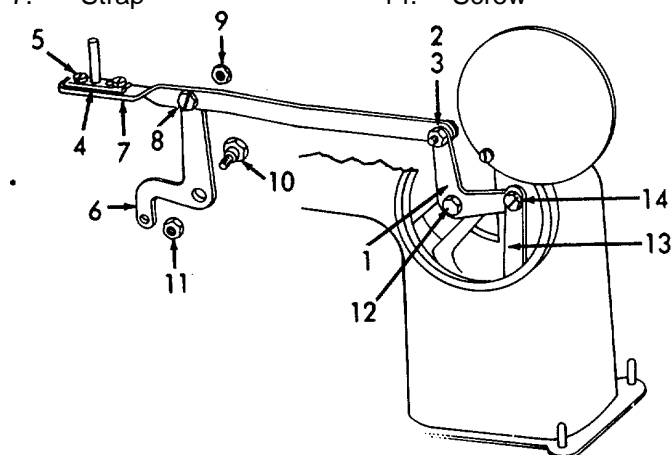


Figure 6-141. Upper Connecting Strap, Installation .

LEGEND:

- | | |
|---------------|------------|
| 1. Lever | 6. Strap |
| 2. Screw | 7. Stud |
| 3. Washer | 8. Nut |
| 4. Lockwasher | 9. Nut |
| 5. Nut | 10. Spring |

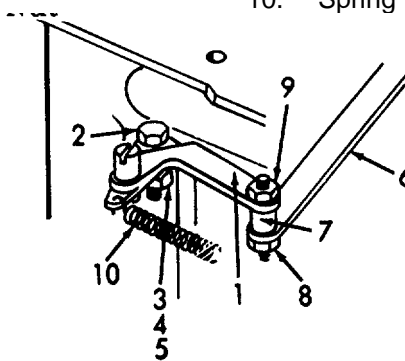


Figure 6-142.

END OF TASK

6-45. AUTOMATIC THREAD LOCKING MECHANISM MAINTENANCE.

This task covers:

- a. Removal
 - b. Cleaning
 - c. Inspection
 - d. Repair
 - e. Installation
-

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Equipment Condition

Para.

2-9

2-14

6-40

6-43

Condition Description

Electrical power removed.

Thread and needle removed.

Face plate removed.

Needle bar drive mechanism removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

**6-45. AUTOMATIC THREAD LOCKING MECHANISM
MAINTENANCE - Continued.**

a. Removal (Refer to Figures 6-143 and 6-144).

- (1) Refer to Figure 6-143. Remove C-washer (1) and pin (2).
- (2) Remove spring (3) and lock finger (4).

LEGEND:

- | | |
|-------------|-----------|
| 1. C-Washer | 3. Spring |
| 2. Pin | 4. Finger |

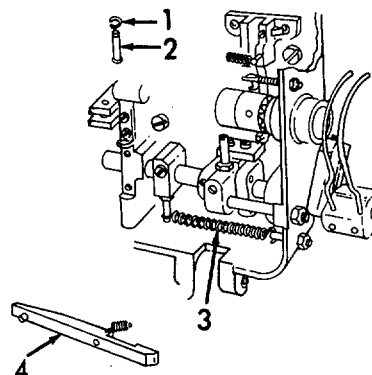


Figure 6-143. Thread Lock Finger, Removal

- (3) Refer to Figure 6-144. Remove screw (1).
- (4) Remove connecting strap (2).
- (5) Remove screw (3).
- (6) Loosen two setscrews (7) and remove connector block (8) from push rod (4).
- (7) Remove push rod (4) out front of arm.
- (8) Remove stud (5) and separate pivot lever (6) from push rod (4).

LEGEND:

- | | |
|----------|-------------|
| 1. Screw | 5. Stud |
| 2. Strap | 6. Lever |
| 3. Screw | 7. Setscrew |
| 4. Rod | 8. Block |

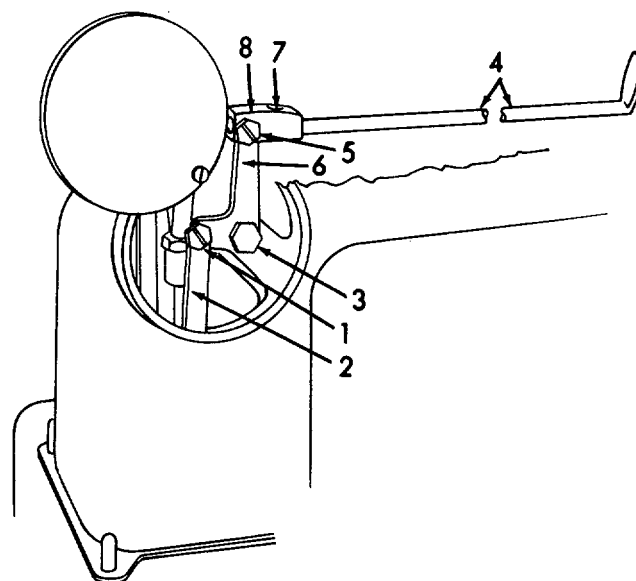


Figure 6-144. Push Rod and Pivot Lever, Removal

GO TO NEXT PAGE

**6-45. AUTOMATIC THREAD LOCKING MECHANISM
MAINTENANCE - Continued.***b. Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

c. Inspection.

- (1) Inspect for damaged hardware.
- (2) Inspect for damaged springs.
- (3) Inspect for damaged lock finger.
- (4) Inspect for damaged pin.
- (5) Inspect for damaged connecting strap.
- (6) Inspect for damaged push rod.
- (7) Inspect for damaged connector block.
- (8) Inspect for damaged pivot lever.

d. Repair. Repair of the automatic thread locking mechanism is limited to the replacement of defective components.

GO TO NEXT PAGE

**6-45. AUTOMATIC THREAD LOCKING MECHANISM
MAINTENANCE - Continued.**

e. *Installation (Refer to Figures 6-145 and 6-146).*

- (1) Refer to Figure 6-145. Install push rod (2) through front of arm.
- (2) Install connector block (1) to push rod (2).
- (3) Tighten two setscrews (3).
- (4) Connect push rod (2) to pivot lever (4) and install stud (5).
- (5) Install screw (6).
- (6) Install connecting strap (7).
- (7) Install screw (8).

LEGEND:

- | | |
|-------------|----------|
| 1. Block | 5. Stud |
| 2. Rod | 6. Screw |
| 3. Setscrew | 7. Strap |
| 4. Lever | 8. Screw |

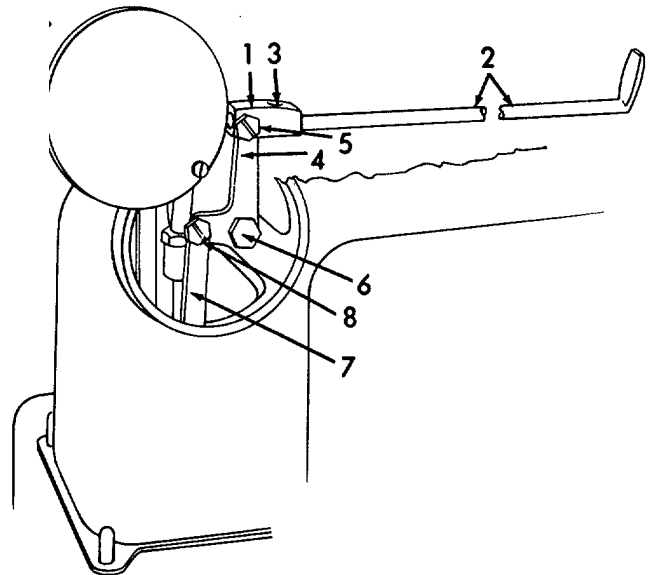


Figure 6-145. Push Rod and Pivot Lever, Installation .

- (8) Refer to Figure 6-146. Place lock finger (1) into position.
- (9) Install pin (2) and C-washer (3).
- (10) Install spring (4).

LEGEND:

- | | |
|-----------|-------------|
| 1. Finger | 3. C-Washer |
| 2. Pin | 4. Spring |

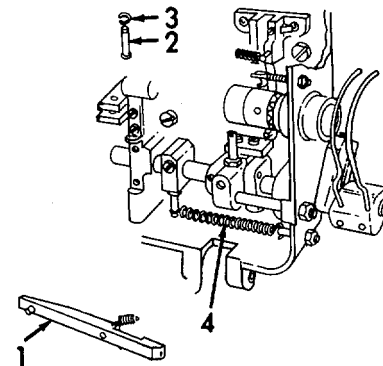


Figure 6-146. Thread Lock Finger, Installation .

END OF TASK

6-46. LOOPER AND FINGER MECHANISM MAINTENANCE.

This task covers:

- | | | |
|------------|-----------------|---------------|
| a. Removal | b. Cleaning | c. Inspection |
| d. Repair | e. Installation | |
-

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Equipment
Condition

Para.

2-9

2-14

Condition Description

Electrical power
removed.

Thread and needle
removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

6-46. LOOPER AND FINGER MECHANISM MAINTENANCE - Continued.

a. Removal (Refer to Figures 6-147 and 6-148).

- (1) Refer to Figure 6-147. Remove four screws (1) and needle plate (2).
- (2) Remove spring (3) and finger guard (4).
- (3) Remove screw (5) and guide block (6).

LEGEND:

- | | |
|-----------|----------|
| 1. Screw | 4. Guard |
| 2. Plate | 5. Screw |
| 3. Spring | 6. Block |

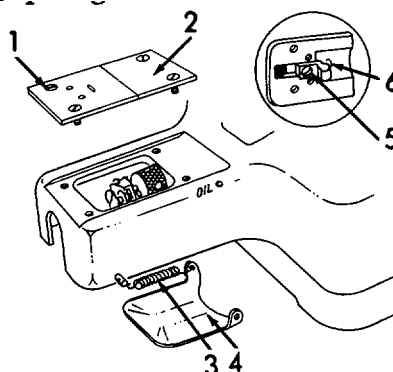


Figure 6-147. Needle Plate and Finger Guard, Removal.

- (4) Refer to Figure 6-148. Loosen setscrew (1) and remove looper (2).
- (5) Remove screw (3) and finger (4).
- (6) Loosen two setscrews (5) and remove looper holder (6).
- (7) Remove spring (7).
- (8) Loosen setscrew (8) and remove cam roller holder (9).
- (9) Loosen setscrew (10) and remove cam follower.
- (10) Remove shaft (11).

LEGEND:

- | | |
|-------------|-------------|
| 1. Setscrew | 7. Spring |
| 2. Looper | 8. Setscrew |
| 3. Screw | 9. Roller |
| 4. Finger | 10. Holder |
| 5. Setscrew | 11. Shaft |
| 6. Holder | |

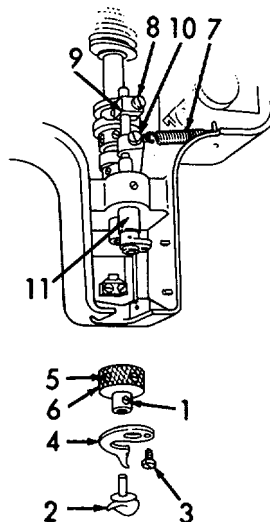


Figure 6-148. Looper and Finger, Removal.

GO TO NEXT PAGE

**6-46. LOOPER AND FINGER MECHANISM MAINTENANCE -
Continued.***b. Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

c. Inspection.

- (1) Inspect for damaged hardware.
- (2) Inspect for damaged needle plate.
- (3) Inspect for damaged springs.
- (4) Inspect for damaged finger guide.
- (5) Inspect for damaged guide block.
- (6) Inspect for damaged looper.
- (7) Inspect for damaged finger.
- (8) Inspect for damaged looper holder.
- (9) Inspect for damaged cam roller holder.
- (10) Inspect for damaged cam follower.

d. Repair. Repair of the looper and finger mechanism is limited to the replacement of defective components.

GO TO NEXT PAGE

6-46. LOOPER AND FINGER MECHANISM MAINTENANCE - Continued.

e. *Installation (Refer to Figures 6-149 and 6-150).*

- (1) Refer to Figure 6-149. Install shaft (12).
- (2) Install cam follower (1) and tighten setscrew (2).
- (3) Install cam roller holder (3) and tighten setscrew (4).
- (4) Install spring (5).
- (5) Install looper holder (6) and tighten three set-screws (7).
- (6) Install finger (8) and screw (9).
- (7) Install looper (10) and setscrew (11).

LEGEND:

- | | |
|------------------|--------------|
| 1. Cam Follower | 7. Setscrew |
| 2. Setscrew | 8. Finger |
| 3. Holder | 9. Screw |
| 4. Setscrew | 10. Looper |
| 5. Spring | 11. Setscrew |
| 6. Looper Holder | 12. Shaft |

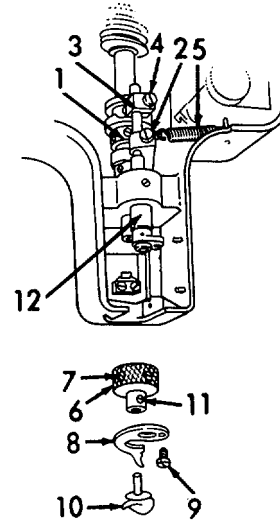


Figure 6-149. Looper and Finger Installation.

- (8) Refer to Figure 6-150. Install guide block (1) and screw (2).
- (9) Install finger guard (3) and two springs (4).
- (10) Install needle plate (5) and four screws (6).

LEGEND:

- | | |
|----------|-----------|
| 1. Block | 4. Spring |
| 2. Screw | 5. Plate |
| 3. Guard | 6. Screw |

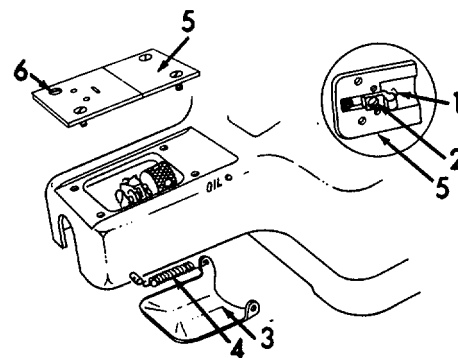


Figure 6-150.

END OF TASK

6-47. STITCH ADJUSTMENT MECHANISM MAINTENANCE.

This task covers:

- | | | |
|------------|-----------------|---------------|
| a. Removal | b. Cleaning | c. Inspection |
| d. Repair | e. Installation | |
-

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Equipment
Condition

Para.

2-9

2-14

Condition Description

Electrical power
removed.

Thread and needle
removed.

Special Environmental Conditions

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

**6-47. STITCH ADJUSTMENT MECHANISM MAINTENANCE -
Continued.**

a. *Removal (Refer to Figures 6-151 through 6-153).*

- (1) Refer to Figure 6-151. Remove two screws (1), two washers (2), and large cam (3).
- (2) Remove left-hand threaded screw (4).
- (3) Remove three screws (6), small cam (7), and plate (8).
- (4) Remove small cam assembly (5).
- (5) Loosen setscrew (9) and remove front cam arm (10).
- (6) Loosen setscrew (11) and remove rear cam arm (12).
- (7) Remove two screws (13) and spring (14).

LEGEND:

- | | |
|-----------------|--------------|
| 1. Screw | 8. Plate |
| 2. Washer | 9. Setscrew |
| 3. Large Cam | 10. Cam Arm |
| 4. Screw | 11. Setscrew |
| 5. Cam Assembly | 12. Cam Arm |
| 6. Screw | 13. Screw |
| 7. Cam | 14. Spring |

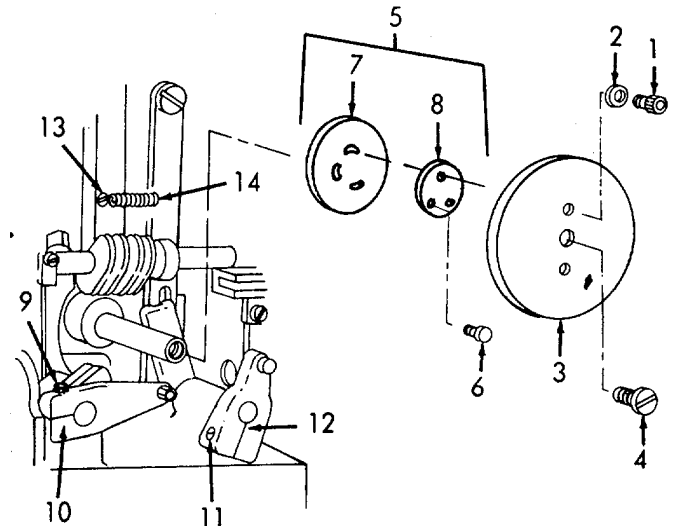


Figure 6-151. Cam and Cam Arms, Removal.

- (8) Refer to Figure 6-152. Remove two screws (1) and spring (2).
- (9) Remove screw (3) and bed (4).

LEGEND:

- | | |
|-----------|----------|
| 1. Screw | 3. Screw |
| 2. Spring | 4. Bed |

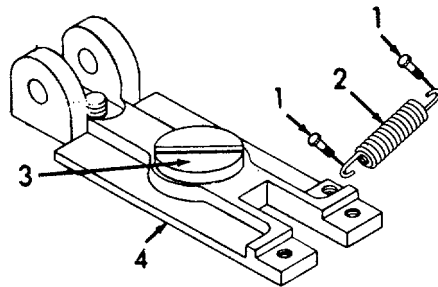


Figure 6-152. Adjustment and Shifter Levers, Removal.

GO TO NEXT PAGE

6-47. STITCH ADJUSTMENT MECHANISM MAINTENANCE - Continued.

a. Removal - Continued.

LEGEND:

- | | |
|------------|-------------------|
| 1. Knob | 10. Knob |
| 2. Washer | 11. Washer |
| 3. Screw | 12. Screw |
| 4. Plate | 13. Plate |
| 5. Washer | 14. Indicator |
| 6. Strap | 15. Washer |
| 7. Pivot | 16. Bearing |
| 8. Bearing | 17. Shifter Lever |
| 9. Stud | 18. Stud |

- (10) Refer to Figure 6-153. Remove knob (1) and washer (2).
- (11) Remove two screws (3) and plate (4).
- (12) Remove washer (5), and adjustment strap (6).
- (13) Remove pivot (7), stud bearing (8), and sliding stud (9).
- (14) Remove knob (10) and washer (11).
- (15) Remove two screws (12) and plate (13).
- (16) Remove indicator (14), washer (15), and stud bearing (16).
- (17) Remove shifter lever (17) and sliding stud (18).

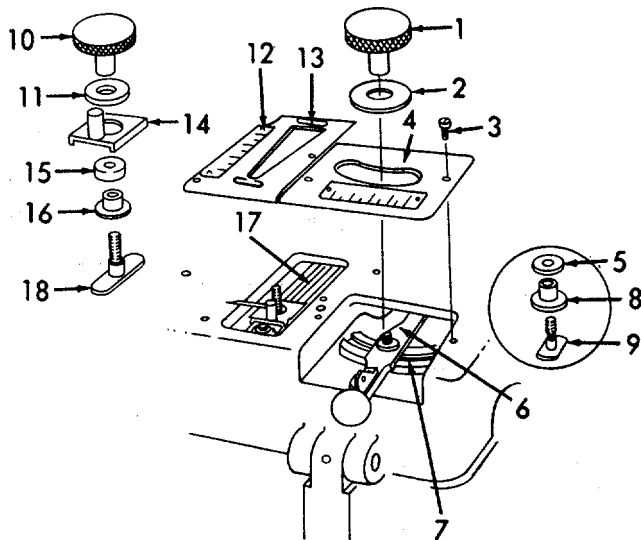


Figure 6-153. Control Knobs and Mechanism, Removal

b. Cleaning.

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

GO TO NEXT PAGE

**6-47. STITCH ADJUSTMENT MECHANISM MAINTENANCE -
Continued.***b. Cleaning - Continued.*

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

c. Inspection.

- (1) Inspect for damaged hardware.
- (2) Inspect for damaged spring.
- (3) Inspect for damaged cams.
- (4) Inspect for damaged gears.
- (5) Inspect for damaged shaft.
- (6) Inspect for damaged cam arms.
- (7) Inspect for damaged plates.
- (8) Inspect for damaged adjustment strap.
- (9) Inspect for damaged shifter lever.
- (10) Inspect for damaged knobs.
- (11) Inspect for damaged pivot.

d. Repair. Repair of the stitch adjustment mechanism is limited to the replacement of defective components.

GO TO NEXT PAGE

6-47. STITCH ADJUSTMENT MECHANISM MAINTENANCE - Continued.

e. *Installation (Refer to Figures 6-154 through 6-156).*

LEGEND:

- | | |
|--------------|-------------|
| 1. Stud | 10. Stud |
| 2. Lever | 11. Bearing |
| 3. Bearing | 12. Pivot |
| 4. Washer | 13. Strap |
| 5. Indicator | 14. Washer |
| 6. Plate | 15. Plate |
| 7. Screw | 16. Screw |
| 8. Washer | 17. Washer |
| 9. Knob | 18. Knob |

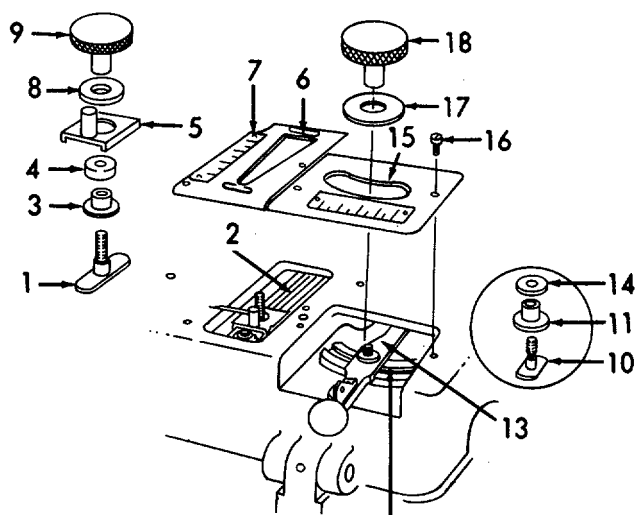


Figure 6-154. Control Knobs and Mechanism, Installation.

LEGEND:

- | | |
|----------|-----------|
| 1. Bed | 3. Spring |
| 2. Screw | 4. Screw |

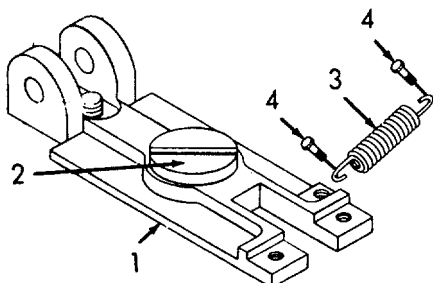


Figure 6-155. Adjustment and Shifter Levers, Installation.

- (1) Refer to Figure 6-154. Install sliding stud (1) and shifter lever (2).
- (2) Install stud bearing (3), washer (4) and indicator (5).
- (3) Install plate (6) and two screws (7).
- (4) Install washer (8) and knob (9).
- (5) Install sliding stud (10), stud bearing (11), and pivot (12).
- (6) Install adjustment strap (13) and washer (14).
- (7) Install plate (15) and two screws (16).
- (8) Install washer (17) and knob (18).

- (9) Refer to Figure 6-155. Install bed (1) and screw (2).
- (10) Install spring (3) and two screws (4).

GO TO NEXT PAGE

6-47., STITCH ADJUSTMENT MECHANISM MAINTENANCE - Continued.

e. Installation - Continued.

- (11) Refer to Figure 6-156. Install spring (1) and two screws (2).
- (12) Install rear cam arm (3) and tighten setscrew (4).
- (13) Install front cam arm (5) and tighten setscrew (6).
- (14) Install small cam (7), plate (8), and three screws (9). Be sure that the timing mark on the cam is alined with the timing mark on the gearshaft.
- (15) Install large cam (11), two washers (12), and two screws (13). Be sure hole in cam (11) alines with the drilled mark in the small cam (7).
- (16) Install left-hand threaded screw (10).
- (17) When aligning large cam (11) and small cam (7), be sure that the two/four button selector knob and the button clamp vibrator regulator (yellow knob) are both set to their maximum values.

LEGEND:

- | | |
|-------------|------------|
| 1. Spring | 8. Plate |
| 2. Screw | 9. Screw |
| 3. Cam Arm | 10. Screw |
| 4. Setscrew | 11. Cam |
| 5. Cam Arm | 12. Washer |
| 6. Setscrew | 13. Screw |
| 7. Cam | |

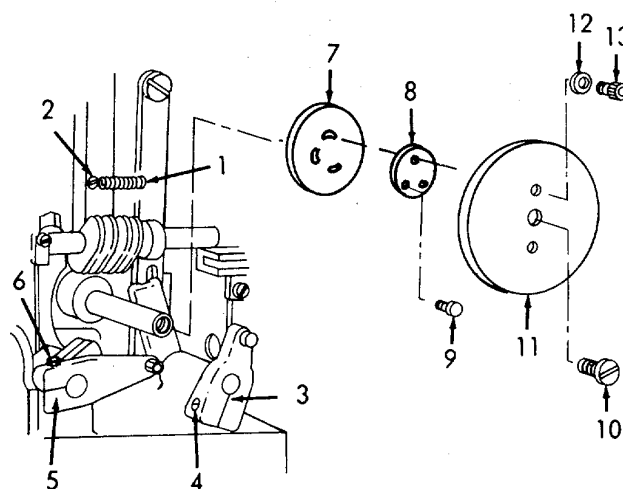


Figure 6-156. Cam and Cam Arms, Installation.

END OF TASK

6-48. STOPPING MECHANISM MAINTENANCE.

This task covers:

- | | | |
|------------|-----------------|---------------|
| a. Removal | b. Cleaning | c. Inspection |
| d. Repair | e. Installation | |
-

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material/Parts

Cleaning Solvent

(Appendix E, item 2)

Cloth, Soft, Lint-Free

(Appendix E, item 3)

Brush, Medium Bristle

(Appendix E, item 1)

Equipment
Condition

Para.

2-9

2-14

Special Environmental Conditions

Condition Description

Electrical power
removed.

Thread and needle
removed.

None

Personnel Required

1 Person

General Safety Instructions

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

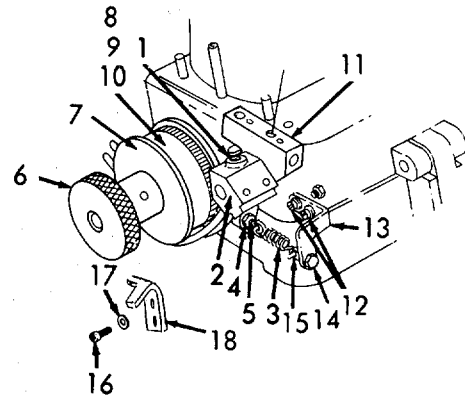
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6-48. STOPPING MECHANISM MAINTENANCE - Continued.

a. *Removal (Refer to Figures 6-157 and 6-158).*

- | | | |
|-----|--|-------------|
| (1) | Refer to Figure 6-157. Loosen setscrew (1) and remove belt finger holder (2). | LEGEND: |
| (2) | Remove spring (3), nut (4), and stud (5). | 1. Setscrew |
| (3) | Loosen the setscrews and remove the knurled knob (6). | 2. Holder |
| (4) | Slide off the outer pulley (7). | 3. Spring |
| (5) | Loosen the setscrew (8), then remove the tapered pin (9), and inner pulley (10). | 4. Nut |
| (6) | Remove cushion spring holder (11). | 5. Stud |
| (7) | Remove two screws (12), bracket (13), nut (14), and stud (15). | 6. Knob |
| (8) | Bracket (18) must be marked in relation to machine case before removal. | 7. Pulley |
| (9) | Remove two screws (16), two washers (17), and bracket (18). | 8. Setscrew |

- | |
|-------------|
| 10. Pulley |
| 11. Holder |
| 12. Screw |
| 13. Bracket |
| 14. Nut |
| 15. Stud |
| 16. Screw |
| 17. Washer |
| 18. Bracket |



GO TO NEXT PAGE

Figure 6-157. Belt Finger Holder and Cushion Spring Removal.

6-48. STOPPING MECHANISM MAINTENANCE - Continued.

a. Removal - Continued.

LEGEND:

- | | |
|-------------|--------------|
| 1. Spring | 11. Setscrew |
| 2. Spring | 12. Setscrew |
| 3. C-Ring | 13. Shaft |
| 4. Pin | 14. Block |
| 5. Holder | 15. Block |
| 6. Screw | 16. Washer |
| 7. Clip | 17. Nut |
| 8. Tripper | 18. Shaft |
| 9. Screw | 19. Nut |
| 10. Bracket | 20. Stud |

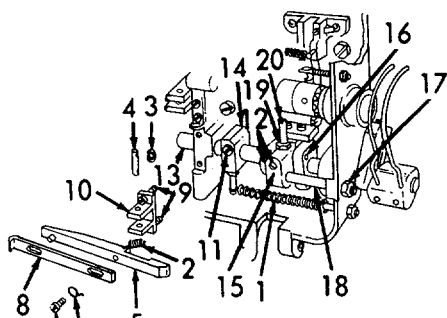


Figure 6-158. Stopping Mechanism, Removal.

b. Disassembly (Refer to Figure 6-159).

LEGEND:

- | | |
|---------------|-----------|
| 1. Screw | 5. Washer |
| 2. Lockwasher | 6. Finger |
| 3. Plate | 7. Spring |
| 4. Nut | 8. Block |

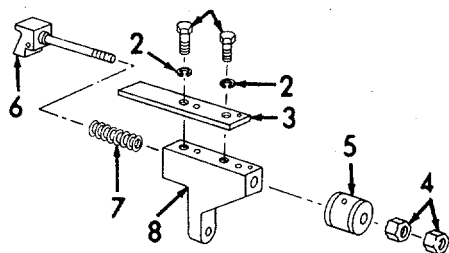


Figure 6-159. Cushion Spring Holder, Disassembly.

- (9) Refer to Figure 6-158. Remove spring (1), and spring (2).
- (10) Remove C-ring (3), pin (4), and stop tripper holder (5).
- (11) Index mark tripper (8) in relation to holder (5) before removing screw (6), clip (7), and motion kick-off tripper (8).
- (12) Remove two screws (9) and bracket (10).
- (13) Loosen setscrews (11) and (12).
- (14) Remove shaft (13).
- (15) Remove stop shaft block (14), stop shaft guide block (15), and felt washer (16).
- (16) Remove nut (17) and shaft (18).
- (17) Remove nut (19) and stud (20).

GO TO NEXT PAGE

6-48. STOPPING MECHANISM MAINTENANCE - Continued.*c. Cleaning.*

- (1) Remove all buildups of grease, dirt, etc. by wiping with a soft, clean cloth.

WARNING

Cleaning solvent, Federal Specification P-D-680, is both toxic and flammable. Keep off skin. Use only in a well-ventilated area and avoid prolonged breathing of vapors. Keep away from open flame.

- (2) Clean using cleaning solvent (Appendix E, item 2) and either a soft, clean cloth (Appendix E, item 3) or a medium bristle brush (Appendix E, item 1).
- (3) Allow to dry.

d. Inspection.

- (1) Inspect for damaged hardware.
- (2) Inspect for damaged springs.
- (3) Inspect for damaged belt finger holder.
- (4) Inspect for damaged cushion spring holder.
- (5) Inspect for damaged brackets.
- (6) Inspect for damaged stop tripper holder.
- (7) Inspect for damaged motion kick-off tripper.
- (8) Inspect for damaged shaft.
- (9) Inspect for damaged stop shaft block.
- (10) Inspect for damaged stop shaft guide block.
- (11) Inspect for damaged felt washer.
- (12) Inspect for damaged rebound finger.

- e. Repair.* Repair of the stopping mechanism is limited to the replacement of defective components.

GO TO NEXT PAGE

6-48. STOPPING MECHANISM MAINTENANCE - Continued.

f. Assembly (Refer to Figure 6-160).

LEGEND:

- | | |
|--------------------|---------------|
| 1. Spring | 5. Plate |
| 2. Finger | 6. Block |
| 3. Washer Assembly | 7. Lockwasher |
| 4. Nut | 8. Screw |

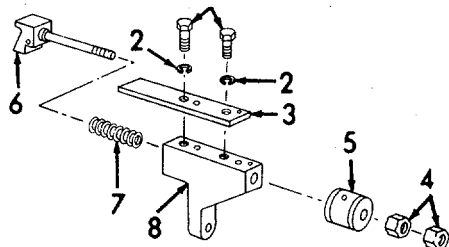


Figure 6-160. Cushion Spring Holder, Assembly

g. Installation (Refer to Figures 6-161 and 6-162).

LEGEND:

- | | |
|--------------|--------------|
| 1. Stud | 11. Bracket |
| 2. Nut | 12. Screw |
| 3. Shaft | 13. Tripper |
| 4. Nut | 14. Clip |
| 5. Washer | 15. Screw |
| 6. Block | 16. Holder |
| 7. Block | 17. Pin |
| 8. Shaft | 18. C-Washer |
| 9. Setscrew | 19. Spring |
| 10. Setscrew | 20. Spring |

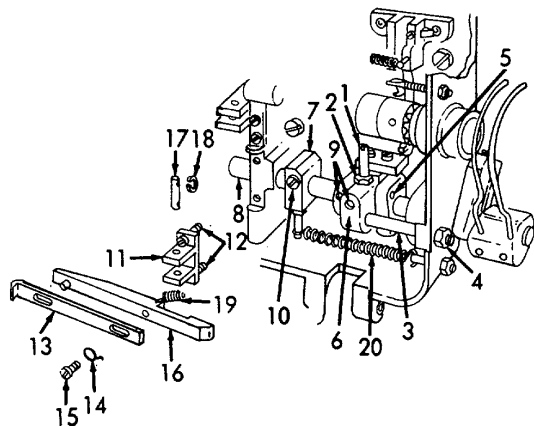


Figure 6-161. Stopping Mechanism, Installation.

- (1) Install spring (1), rebound finger (2), washer assembly (3), and two nuts (4).
- (2) Install plate (5) to block (6) and secure with two lockwashers (7) and two screws (8).

- (1) Refer to Figure 6-161. Install stud (1) and nut (2).
- (2) Install shaft (3) and nut (4).
- (3) Install felt washer (5), stop shaft guide block (6), stop shaft block (7).
- (4) Install shaft (8).
- (5) Tighten setscrews (9) and (10).
- (6) Install bracket (11) and two screws (12).
- (7) Align index marks while installing motion kick-off tripper (13) to holder (16). Install clip (14) and screw (15).
- (8) Install stop tripper holder (16), pin (17), and C-washer (18).
- (9) Install spring (19) and spring (20).

GO TO NEXT PAGE

6-48. STOPPING MECHANISM MAINTENANCE - Continued.

g. Installation - Continued.

- (10) Refer to Figure 6-162. Install bracket (1), two washers (2), and two screws (3).
- (11) Install stud (4), nut (5), bracket (6), and two screws (7).
- (12) Install cushion spring holder (8).
- (13) Install inner pulley (9), tapered pin (10), and set-screw (11).
- (14) Install outer pulley (12).
- (15) Install knurled knob (13) and tighten setscrews.
- (16) Install stud (14), nut (15), and spring (16).
- (17) Install belt finger holder (17) and setscrew (18).

LEGEND:

- | | |
|------------|--------------|
| 1. Bracket | 10. Pin |
| 2. Washer | 11. Setscrew |
| 3. Screw | 12. Pulley |
| 4. Stud | 13. Knob |
| 5. Nut | 14. Stud |
| 6. Bracket | 15. Nut |
| 7. Screw | 16. Spring |
| 8. Holder | 17. Holder |
| 9. Pulley | 18. Setscrew |

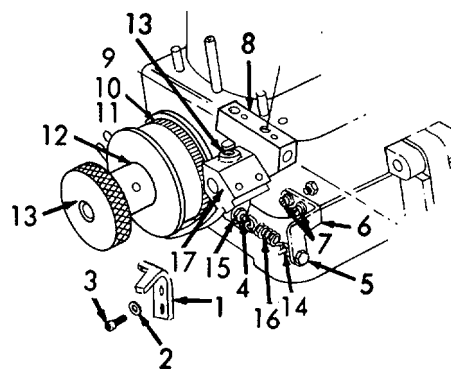


Figure 6-162. Belt Finger Holder Cushion Spring Holder, Installation.

END OF TASK

6-49. MACHINE TIMING.

This task covers:

- a. Timing Loper to Needle Bar
- b. Timing the Finger
- c. Thread Lock Timing Adjustment
- d. Timing of Top Intermittent Tension

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material/Parts

None

Personnel Required

1 Person

Equipment Condition

Para.

2-9

Condition Description

Electrical power removed.

2-14

Thread and needle removed.

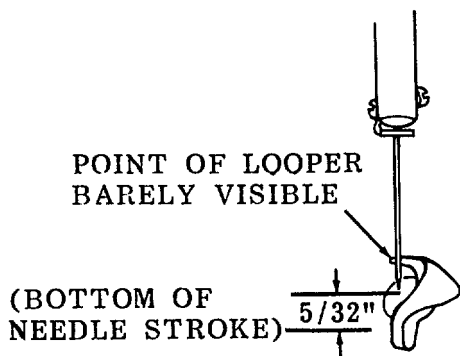
Special Environmental Conditions

None

General Safety Instructions

None

a. *Timing Loper to Needle Bar (Refer to Figures 6-163 through 6-166).*



- (1) Refer to Figure 6-163. Turn the machine pulley by hand to rotate the looper counter-clockwise.
- (2) Continue turning the machine pulley until the needle is raised 5/32 inch from the bottom of its stroke. Check that the point of the looper is barely visible on the left side of the needle.

Figure 6-163. Loper Rotational Adjustment check.

GO TO NEXT PAGE

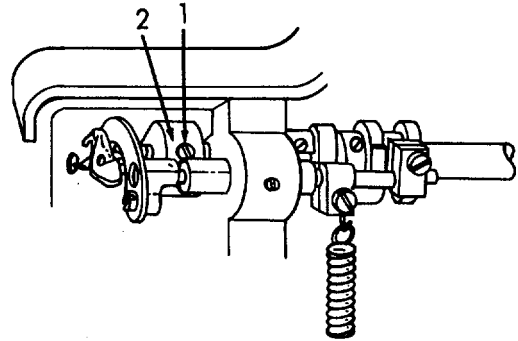
6-49. MACHINE TIMING - Continued.

a. Timing Loper to Needle Bar - Continued.

- (3) To adjust, refer to Figure 6-164. Loosen three set- screws (1) and rotate the knurled knob (2) until this setting is made.
- (4) Tighten the setscrews (1) and recheck per step (2) above.

LEGEND:

- 1. Setscrew
- 2. Knob



- (5) Refer to Figure 6-165. Check that there is barely a space of light between the needle and the looper point.

Figure 6-164. Loper Rotational Adjustment.

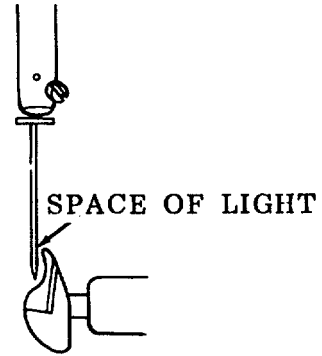


Figure 6-165. Loper Lateral Adjustment Check

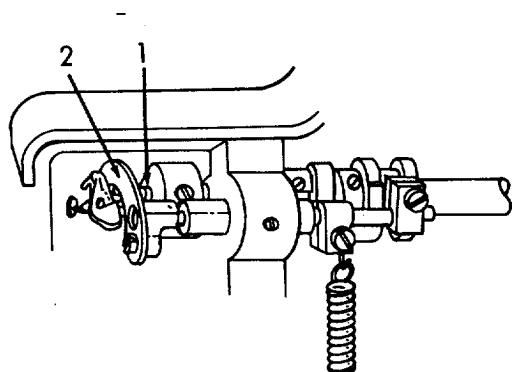
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6-49. MACHINE TIMING - Continued.

a. Timing Looper to Needle Bar - Continued.

LEGEND:

- 1. Setscrew
- 2. Looper



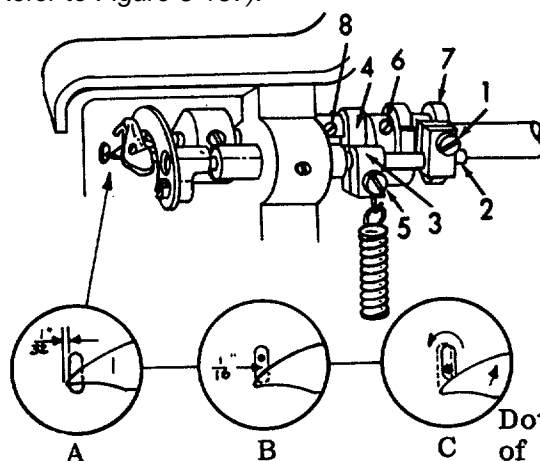
- (6) To adjust, refer to Figure 6-166. Loosen setscrew (1) and move looper (2) in or out the required amount.
- (7) Tighten setscrew (1) and recheck per step (5) above.

Figure 6-166. Looper Lateral Adjustment.

b. Timing the Finger (Refer to Figure 6-167).

LEGEND:

- 1. Setscrew
- 2. Shaft
- 3. Finger
- 4. Eccentric
- 5. Setscrew
- 6. Setscrew
- 7. Cam
- 8. Setscrew



Finger moving forward while Needle descending.

Finger position from time Needle enters Throat Plate hole and returns.

Dotted line shows path of Finger point. Finger starts moving backward and sideways as soon as Needle clears back of Finger.

Figure 6-167. Timing the Finger.

GO TO NEXT PAGE

6-49. MACHINE TIMING - Continued.*b. Timing the Finger - Continued.*

(1) Time the lateral setting first as follows:

- (a) Rotate the machine pulley until the needle has descended fully and the looper finger has reached the most forward position as shown by A. The point of the finger should be extended 1/32 inch beyond the front edge of the slot in the throat plate.
- (b) To adjust, loosen the setscrew (1) and move the shaft (2) in or out the required amount.
- (c) Tighten the setscrew (1) and recheck per step (a) above.
- (d) Be sure that the eccentric finger (3) does not bind against the shoulder of the eccentric (4). If binding occurs, loosen the setscrew (5) and move the eccentric finger (3). Retighten setscrew (5).

(2) Time the radial setting as follows:

- (a) Lower the needle (using the machine pulley) to the bottom of its stroke.
- (b) Check for a 1/16 inch clearance between the needle and the back edge of the finger as shown by B.
- (c) To adjust, loosen setscrew (5) and move the finger into the correct position.
- (d) Retighten the setscrew and recheck per step (b) above.
- (e) Turn the machine pulley counterclockwise and observe the finger movement. At the instant the needle point has cleared the finger, the finger should start moving counterclockwise (backwards and sideways at the same time) as shown by C.
- (f) To adjust the sideways movement, loosen three setscrews (6) and rotate the barrel cam (7) to provide the correct setting. Retighten the setscrews (6) and recheck finger movement.
- (g) To adjust the backwards movement, loosen three setscrews (8) and rotate the finger eccentric (4) to provide the correct setting. Retighten the setscrews (8) and recheck finger movement.

GO TO NEXT PAGE

6-49. MACHINE TIMING - Continued.

b. Timing the Finger - Continued.

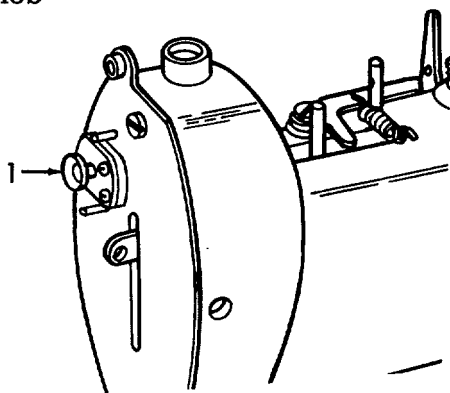
NOTE

After performing all adjustments recheck all settings per paragraphs (1) and (2) above.

c. Thread Lock Timing Adjustment (Refer to Figures 6-168 and 6-169).

LEGEND:

- 1. Knob

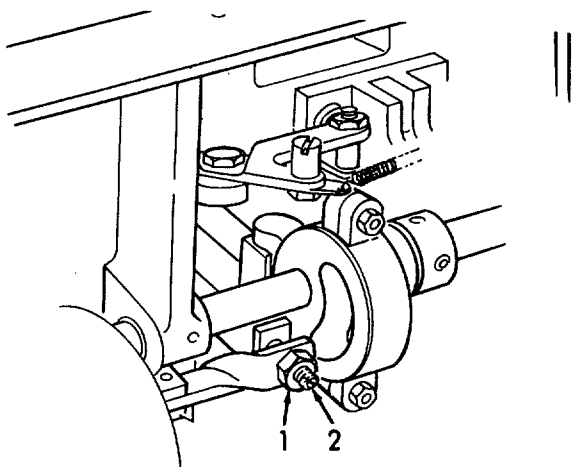


- (1) Refer to Figure 6-168. Rotate the machine pulley counter-clockwise until the needle bar is within 1/8 to 5/32 inch from the top of its final stroke of the sewing cycle. Check that the knurled knob (1) is extended outward.

Figure 6-168. Thread Lock Timing Adjustment Check.

LEGEND:

- 1. Locknut
- 2. Screw



- (2) To adjust, refer to Figure 6-169. Loosen the locknut (1) and turn the adjusting screw (2) clockwise to advance the thread locking or counter-clockwise to retard the thread locking.
- (3) Retighten the locknut and recheck the timing per step (1) above.

Figure 6-169.

GO TO NEXT PAGE

6-49. MACHINE TIMING - Continued.

d. *Timing of Top Intermittent Tension (Refer to Figure 6-170).*

- (1) Rotate the machine pulley counter-clockwise until the needle bar is $\frac{5}{32}$ inch from the top of its stroke. The thread should be locked.
- (2) To adjust, loosen the setscrew (1) turn the adjusting screw (2) clockwise to retard the locking or counter-clockwise to advance the timing.
- (3) Tighten the setscrew (1) and recheck per step (1) above.

LEGEND:

1. Setscrew
2. Adjusting Screw

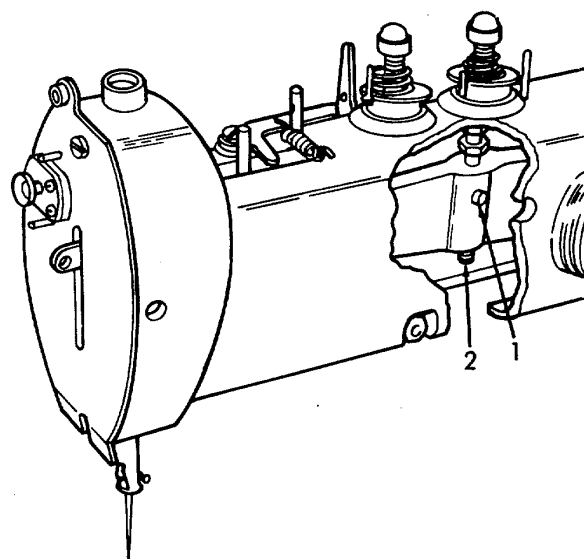


Figure 6-170. Top Intermittent Tension Timing.

END OF TASK

6-50. ELECTRIC MOTOR MAINTENANCE.

For maintenance of the electric motor, refer to paragraph 6-27.

6-51. STORAGE BOX ASSEMBLY MAINTENANCE.

This task covers:

- | | | |
|------------------------------|------------|-----------------|
| a. Installed Item Inspection | b. Removal | c. Cleaning |
| d. Inspection | e. Repair | f. Installation |
-

INITIAL SETUP

Applicable Configurations
All 2-9

Equipment
Condition
Para. Condition Description
Storage box removed.

Test Equipment
None

Special Environmental Conditions
None

Special Tools
None

General Safety Instructions
None

Material/Parts
Rivets

Personnel Required
1 Person

a. Installed Item Inspection.

- (1) Inspect for loose or missing handle.
- (2) Inspect for rust, corrosion, and visible damage.
- (3) Inspect for loose or damaged hinge.
- (4) Inspect for loose or missing hardware.

b. Removal. Refer to paragraph 2-9.

c. Cleaning.

- (1) Clean the storage box assembly with a solution of mild soap and water.
- (2) Rinse thoroughly with clean water.
- (3) Allow to dry.

d. Inspection.

- (1) Inspect for loose, missing, or damaged handle.
- (2) Inspect for rust, corrosion, and visible damage.
- (3) Inspect for loose or damaged hinge.
- (4) Inspect for loose, missing, or damaged hardware.

GO TO NEXT PAGE

6-51. STORAGE BOX-ASSEMBLY MAINTENANCE - Continued.

e. *Repair.* Repair of the storage box is limited to the following:

- (1) Replacement of a defective handle as follows:
 - (a) Refer to Figure 6- 171. Remove the four rivets (1) and the handle (2).
 - (b) Place a new handle (2) into position.
 - (c) Install four new rivets (1).

LEGEND:

- 1. Rivet
- 2. Handle

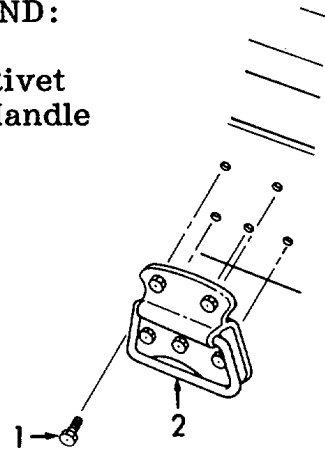


Figure 6-171. Handle, Replacement.

(2) Replacement of a defective latch as follows:

- (a) Refer to Figure 6172. Remove two rivets (1) that secure the latch (2) to the lid.
- (b) Remove four rivets (3) that secure the latch to the bottom.
- (c) Install a new latch (4) into position and secure with four new rivets (3).
- (d) Install a new latch (2) to lid and secure with two new rivets (1) .

LEGEND:

- 1. Rivet
- 2. Latch
- 3. Rivet
- 4. Latch

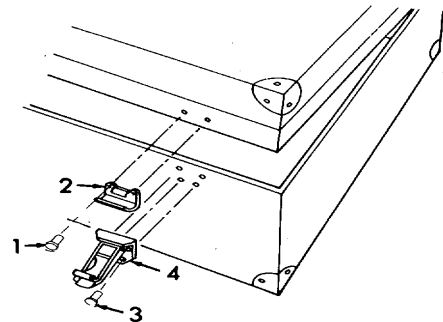


Figure 6-172. Latch Replacement.

f. *Installation.* Refer to paragraph 2-9.

END OF TASK

CHAPTER 7

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I.	REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT
Section II.	MAINTENANCE OF CABINET ASSEMBLY

SECTION I. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

	Para.		Para.
Common Tools and Equipment	7-1	Special Tools, TMDE, and	
Repair Parts.....	7-3	Support Equipment	7-2

7-1. COMMON TOOLS AND EQUIPMENT.

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

7-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

No special tools, TMDE, or support equipment is authorized for the maintenance of the clothing repair shop.

7-3. REPAIRPARTS.

Repair parts are listed and illustrated in the repair parts and special tools list TM 10-3530-205-24P, covering organizational, direct support and general support, and depot maintenance for this equipment.

SECTION II. MAINTENANCE OF CABINET ASSEMBLY

	Para.		Para.
Cabinet Assembly Maintenance	7-5	General.....	7-4

7-4. GENERAL.

This section contains information on the repair of the cabinet assembly.

7-5. CABINET ASSEMBLY MAINTENANCE.

This task covers: a. Repair of Holes and Dents	b. Repair of Framework d. Repair of Holddown Clamps
---	--

INITIAL SETUP

Applicable Configuration
All

Test Equipment
None

Special Tools
Riveting Tool Set
Welding Set (for Aluminum)
Paint Spraying Equipment

Material/Parts
Rivets
Aluminum Sheet Metal (Patches)
Primer, Zinc Chromate
(Appendix E, item 7)
Paint, Olive Drab
(Appendix E, item 6)
Sealing Compound
(Appendix E, item 8)

Equipment
Condition
Para. Condition Description
2-9 All equipment removed
 from cabinet.

Special Environmental Conditions
None

General Safety Instructions
None

Personnel Required
2 Persons

a. *Repair of Holes and Dents.*

(1) Dents.

- (a) Push out all dents. (If damage is too great to push out, treat as if it were a hole. Refer to para. 7-5 a. (2) below).
- (b) Sand area with sandpaper and refinish with primer (Appendix E, item 7) and olive drab paint (Appendix E, item 6).

(2) Holes.

- (a) Cut away the affected areas to remove all jagged edges. If metal is bent, straighten.
- (b) Sand both sides of the area with sandpaper to remove all sharp edges.
- (c) Apply one coat of primer (Appendix E, item 7) to both sides of the sheet metal.

GO TO NEXT PAGE

7-5. CABINET ASSEMBLY MAINTENANCE - Continued.*a. Repair of Holes and Dents - Continued.*

(2) Holes - Continued.

- (d) Cut two patches that are alike. Be sure that they extend at least 1 inch (2.54 cm) over the edges of the hole all the way around.
- (e) Place the patches in position and drill holes not further than 1-1/2 inches (3.18 cm) apart for mounting the rivets.
- (f) Apply one coat of primer (Appendix E, item 7) to both sides of the patches and allow to dry.
- (g) Apply sealing compound (Appendix E, item 8) between both patches and the sheet metal.
- (h) Install the patches with rivets.
- (i) Refinish both the inside and outside of the primered and patched area with olive drab paint (Appendix E, item 6).

b. Repair of Framework.

- (1) Remove all paint from at least 4 inches (10 cm) on each side of the damaged area.
- (2) Cut away the damaged area if bent or twisted. Cut away several inches away from a break. If the frame is cracked, the area does not have to be cut away.
- (3) Cut a new piece of material of the same size and shape as the frame piece to be repaired.
- (4) Place the new piece into position and weld into place. If frame was cracked, weld the crack using aluminum techniques.
- (5) Refinish the repaired area with primer (Appendix E, item 7) and olive drab paint (Appendix E, item 6).

c. Repair of Holddown Clamps. Repair of the holddown clamps is limited to the welding of broken or cracked parts using stainless steel welding techniques.

END OF TASK

APPENDIX A

REFERENCES

A-1. SCOPE.

This appendix lists all forms, field manuals, technical manuals, and miscellaneous publications referenced in this manual.

A-2. FORMS.

Equipment Improvement Recommendations..... SF 368

Equipment Inspection and Maintenance Work
Sheet..... DA Form 2404

Recommended Changes to Equipment Technical
Manuals..... DA Form 2028-2

Recommended Changes to Publications and
Blank Forms DA Form 2028

Maintenance Request..... DA Form 2407

Packaging Improvement Report..... DD Form 6

A-3. FIELD MANUALS.

First Aid for Soldiers FM 21-11

A-4. TECHNICAL MANUALS.

Administrative Storage or Equipment..... TM 740-90-1

Lubrication Order LO 10-3530-205-12-1
LO 10-3530-205-12-2
LO 10-3530-205-12-3
LO 10-3530-205-12-4

Operation and Maintenance of Ordnance
Equipment in Cold Weather (0° to -65°F,
-18° to -54°F)..... TM 9-207

Operator, Organizational, Direct Support and
General Support Maintenance Manual for Gener-
ator Set, Gasoline Engine, Military Design
(Less Engine), 3 KW, AC, 60 Hz, DoD Model MEP-
016A, NSN 6115-00-017-8237 TM 5-6115-271-14

Organizational, Direct and General Support
Repair Parts and Special Tools List for
Generator Set, Gasoline Engine, Military
Design (Less Engine), 3 KW, AC, 60 Hz,
DoD Model , MEP-016A, NSN 6105-00-017-8237 TM 5-6115-271-24P

A-4. TECHNICAL MANUALS - Continued.

Operator, Organizational, Direct Support and
General Support Maintenance Manual for Trailer,
Cargo, 1 1/2 Ton, 2-Wheel, M105A2, NSN 2330-
00-141-8050..... TM 9-2330-213-14

Procedures for Destruction of Equipment to
Prevent Enemy Use TM 750-244-3

The Army Maintenance Management System DA PAM 738-750

Organizational, Direct Support and General
Support Repair Parts and Special Tools List
(Including Depot Maintenance Repair Part
and Special Tools) TM 10-3530-205-24P

Tent, General Purpose (Small, Medium, and
Large) TM 10-8340-211-13

A-5. TECHNICAL BULLETINS.

Index of Technical Publications..... DA PAM 310-1

Preservation and Storage of Mechanical Equipment
for Shipment and Storage TB 740-97-2

APPENDIX B

MAINTENANCE ALLOCATION CHART

SECTION I. INTRODUCTION

B-1. GENERAL.

- a. This section provides a general explanation of all maintenance and repair functions authorized at the various maintenance categories.
- b. The Maintenance Allocation Chart (MAC) in section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance categories.
- c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from section II.
- d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS.

Maintenance functions will be limited to and defined as follows:

- a. *Inspect.* To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).
- b. *Test.* To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.
- c. *Service.* Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.
- d. *Adjust.* To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.
- e. *Align.* To adjust specified variable elements of an item to bring about optimum performance.

B-2. MAINTENANCE FUNCTIONS - Continued.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the 3rd position code of the SMR code.

i. Repair. The application of maintenance services¹, including fault location/troubleshooting², removal/installation, and disassembly/assembly³ procedures, and maintenance actions⁴ to identify troubles, and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly) end item, or system.

l. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

¹Services - inspect, test, service, adjust, aline, calibrate, and/or replace

²Fault locate/troubleshoot - The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or unit under test (UUT).

³Disassemble/assemble - encompasses the step-by-step taking apart (or breakdown) of a spare/functional group coded item to the level of its least componency identified as maintenance significant (i.e., assigned an SMR code) for tie category of maintenance under consideration.

⁴Actions - welding, grinding, riveting, straightening, facing, remachinery, and/or resurfacing.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

a. *Column 1, Group Number.* Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group numbers shall be "00".

b. *Column 2, Component/Assembly.* Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. *Column 3, Maintenance Function.* Column 3 lists the functions to be performed on the item listed in Column 2. (For a detailed explanation of these functions, see paragraph B-2).

d. *Column 4, Maintenance Category.* Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the category of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of tasks within a listed maintenance function vary at different maintenance categories, appropriate work time figures will be shown for each category. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time, troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance categories are as follows:

- C.....Operator or crew
- O.....Organizational maintenance
- F.....Direct support maintenance
- H.....General support maintenance
- L.....Specialized Repair Activity (SRA)⁵
- D.....Depot Maintenance

⁵This maintenance category is not included in Section II, column (4) of the Maintenance Allocation Chart. To identify functions to this category of maintenance, enter a work time figure in the "H" column of Section II, column (4), and use an associated reference code in the Remarks column (6). Key the code to Section IV, Remarks, and explain the SRA complete repair application there. The explanatory remark(s) shall reference the specific Repair Parts and Special Tools List (RPSTL) TM which contains additional SRA criteria and the authorized spare/repair parts.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II - Continued.

- e. *Column 5, Tools and Equipment.* Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.
- f. *Column 6, Remarks.* This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION II.

- a. *Column 1, Reference Code.* The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.
- b. *Column 2, Maintenance Category.* The lowest category of maintenance authorized to use the tool or test equipment.
- c. *Column 3, Nomenclature.* Name or identification of the tool or test equipment.
- d. *Column 4, National Stock Number.* The National stock number of the tool or test equipment.
- e. *Column 5, Tool Number.* The manufacturer's part number.

B-5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.

- a. *Column 1, Reference Code.* The code recorded in column 6, Section II.
- b. *Column 2, Remarks.* This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

SECTION II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/ assembly	(3) Maintenance function	(4) Maintenance level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
00	Clothing Repair Shop Trailer Mounted								
01	Cabinet Assembly	Inspect Replace	1.0		3.0			A,C A,D,E,G	A
	Lifting Eye Assembly	Repair Inspect Replace	0.5	1.5	1.5			A A	
	Weldment Assembly	Repair Inspect				1.0			
	Panel Assembly	Repair Inspect	0.5			6.0		A, E, G	B
	Door Assemblies	Repair Inspect	0.5			6.0		A, D, E, G	A
	Hasp and Hinge Assemblies	Inspect Replace	0.5		2.0			A	
	Storage Box Assemblies	Repair Inspect	0.5			2.0		A A	
02	Grommet Press	Replace Inspect	0.5		3.0			A A, D, E, G	A
	Tack Button Attaching Machine	Repair Inspect Replace	0.5	1.0				A	
	Cable Assembly, Electrical	Repair Inspect	0.5	0.5	1.0			A	
		Test Replace		1.0	2.0			A, B A	
		Repair		3.0				A, B	
03	Table Top Assembly Darning Machine	Inspect Replace	0.5					A	
		Repair		2.0				A	
04	Table Top Assembly Button Sewing Machine	Inspect Replace	0.5					A	
		Repair		2.0				A	

Change 1

B-5

(1) Group Number	(2) Component/ assembly	(3) Maintenance function	(4) Maintenance level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
05	Table Top Assembly Clothing Sewing Machine	Inspect	0.5						
		Replace	0.5					A	
06	Table Assembly Folding	Repair		2.0				A	
		Inspect	0.5					A	
		Replace	0.5					A	
07	Tray Assemblies Machine Head	Repair		2.0				A	
		Inspect	0.5					A	
		Replace		0.5				A	
08	Lockstitch Sewing Machine Head	Repair			1.5			A	
		Service	0.5					A	
		Adjust			1.0			A	
		Inspect	0.5					A	
		Replace			0.5			A	
09	Darning Sewing Machine Head	Repair			6.0			A	
		Service	0.5					A	
		Adjust			1.0			A	
		Inspect	0.5					A	
		Replace			0.5			A	
10	Button Sewing Machine Head	Repair			6.0			A	
		Service	0.5					A	
		Adjust			1.0			A	
		Inspect	0.5					A	
		Replace			0.5			A	
11	Stand Assembly, Sewing Machine	Repair			6.0			A	
		Inspect	0.5					A	
		Replace			0.5			A	
12	Hold Down Assembly, Chair & Stand	Repair				2.0		A, E	B
		Inspect	0.5					A	
		Replace		0.5				A	
13	Track Assembly, Generator	Repair			2.0			A	
		Inspect	0.5					A	
		Replace			3.0			A, F	C
14	Fire Extinguisher	Repair			2.0				
		Inspect	0.5						
		Service			0.5				
		Replace	0.5						
		Repair			1.0			A	
15	Clamp Assembly, Hold Down	Inspect	0.5						
		Replace		0.5				A	

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS

Ref. No.	Maint. Cat.	Nomenclature	NSN	Tool No.
A		Tool Kit, General Mechanics		
B		Multimeter		
C		Hoist		
D		Riveting Tool Set		
E		Welding Set (Aluminum)		
F		Welding Set (Steel)		
G		Paint Spray, Equipment		

SECTION IV. REMARKS

Reference code	Remarks
A	Patch, Aluminum weld, and Rivet
B	Aluminum weld and Straighten.
C	Weld and Straighten.

APPENDIX C**COMPONENTS OF END ITEM
AND BASIC ISSUE ITEMS LIST**

SECTION I. INTRODUCTION**C-1. SCOPE.**

This appendix lists components of end item and basic issue items for the clothing repair shop to help you inventory items required for safe and efficient operation.

C-2. GENERAL.

The Components of End Item and Basic Issue Item Lists are divided into the following sections:

a. Section II. Components of End Item. This listing is for information purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the clothing repair shop in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, the basic issue items (BII) must be with the clothing repair shop during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

C- 3. EXPLANATION OF COLUMNS.

a. Column (1) - Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

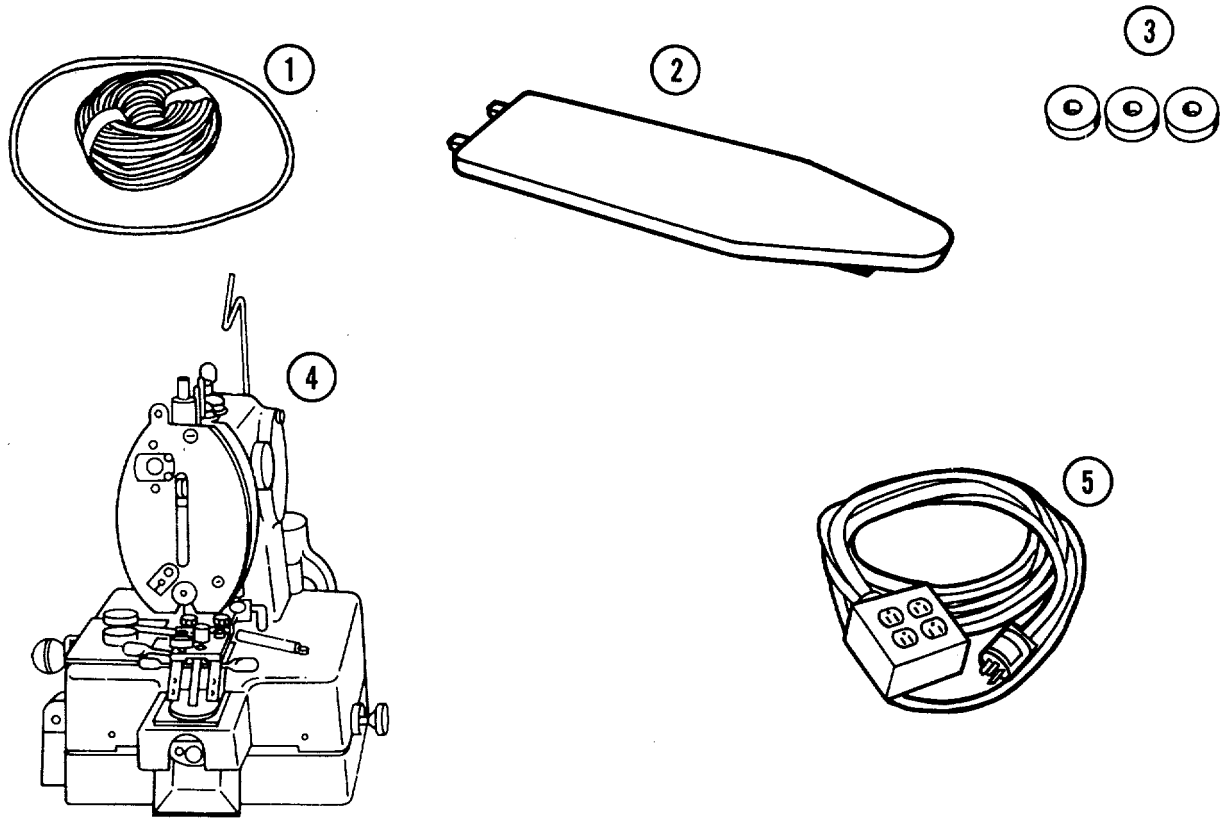
b. Column (2) - National Stock Number. Indicates the National stock

c. Column (3) - Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

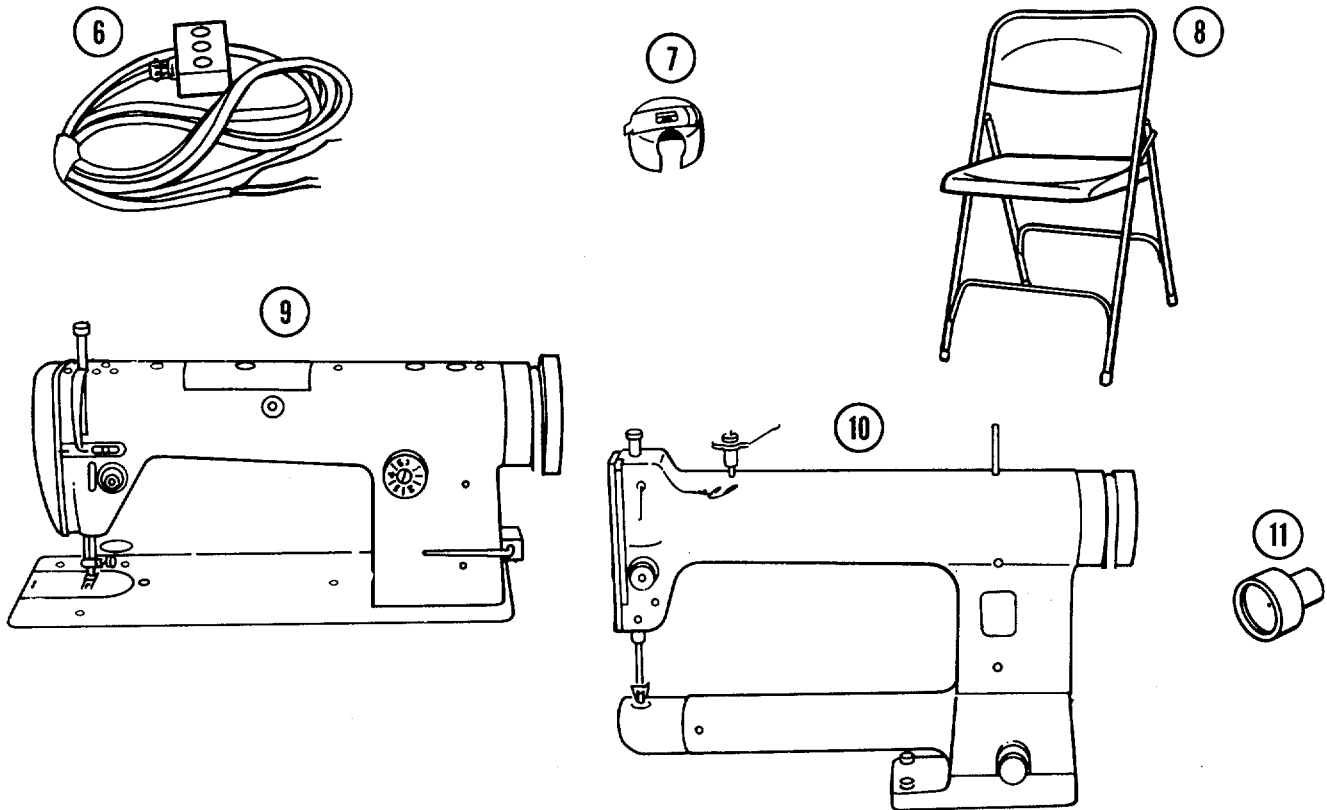
d. Column (4) - Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

e. Column (5) - Quantity required (Qty rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

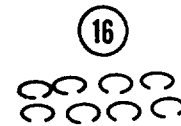
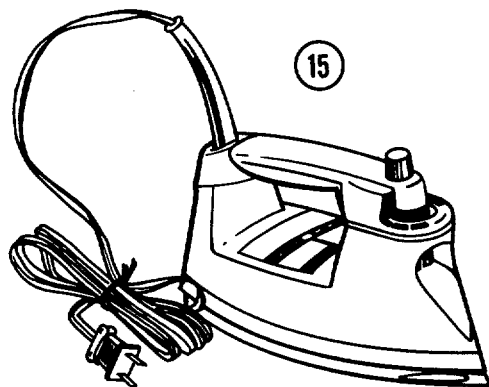
SECTION II. COMPONENTS OF END ITEM



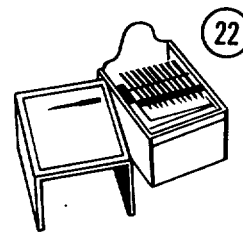
(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USABLE ON CODE	(4) UM	(5) QTY RQR
1	3030-00-359-5707	Belting, Round, Leather Sewing Machine KRB211, TYPE I		FT	85
2		Board, Sleeve w/Cover Set 43-100-01 (*)		EA	1
3	3530-00-390-4540	Bobbin, Hook 40264 (77948)		EA	18
4		Button Sewing Machine, Mdl 600		EA	1
5	3530-00-906-8063	Cable, Power, w/2 Duplex Out- lets, 3-Conductor, No. 12 AWG, 25 ft lg 6-1-1111-27-9 (81337)		EA	3



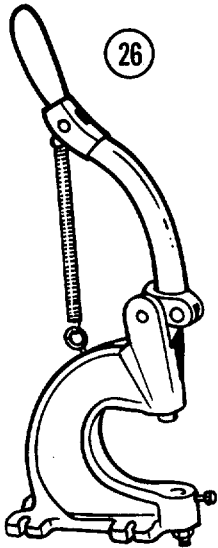
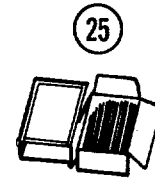
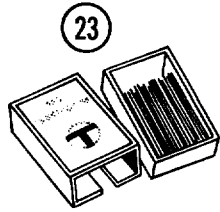
(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE UM	(5) QTY RQR
6	3530-00-906-8064	Cable, Power, Triple Twist Outlet, 4 Conductor, 10 AWG, 25 ft long 6-1-1111-27-1 (81337)	EA.	1
7	3530-00-043-2373 3530-00-999-4598	Case, Bobbin, Sewing Machine 52237 (77948)	EA	7
8	7105-00-269-8463	Chair, Folding AAC291, TYPE I, STYLE A, CLASS I (81337)	EA	6
9		Clothing Machine, Mdl C765	EA	6
10		Darning Sewing Machine, Mdl 678HD	EA	1
11	5110-00-509-8062	Die, Button, Fastener 1483 (61864)	EA	1



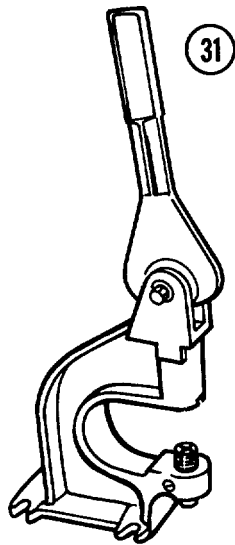
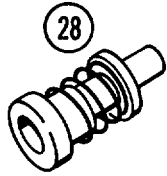
(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE	(5) QTY RQR
12	5120-00-359-6503	Die, Button, Fastener 9182 (61864)	EA.	1
13	5120-00-449-3744	Die, Eyelet, Fastener Tool (for attaching part number 12404) 1488 (61864)	EA	1
14	4210-00-270-4512	Extinguisher, Fire, Carbon Dioxide: Hand Type; Charged 5 lb cap 0-E-910, TYPE I, SIZE 5 (81348)	EA	1
15	7290-00-634-2010	Flat Iron, Electric A-A-632 (58536)	EA	1
16	3530-01-015-2793	Hook, Belt 25127 (77948)	EA	25



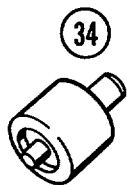
(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE	(5) QTY RQR
17	3530-01-071-5396	Hook, Bobbin	EA.	1
18		Hook, Bobbin SW19689P (98255)	EA	6
19		Looper SW19688P (98255)	EA	1
20	3530-00-245-8026, and/or 3530-01-018-6387	Needle, Sewing Machine, Button, 175x3, Size 18 (100 per pkg)	EA	40
21	3530-00-245-7997	Needle, Sewing Machine, Button, 175x3, Size 20 (100 per pkg)	EA	40
22	3530-00-079-9914	Needle, Sewing Machine, Clothing 16x257, Size 16 (100 per pkg)	EA	60



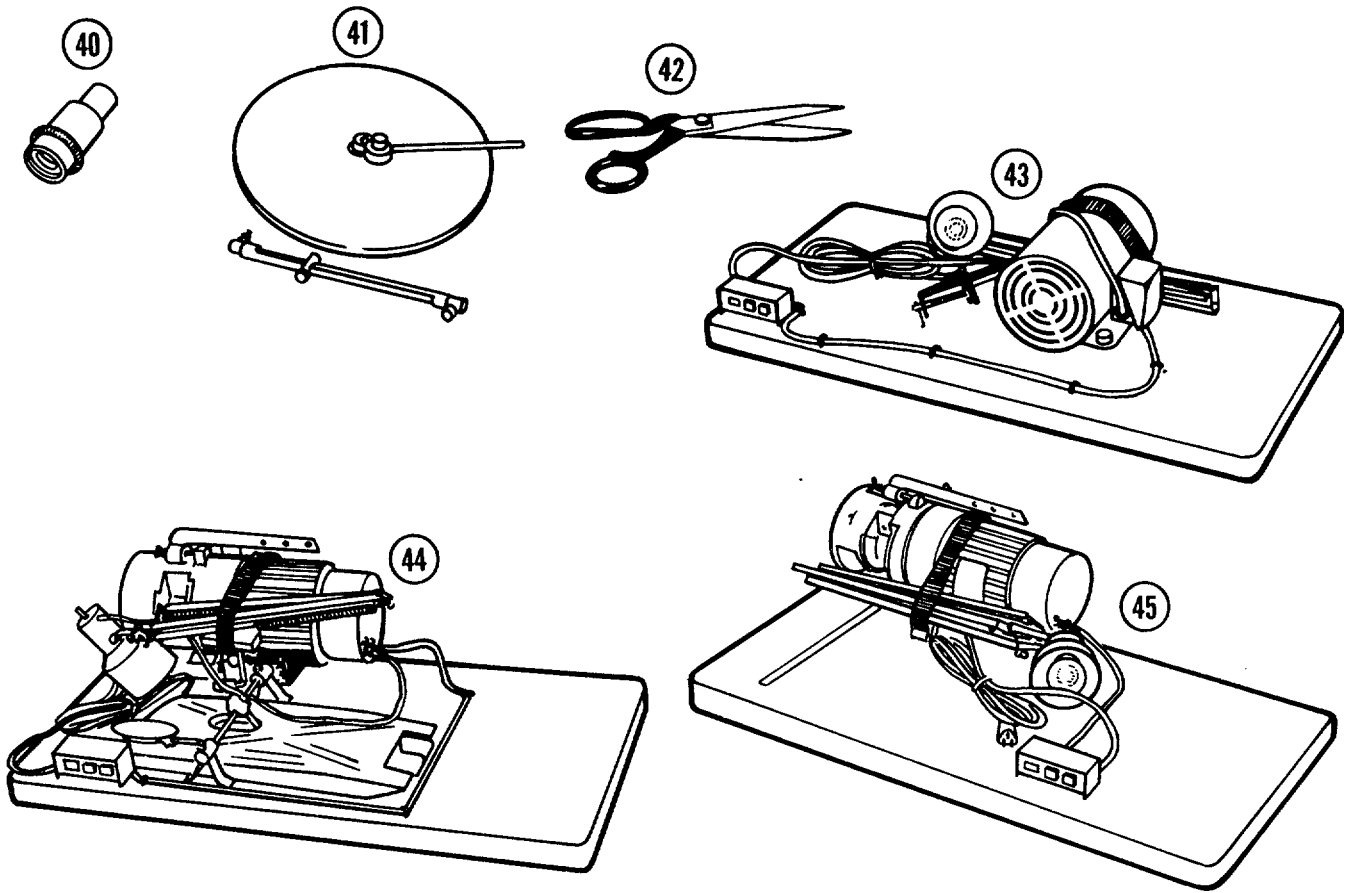
(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE UM	(5) QTY RQR
23	3530-00-079-9915	Needle, Sewing Machine, Clothing 16x257, Size 18	EA.	500
24	3530-00-245-7957,	Needle, Sewing Machine, Darning, 135x1, Size 18 (100 per pkg)	EA	40
25	3530-01-018-6386	Needle, Sewing Machine, Darning, 135x1, Size 20 (100 per pkg)	EA	50
26	5120-00-293-0269	Press, Grommet and Eyelet Attaching Machine, (AE) w/Following 4 items 24578D177 (03961)	EA	1
27	5120-00-322-6190	Die Attaching Machine (Upper Die 3032 Closed) 27C (53705)	EA	1



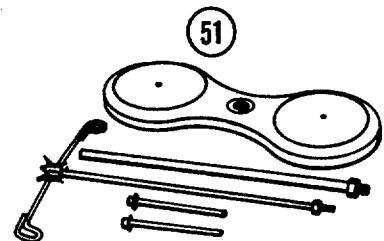
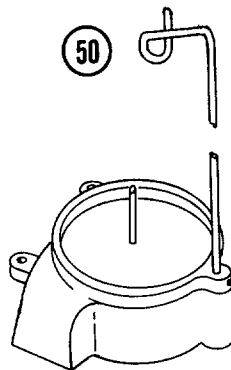
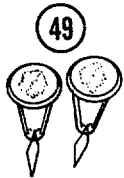
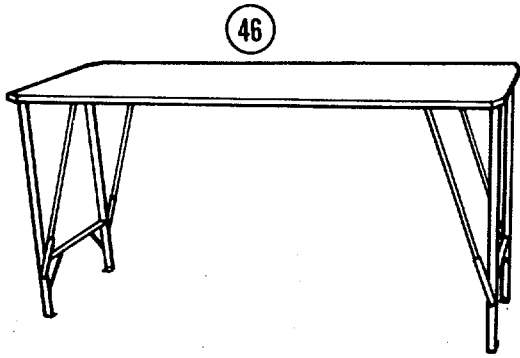
(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE	(5) QTY RQR
28	5120-00-322-6189	Die, Attaching Machine (Lower Die 312) 17 (53705)	EA.	1
29	5120-00-322-6188	Die, Attaching Machine (Lower Die 351) 14 (53705)	EA	1
30	5120-00-900-8324	Die, Upper Open (Upper Die 2727 Open) 27 Open (53705)	EA	1
31	5120-00-880-0619	Press, Grommet, and Eyelet, Hand Operated, 1-1/2" depth of throat, 6-1/2" x 1-1/2" base, w/Chucks & Dies as Follows:	EA	1
32	5120-00-449-3745	Button Die Washer Fastener 9454 (61864)	EA	1



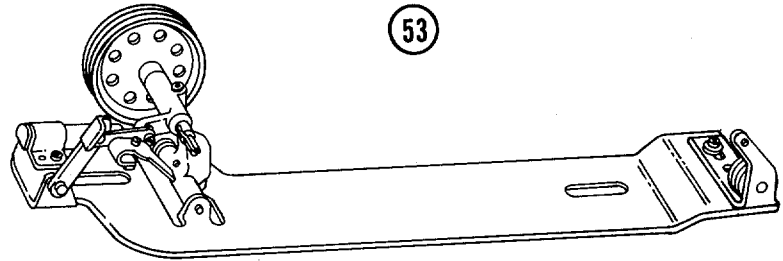
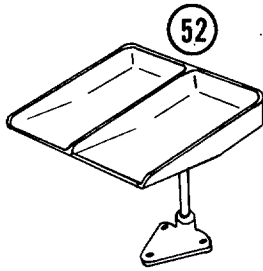
(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE UM	(5) QTY RQR
33	5120-00-357-5594	Chuck 9470 (61864)	EA.	1
34	5120-00-357-5752	Clinch Plate Die 9471 (61864)	EA	1
35	5120-00-144-2100	Eyelet Die 1587 (61864)	EA	1
36	5110-00-090-4401	Punch 9323 (61864)	EA	1
37	5120-00-329-3297	Punch, Stud Fastener 1486 (61864)	EA	1
38	5120-00-144-2087	Socket Chuck 1580 (61864)	EA	1
39	5120-00-357-5596	Stud Chuck 9219 (61864)	EA	1



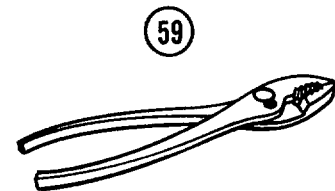
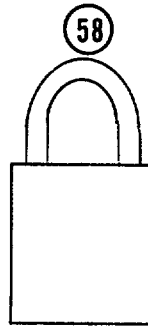
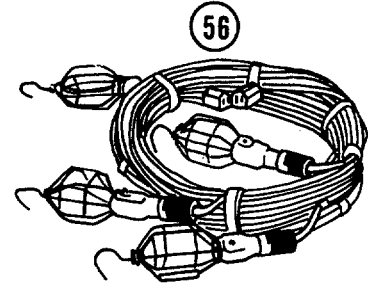
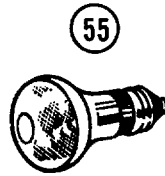
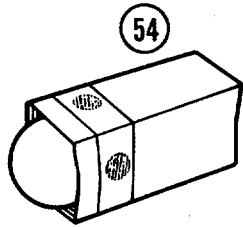
(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE UM	(5) QTY RQR
40	5120-00-357-5597	Stud Chuck 9447 (61864)	EA.	1
41		Pulley Assembly, Belt, Manual Drive 6-1-6461 (81337)	EA	7
42	5110-00-596-9703	Shears, Bent Trimmer CGG-S-00278 TYPE I, STYLE A, CLASS 2 (81348)	EA	4
43		Table Top Assembly Button Sewing Machine	EA	1
44		Table Top Assembly Clothing Machine	EA	6
45	3530-01-212-1224	Table Top Assembly Darning Sewing Machine	EA	1



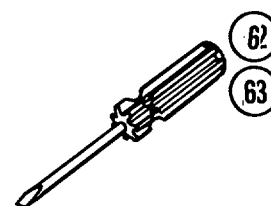
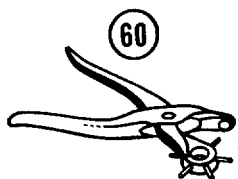
(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE	(5) QTY RQR
46	7195-00-474=5859	Table, Folding Legs 6-1-1117 (81337)	EA	2
47	8315-00-264-2589	Thimble, Sewing, Closed, Large Size	EA	4
48	8315-00-264-2590	Thimble, Sewing, Closed Medium Size	EA	4
49	3530-00-999-4602 and 3530-00-999-4540	Threader, Needle	EA	6
50		Thread Stand 2-543-08-03	EA	1
51	3530-00-616-1612	Thread Unwinder 505656 (77948)	EA	7



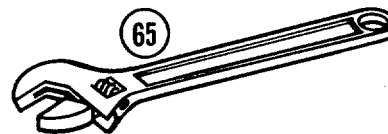
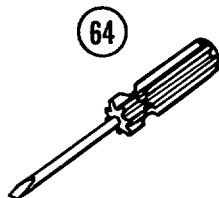
(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE UM	(5) QTY RQR
52	3530-00-824-1897	Tray Assembly, Button 2-552-08-01 (11598)	EA.	1
53		Winder, Bobbin	EA	7



(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE UM	(5) QTY RQR
54	6240-01-090-7262	L amp, Incandescent, 63V, 17W 17R20 (08807)	EA.	4
55	6240-00-246-5052	Lamp, Incandescent, 100W WL101-77T (81348)	EA	8
56	6230-00-901-9755	Light Extension W-L-661, TYPE I, CLASS I 50 ft (81348)	EA	4
57	4930-00-407-7195	Oiler, Hand, 4" Spout 1/2 pt GGG0591 (81348)	EA	4
58	MS21313-162	Padlock Set	EA	1
59	5120-00-223-7397	Pliers, Slip Joint 8" lg GGG-P-471 TYPE 2, STYLE A, CLASS 2 (81348)	EA	1



(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE UM	(5) QTY RQR
60	5110-00-596-9604	Punch, Cutting, Revolving Head MIL-P-2001 (81349)	EA	1
61	5120-00-222-8852	Screwdriver, Flat Tip, 1/4" Tip x 4" blade GGG-S-121, TYPE I, CLASS 5, DESIGN A, (81348)	EA	1
62	5120-00-278-1269	Screwdriver, Flat Tip, 9/64" tip x 1-1/2" blade GGG-S-121, TYPE I, CLASS I, DESIGN A, (81348)	EA	1
63	5120-00-236-2127	Screwdriver, Flat Tip, 3/16" tip x 3" blade GGG-S-121, TYPE I, CLASS I, DESIGN A, (81348)	EA	1



(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE UM	(5) QTY RQR
64	5120-00-787-2504	Screwdriver, Flat Tip, 9/16" tip x 3" blade GGG-S-121, TYPE I, CLASS I, DESIGN A, (81348)	EA	1
65	5120-00-449-8083	Wrench, Adjustable, Crescent Type, Single Open End, 10" lg, 1.135 in. Jaw Opening GGG-W-631, TYPE I, CLASS I, (81348)	EA	1

SECTION III. BASIC ISSUE ITEMS LIST

NOT APPLICABLE

APPENDIX D
ADDITIONAL AUTHORIZATION LIST

NOT APPLICABLE

APPENDIX E

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

SECTION I. INTRODUCTION

E-1. SCOPE.

This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

E-2. EXPLANATION OF COLUMNS.

a. *Column 1 - Item Number.* This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use sealing compound, item 6, Appendix E").

b. *Column 2 - Category.* This column identifies the lowest category of maintenance that requires the listed item.

C - Operator/Crew

O - Organizational Maintenance

F - Direct Support Maintenance

G - General Support Maintenance

c. *Column 3 - National Stock Number.* This is the national stock number assigned to the item; use it to request or requisition the item.

d. *Column 4 - Description.* Indicates the federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. *Column 5 - Unit of Measure (U/M).* Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea., in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

ITEM NUMBER	CATEGORY	NATIONAL STOCK NUMBER	DESCRIPTION	U/M
1	C, O, F	8020-00-263-3873	BRUSH: Medium Bristle	ea
2	O, F	6850-00-274-5421	CLEANING SOLVENT: Dry Cleaning, P-D-680	gl
3	C, O, F	7920-00-205-3571	CLOTH: Soft, Lint- Free	lb
4	C, O, F	9150-00-190-0907	GREASE: GAA, Automotive and Artillery (MIL-G-10924)	lb
5	C, O, F	9150-00-189-6727	OIL, LUBRICATION: General Purpose (MIL-G-2104)	oz
6	O, F	8010-00-111-8010	PAINT: Forest Green (MIL-E-52798)	gl
7	O, F	8010-00-297-0593	PRIMER: TT-P-1757	gl
8	F	8030-00-502-8485	SEALING COMPOUND	gl

APPENDIX F

ILLUSTRATED LIST OF MANUFACTURED ITEMS

F-1. INTRODUCTION

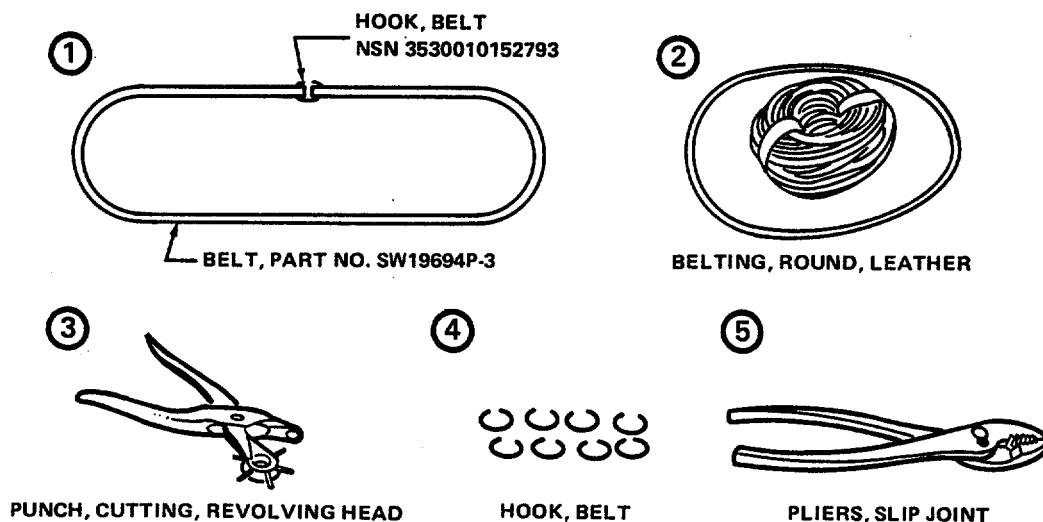
This appendix includes complete instructions for making items authorized to be manufactured or fabricated at organizational maintenance.

- a.* A part number index in alphanumeric order is provided for cross referencing the part number of the item to be manufactured to the figure which covers the fabrication criteria.
- b.* All bulk materials and special tools needed for the manufacture of an item are listed by part number or specification number in a tabular list on the illustration.

F-2. MANUFACTURED ITEMS PART NUMBER INDEX

Part No.	Nomenclature	Figure No.
SW19694P-1	Belt	1
SW19694P-2	Belt	1
SW19694P-3	Belt	1
No Number	Belt	1

F-3. FABRICATION PROCEDURE.



Inches	Cm	Belt
25.0	63.5	SW19694P-1 (Button Machine)
46.0	116.9	SW19694P-2 (Darning Machine)
39.0	99.1	SW19694P-3 (Stitch Machine)
AR (See Note)	AR	No Number (Emergency, no power operating belt)

NOTE

For emergency operation belt, measure the length needed by looping the belt material around the machine pulley taut, and cut to fit. Perform steps 2 and emergency operation pulley, pull through 4 of procedure for fabrication of belts.

To fabricate any of the sewing machine belts (1).

1. Measure and cut belt material (2) to proper length for required belt (see table).
2. With smallest cutter on revolving punch (3) punch hole at each end of belt 1/4 inch from end.
3. Insert belt ring (4) through the holes previously punched.
4. Tighten belt ring together using pliers (5)

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The Adjutant General

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To be distributed in accordance with DA Form 12-25A, Operator, Organizational, Direct and General Support Maintenance Requirements for Clothing and Textile Repair.

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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

 <div style="border: 1px solid black; border-radius: 15px; padding: 5px; display: inline-block; margin-left: 20px;"> <p style="font-size: small; margin: 0;"><i>THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL.</i></p> </div>		SOMETHING WRONG WITH PUBLICATION	
		FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)	
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IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT.			
BE EXACT PIN-POINT WHERE IT IS			
PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.
PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER		SIGN HERE	

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 decagram = 10 grams = .35 ounce
 1 hectogram = 10 decagrams = 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

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
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
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