

# SERVICE MANUAL

## POCKET WELTING MACHINE

series 32



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No safeguard, safety appliance, or device attached to or forming an integral part of this machine shall be removed or made ineffective except for the purpose of making immediate repairs or adjustments.

Any such safeguard, safety appliance, or device removed or made ineffective during the repair or adjustment of such machine shall be replaced immediately upon completion of such repair or adjustment.

No machine shall be operated until such repairs or adjustments have been made and the machine is in good working condition.

Safety glasses should be worn when operating the machine.

DECEMBER 1989

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Gorham, Maine 04038

"Precision and Quality Since 1881."

# MAINTENANCE & TROUBLESHOOTING

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### ELECTRICAL COMPONENTS

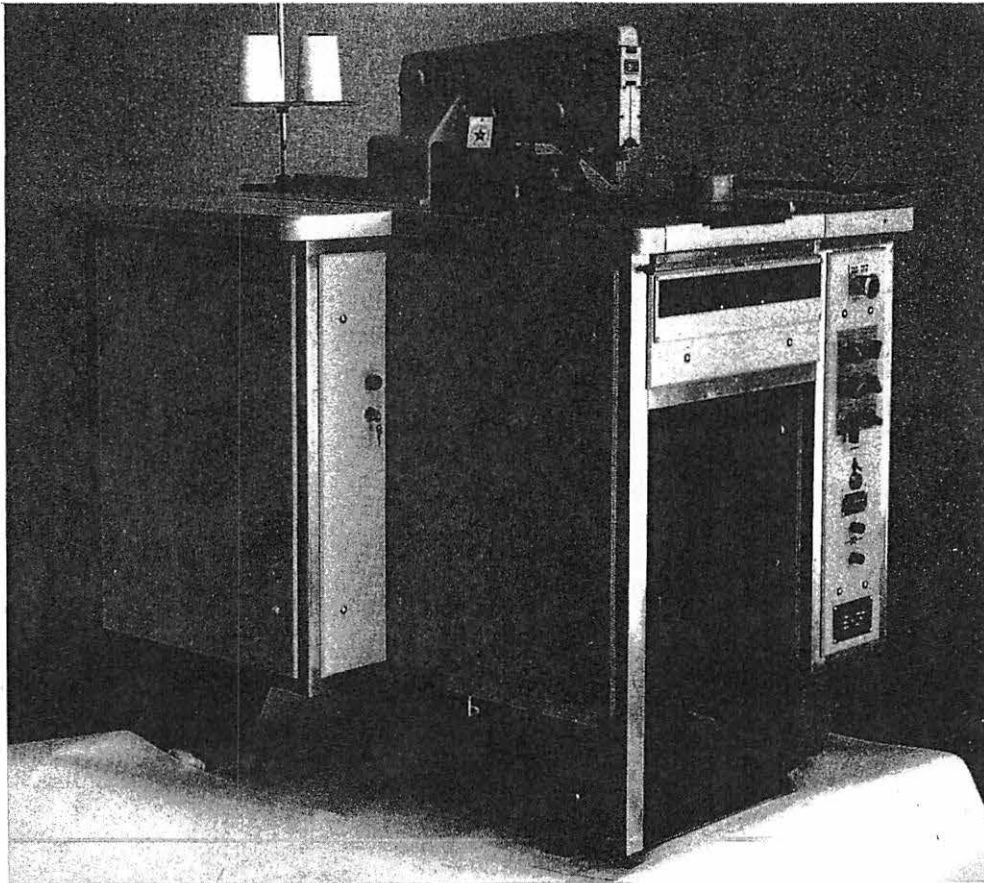
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# REECE WELTING MACHINE — series 32

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**TROUSER MODEL**

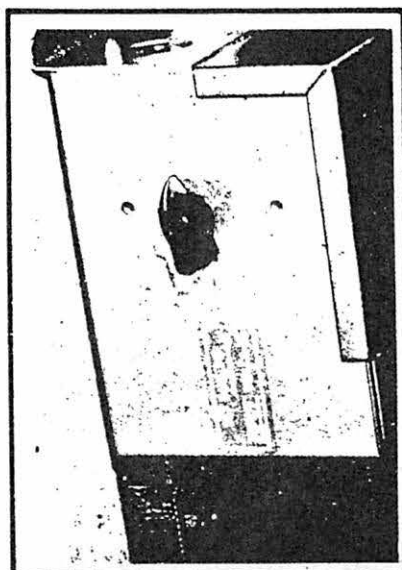
**COAT MODEL ALSO AVAILABLE**

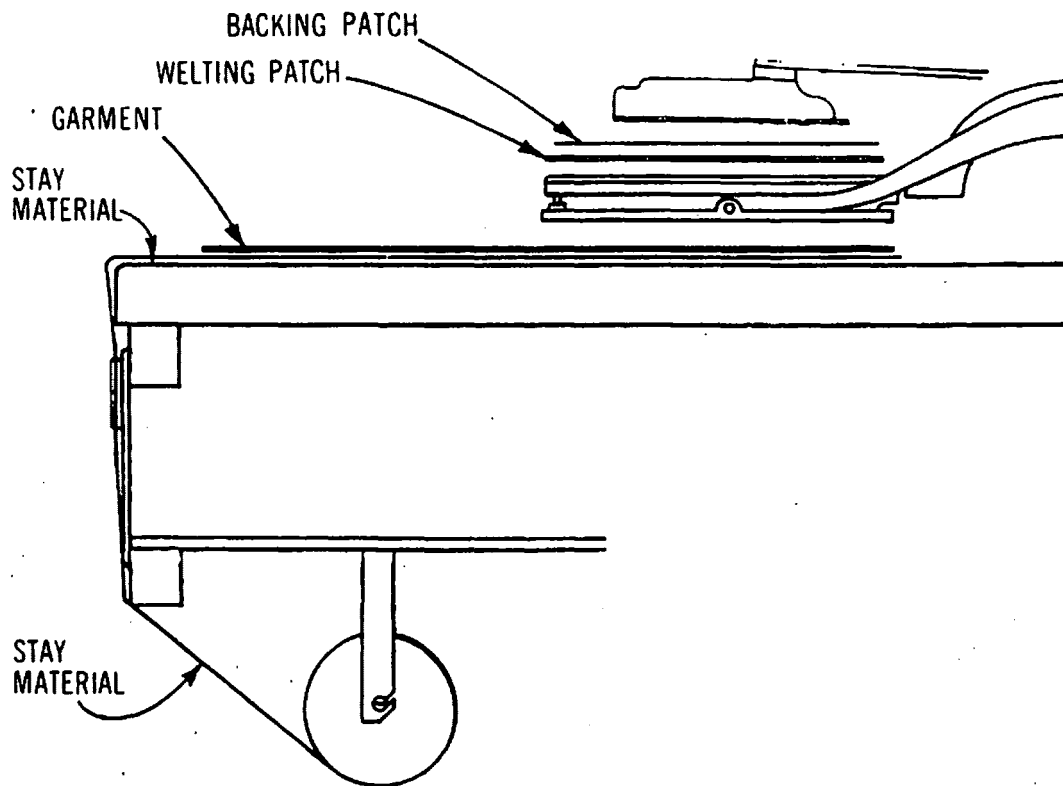
From the Library of Superior Sewing Machine & Supply LLC



## SETTING LINE VOLTAGE

Before connecting the machine to an available outlet, accurately check incoming line voltage with a voltmeter and set dial of Adjustable Transformer to the closest setting corresponding to the incoming line voltage.

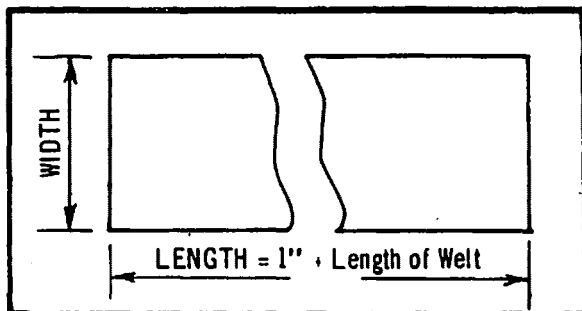




Welting material consists of Welting Patch (garment material), Backing Patch (Pellon L-35) and Stay Material (cotton Silesia). For widths of welting material, refer to chart on Page A3.

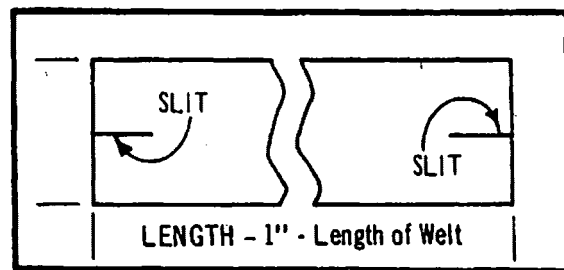
### WELTING PATCH-(Garment Material)

Welting patch length is one inch longer than actual welt. To produce the best effect, patches for horizontal welts should be cut crosswise to selvage except where stripes in the material are over 1/4 of an inch in width. For vertical or diagonal welts, patches should be cut parallel to the selvage.



### BACKING PATCH(Pellon)\*

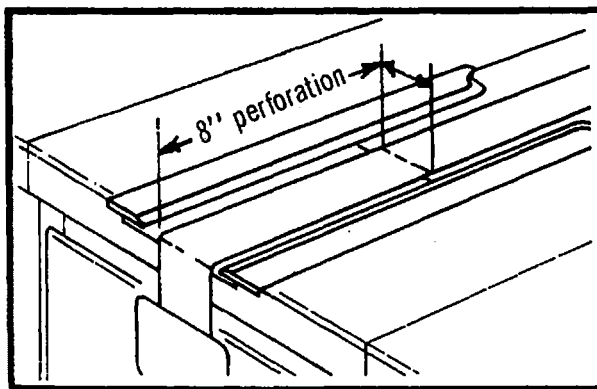
Backing Patch length is the same as Welting Patch, one inch longer than the welt. For double welting use patches with 1/4 of an inch end slits. For single welting and knits, use patches without end slits.



\* Pellon L-35 backing material is recommended. This material may be cut in your own plant or may be obtained precut from the Pellon Corp., N.Y., N.Y. Specify Reece Welting black or white, length, width and with or without end slits.

## STAY MATERIAL

Stay Material is used for pockets on coats and coat linings. The pocket bag is used in place of the stay material in making trouser pockets. Stay material should be (cotton Silesia) with sizing. This material is available in rolls of various widths (refer to chart) with perforations every eight inches. The perforations aid in allowing the operator to separate the stay material while the machine is sewing. Ask your Reece Representative for name and address of suppliers.



## WELTING MATERIAL WIDTHS

SIZE	WELTING PATCH	BACKING PATCH	STAY MATERIAL
3/8"	2-1/2" to 2-3/4"	2-1/2" 2" for Trouser Application	2"
7/16"	2-1/2" to 2-3/4"	2-1/2" 2" for Trouser Application	2"
1/2"	2-3/4" to 3"	2-1/2" 2" for Trouser Application	2"
5/8"	3-1/4" to 3-1/2"	3-1/4"	3"
3/4"	4" to 4-1/4"	3-1/2"	2" - 3"
Overlapping Welt	5-1/4" to 5-1/2"	5"	2" - 3-1/2"
7/8"	4-1/4" to 4-1/2"	3-3/4"	3"
Single Welt		4"	3-1/2"

## APPLICATIONS

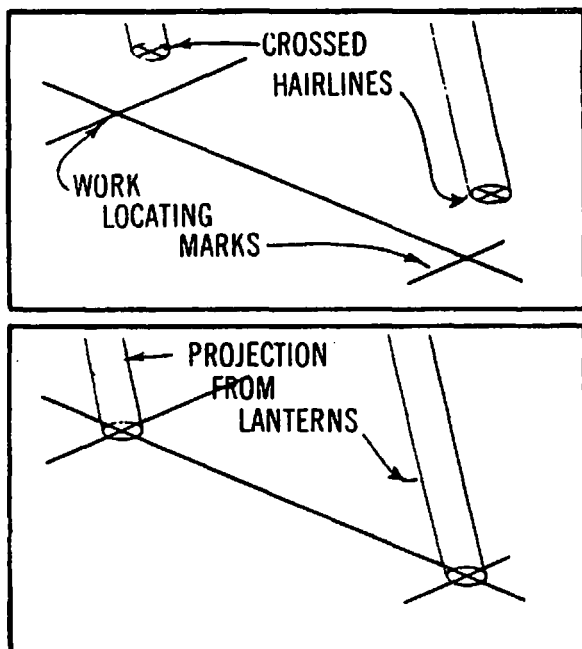
These lanterns were specifically designed to facilitate work location and increase positioning accuracy. They project light slots on the garment which accurately fix the location for positioning work-locating marks, such as drilled holes, which can be applied to garment on the cutting table.

Other types of work-locating marks can, of course, also be utilized; such as darts, seams, slits, chalk marks, etc.

In the production of double-welt sack coat pockets, for example, utilizing drilled holes for locating marks, the forward lantern should be positioned so that when the forward hole is located in the hairline cross-point, it will accurately establish the starting point on every garment. The rear hole will provide accurate pocket alignment as long as it falls anywhere along the vertical light slots of the rear lantern. Thus, the same hole-drilling pattern may be used on double-welt work for all sizes since pocket length is controlled by the Series 32 machine.

Caution should be exercised to avoid drilling holes in the tab areas of the welt as drilling may shred or so reduce a tab area that no effective tab can be formed.

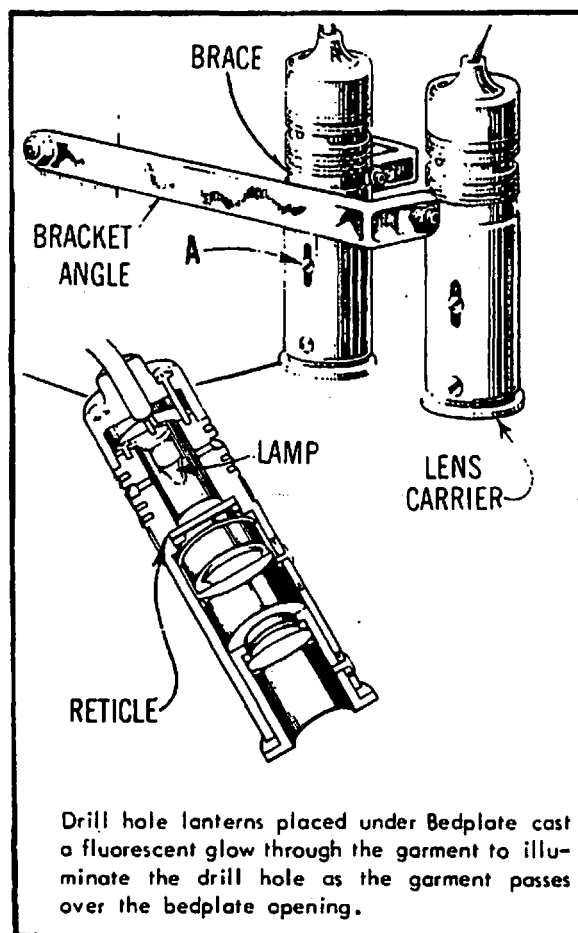
In single-welt work, the rear hole should be accurately located also since it becomes the starting point on alternate pocket operations.



## MAINTENANCE &amp; ADJUSTMENTS

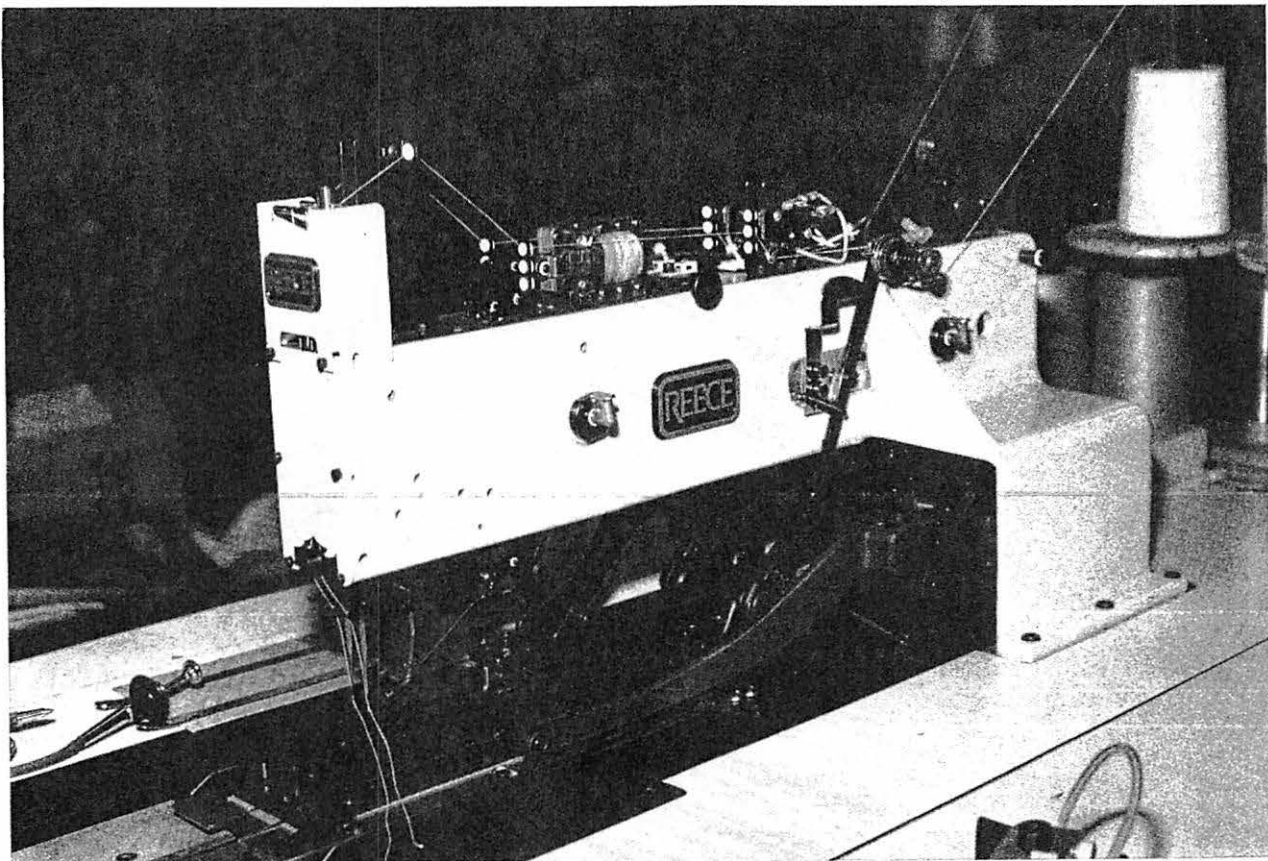
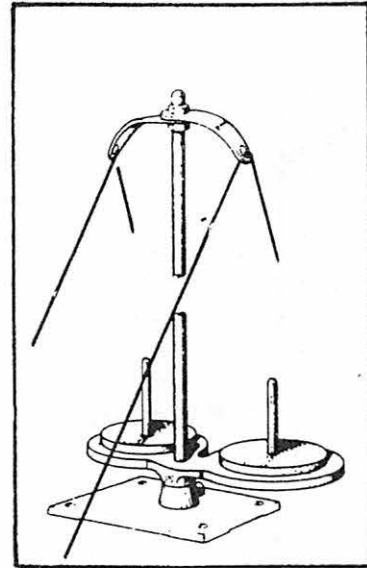
1. To focus light slots, move lens carriers secured by screws (A).
2. Vary lantern bracket angle and bend if necessary so that folding brushes do not obstruct lantern projection when clamp foot is raised.
3. To square light slots with the work, loosen brace and rotate light as necessary.
4. Lamp should be centered over the reticle to centralize reticle in projection, and to obtain maximum intensity.

**NOTE:** Observe that on some materials the light slots are clearer as the garment is being moved into position, than when the garment rests in position. Therefore, while setting lanterns, use a material on which the light slots are clearly visible in rest position. The materials used in production need not be used when setting lanterns.

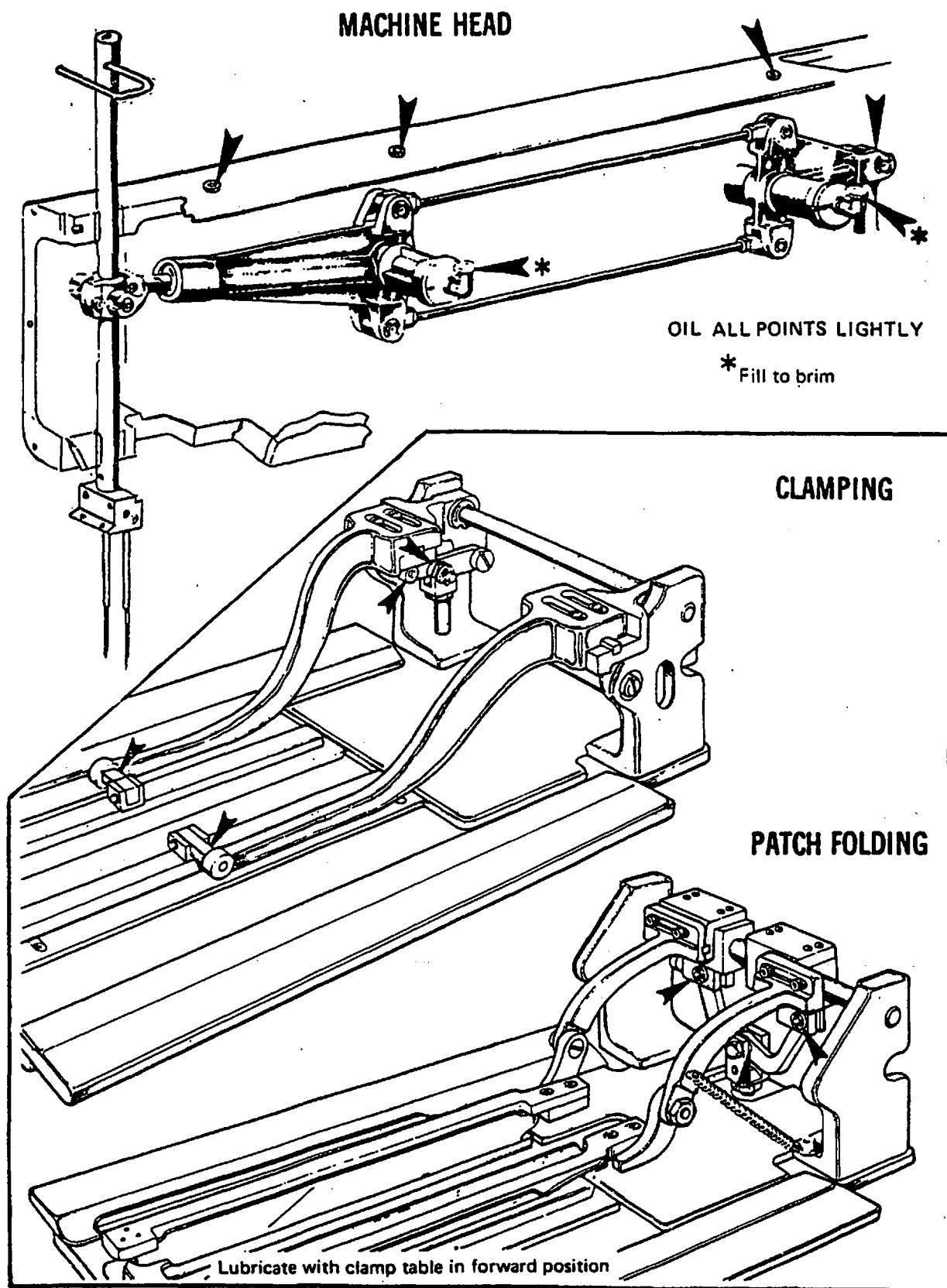


Thread color should be a basic shade to match the garment material, but it need not be an exact match.

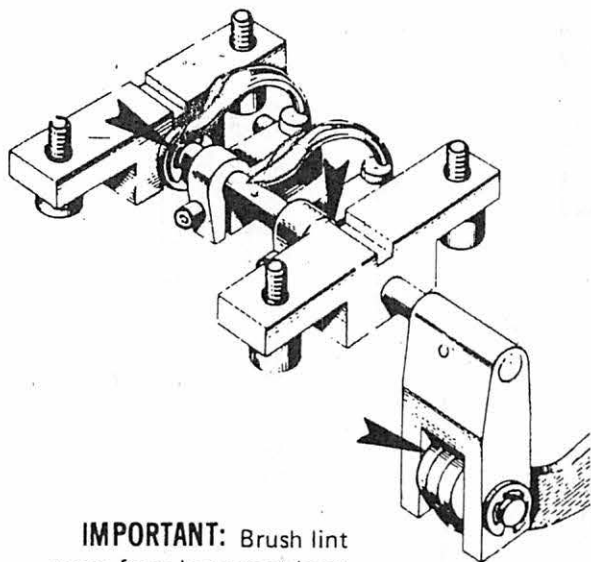
Thread both needles from left to right.







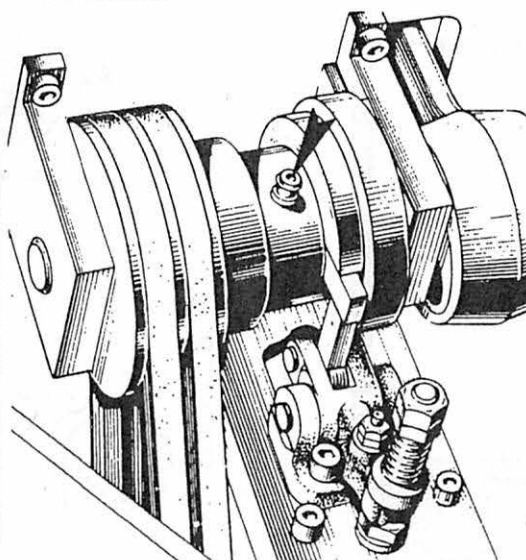
## LOOPERS



**IMPORTANT:** Brush lint away from loopers at least twice daily

## CLUTCH

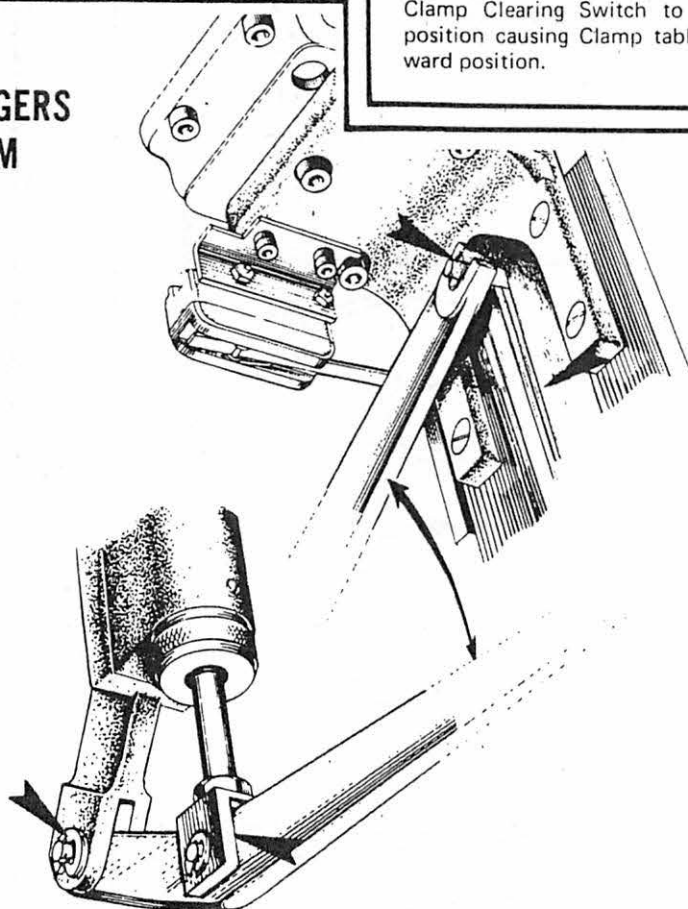
Lubricate weekly or when squeal develops in the Clutch

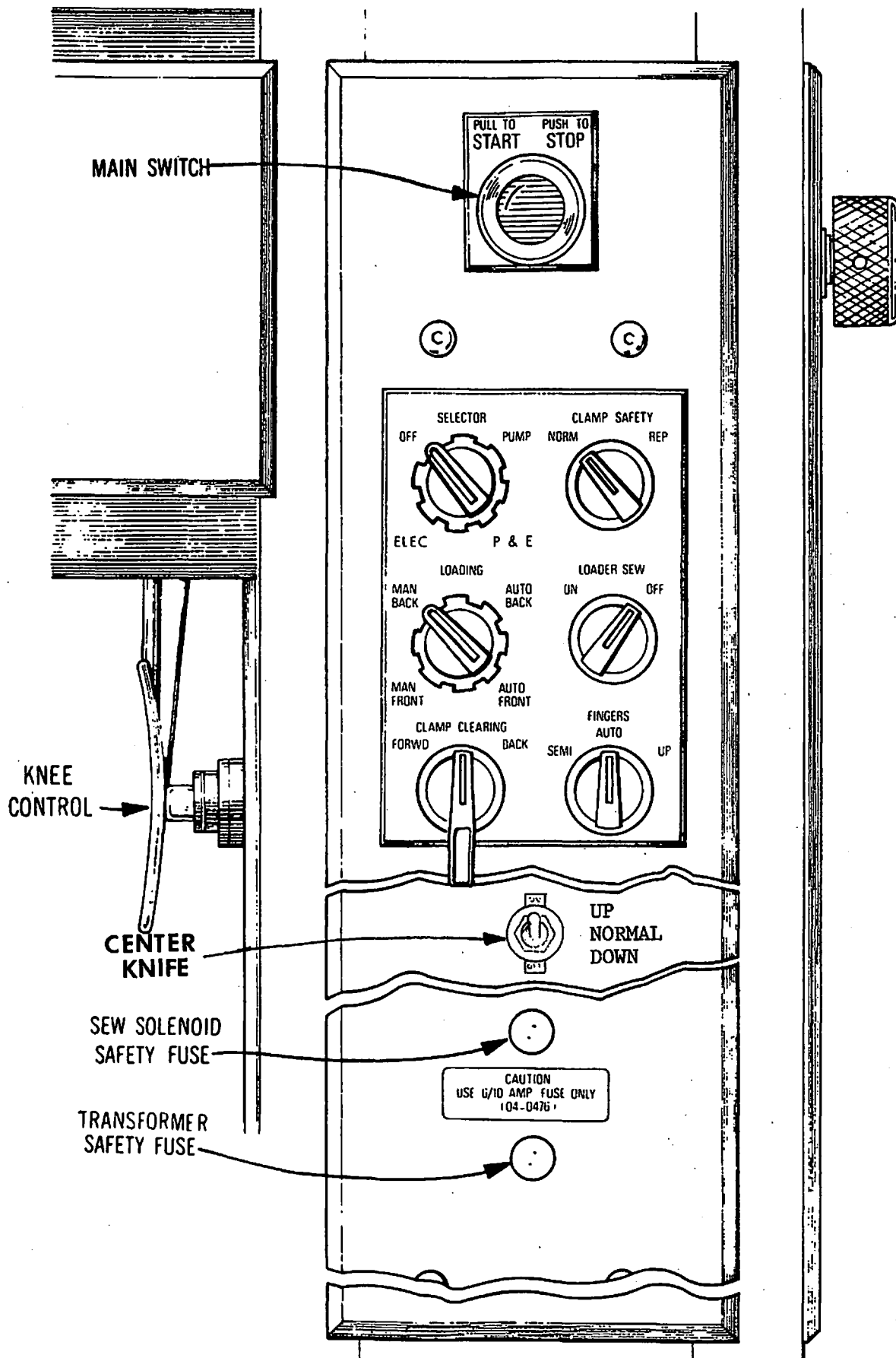


Apply grease to fitting until it begins to come out from sides of Clutch Bearing.

**NOTE:** To easily reach grease fitting, turn Clamp Clearing Switch to "Forwd" (forward) position causing Clamp table to move to its forward position.

## TURNING FINGERS MECHANISM





## MAIN SWITCH (Start/Stop)

To start machine -- pull out.

To stop machine -- push in.

## KNEE CONTROL

To manually activate Sewing Cycle with Loading Switch in "Man Front" or "Man Back" position

To manually activate Tab Knives with the Fingers Switch in "Semi" position

To manually activate Loader Motor for repair purposes.

## SELECTOR SWITCH

**OFF POSITION** — With Main Switch pulled out, the pump, motor and electricity are turned off, but the table light remains on.

**PUMP POSITION** — Electricity is off while pump and motor remain on. This position is used for repairing machine and to turn off Sewing Cycle in event of thread breakage.

**P & E POSITION** — Pump is operating and all electrical components are set to operation. This is the position for regular machine operation.

**ELEC POSITION** — Electricity is on. Pump and Motor are off. Used for unlocking drive shaft. This is also used by servicemen for repairing and checking switches.

## CLAMP SAFETY SWITCH

**NORM POSITION** — Clamp arms function normally.

**REP POSITION** — Used when repairing welts. Prevents clamp foot from raising and prevents machine from sewing.

## LOADING SWITCH

**MAN BACK POSITION** — Used when loading material in the Back position. Also for manual operation of clamping, patch folding and sewing.

**MAN FRONT POSITION** — Used when loading material in the Front position. Also for manual operation of clamping, patch folding and sewing.

**AUTO FRONT POSITION** — Used in this position for Automatic Front Loading.

**NOTE:** Clamp Clearing switch will not operate when switch is in this position. To use Clamp Clearing switch for clearing trapped air from hydraulic lines, first set this switch to "MAN FRONT" or "MAN BACK". Also set Fingers switch to "SEMI". With switches set as indicated, air is cleared from lines by alternately turning Clamp Clearing switch between its "FORWARD" and "BACK" positions.

**AUTO BACK POSITION** — Not recommended.

## LOADER SEW SWITCH

**ON POSITION** — Functions only when machine is in automatic position. Machine will sew automatically when activated.

**OFF POSITION** — Machine will not sew automatically.

## CLAMP CLEARING SWITCH

**FORW POSITION** — Clamp table moves to the forward position.

**BACK POSITION** — Clamp table moves to the back position.

## FINGERS SWITCH

**SEMI POSITION** — Tab Knives will not rise until Knee Switch is activated. This position should be used until the operator becomes proficient in operating the machine.

**AUTO POSITION** — Tab Knives will rise and retract automatically following the sewing cycle.

**UP POSITION** — Tab Knives stay in the "UP" position at the end of the sewing cycle. Used when replacing Tab Knives.

**CAUTION:** Never turn machine off when Tab Knives are being held in the UP position. Damage to the Brush Blades and/or the Tab Knives may result.

## CENTER KNIFE SWITCH

**NORMAL** — Center Knife will fire upward to cut material (comes on only during sew cycle). This is the position for regular machine operation.

**UP** — Center Knife will immediately fire upward and remain activated. This position is useful for servicing the Center Knife.

**DOWN** — Center Knife will immediately fire downward and remain deactivated.

## POSITIONS OF CONTROL PANEL SWITCHES FOR VARIOUS OPERATING PROCEDURES

OPERATING PROCEDURES	CONTROL PANEL SWITCHES							REMARKS
	Start Stop	Selector	Clamp Safety	Loading	Loader Sew	Clamp Clearing	Fingers	
Manual Front Loading	Start	P & E	Normal	Manual Front	On or Off	Center	Auto. or Semi.	Clamp Arms will raise auto. at end of cycle if Fingers Sw. is on "Auto or Semi."
Manual Back Loading	Start	P & E	Normal	Manual Back	On or Off	Center	Auto. or Semi.	Clamp Arms will not raise auto. at cycle end if Fingers switch is on Auto or Semi.
Automatic Front Loading	Start	P & E	Normal	Auto. Front	On	Center	Auto.	Operate the clamp to back position by pedal. Auto. cycle starts when pedal is released.
Auto. Back Loading	NOT RECOMMENDED							
To clear machine of air in hydraulic system	Start	P & E	Normal or Repair	Manual Front or Back	On or Off	Forward and Back	Semi.	Operate clamp clearing switch forward and back. Machine cannot be cleared in auto. position.
To operate patch loader arm manually for aligning, etc.	Start	P & E	Repair	Manual Front or Back	On or Off	Center	Any Position	Clamp all the way back. Depress knee switch to start. Release knee switch to stop.
To release drive shaft to operate manually	Start	E	Normal	Manual Front or Back	On or Off	Center	Any Position	Clamp all the way back. Depress knee switch.
To lock shaft	Start	E	Repair	Manual Front or Back	On or Off	Center	Any Position	Turn handwheel to lock.
To make repairs due to thread breaking, etc.	Start	P & E	Repair	Any Position	On or Off	Center	Any Position	Remove patch when clamp is forward. Operate clamp to back position and insert new patch. Return clamp safety switch to normal.
To raise fingers for changing tab knives	Start	P & E	Normal or Repair	Any Position	On or Off	Center	Up	Clamp all the way forward.
To return fingers to down position.	Start	P & E	Normal or Repair	Any Position	On or Off	Center	Auto. or Semi.	



# OPERATING INSTRUCTIONS

## MACHINE WARM-UP

1. Pull out Main Switch and turn Selector switch to "P & E", ten minutes before starting regular operation.
2. Set Fingers Switch to "Semi" position.
3. Turn Clamp Clearing Switch alternately from "Forward" to "Back" position, several times to clear air from hydraulic lines.
4. Sew and examine a welt on scrap material before starting regular work.

## OPERATING PROCEDURES

### MANUAL-BACK LOADING

1. Fully depress pedal and hold. This will raise the clamp foot and send the clamp table to its back (sewing) position.
2. Position stay or pocketing material.
3. Position garment over stay material.
4. Raise pedal slightly until clamp drops but folding brushes remain open and patch guide is in up position.
5. Place welt and welt backing material on brush folders and under patch guide.
6. Raise pedal all the way to fold welting material.
7. If threads are not retrieved by thread pick-up fingers, draw the thread forward with tweezers hold with light tension — release as machine starts to sew.
8. Press Knee Switch to start sewing.
9. Set Fingers Switch to Semi position and press Knee Switch again for cutting tabs.  
 Note: To set machine for Automatic tab cutting, refer to Control Panel page. Finger Switch, Automatic position.
10. To extract material, depress pedal until clamp foot rises.

### MANUAL-FRONT LOADING

1. Clamp foot is automatically held in raised position and Clamp table will remain in its forward position.
2. Position stay or pocketing material.
3. Position garment over stay material.
4. Depressing and holding pedal all the way down, will cause clamp foot to drop and Clamp table to travel to its back (sewing) position.
5. With pedal depressed, folding brushes remaining opened and patch guide remaining in its up position, place welt and welt backing material on brush folders and under patch guide.
6. Raise pedal all the way to fold welting material.
7. If threads are not retrieved by thread pick-up fingers, with tweezers or similar device, draw them forward and hold with light tension — release as machine starts to sew.
8. Press Knee Switch to sew.
9. Set Fingers Switch to Semi position and press Knee Switch again for cutting tabs.  
 Note: To set machine for Automatic tab cutting, refer to Control Panel page, Fingers Switch, Automatic position.
10. Upon descent of turning fingers, clampfoot will automatically rise, allowing material to be removed.

**AUTOMATIC FRONT LOADING POSITION**

With the machine in the normal stop position (clamp table forward, clamp foot raised, the welt and welt backing material placed in the patch tray.)

1. Trouser pocketing is placed under clamp foot.
2. Trouser leg is placed under clamp foot.
3. Pedal is momentarily depressed, lowering the clamp foot, sending the clamp table to its back position, and activating the automatic cycle.

Upon actuation of the Automatic circuit, the operator should pick up the welt patch and patch backing to insert in patch tray for the next sewing cycle. The operator should also have sufficient time to pick up the trouser pocket for the next sewing cycle and as soon as the trouser is ejected, be ready to position the pocketing.

4. When the clamp table reaches its back position, the patch loader will load the welt and welt backing onto the folding brushes.
5. As the automatic patch loader is returning to its rest position, the machine will automatically start sewing.

If the welt patch is not properly loaded into the folding brushes, pressing the pedal will prevent the machine from starting to sew.

If the machine does not start sewing, the patch loader arm will continue to oscillate. **CAUTION –** Do not shut machine power off by pushing in Main Switch. Doing so will cause clamp table to move to its forward position and may cause damage to the patch loader.

If machine does not start sewing, depressing pedal will stop the patch loader arm from oscillating. Then turn loading switch to its Manual-Front position. Turn machine off.

6. The automatic patch loader will stop when the patch loading arm reaches its rest position.
7. Upon the automatic completion of the sewing and turning fingers cycles, the clamp foot will rise and the actuation of the air ejectors will remove the trousers from the machine.
8. The trouser pocket for the next cycle should be held and readied for positioning as soon as the work is ejected.

After Step #3, the machine functions are completely automatic providing for increased production by allowing the operator to prepare for the next cycle while the machine is producing the welt.

## PROCEDURE FOR RESEWING A WELT

### MANUAL FRONT- MANUAL BACK

**1. Prevent Turning Fingers from rising:**

If the Fingers Switch is set on "Auto", quickly pressing the Knee Switch before sewing cycle is completed, will prevent Turning Fingers from rising. Turning Selector Switch to "Pump" will stop the sewing cycle and will also prevent the Turning Fingers from rising.

**2. Prevent Clamps from rising:**

When Clamp Table reaches the forward position, set Clamp Safety to "Rep" (repair) position. This will prevent Clamp Foot from rising and losing position of garment, and will also open sewing circuit as a safety feature when rethreading the machine.

**3. Remove incompleted Patch and Patch Backing . . .** If Selector Switch was used to prevent the Turning Fingers from rising it should now be turned back to the "P & E" position.

**4. Depress pedal to return clamp table to its back (Start Sewing) position.**

**5. Rethread Machine.**

**6. Insert new Patch and Patch Backing material.**

**7. Set Clamp Safety Switch to "Norm" and resume production of welt.**

### AUTOMATIC PATCH LOADING

**1. Prevent Turning Fingers from rising . . .same as No. 1 above.**

**2. Set Loading Switch to "Man Front".**

**3. Prevent Clamps from rising . . . same as No. 2 above.**

**4. Remove incompleted Patch and Patch backing . . . same as No. 3 above.**

**5. Insert new Patch and Patch Backing material in Patch Tray.**

**6. Depress pedal to return clamp table to its back "Start Sewing" position.**

**7. Rethread Needle.**

**8. Depress and hold pedal to open patch folders.**

**9. Set Clamp Safety Switch to "Norm" position.**

**10. Set Loading Switch to "Auto Front" position.**

**11. Release pedal and resume production of welt.**



# **ELECTRICAL TROUBLESHOOTING & REPAIR**

## **BASIC TROUBLESHOOTING PROCEDURES**

Check that Control Panel Switches are set for the desired Operation Procedure. See Page A10. Determine which function is not operating.

Determining whether Electrical, Hydraulic or Mechanical System or a combination of these systems are at fault.

If involved solenoid is not operating when trying to activate function, the cause of malfunction may be electrical. Refer to Electrical Troubleshooting Section and check the involved circuit.

If involved Solenoid is operating, the cause may be hydraulic. If determined that pump pressure exists, the trouble is then mechanical. Refer to the Mechanical & Hydraulic Section.

**IMPORTANT:** If solenoids do not operate, attempt to actuate them manually. If plunger snaps into place and it is determined that the solenoid is energized, the trouble is then mechanical. Refer to the Hydraulic & Mechanical Section.



# INTRODUCTION TO ELECTRICAL TROUBLESHOOTING & REPAIR

## GENERAL APPROACH

The general approach to isolation of faults in the Reece Series 32 Welting Machine is to identify the circuit in which a malfunction occurs, and to identify the faulty component which is causing the malfunction.

The electrical circuits are grouped functionally, but not physically, according to the function they perform. Each major function is performed by a hydraulic or electrical circuit which is actuated by an electrical solenoid. Movement and timing of the functional parts are initiated by switches placed to be actuated in the desired operational sequence.

The ten major functions that are performed in the Reece series 32 Welting machine are illustrated by wiring diagrams. The actual circuits are shown in the wiring schematic on fold out III

The circuits are isolated by the functions they perform as follows:

1. Clamp Circuit
2. Clamp Table Circuit
3. Patch Folding Circuit
4. Patch Loader Motor Circuit
5. Sew/Center Dense Circuit
6. End Dense Circuit
7. Stop Circuit
8. Thread Pickup Circuit
9. Tab Fingers Circuit
10. Unloader Circuit
11. Center Knife Circuit

Examination of the ten wiring diagrams can provide a basic understanding of their electrical functions. The electrical functions are presented in the normal operational sequence of the machine. When a function cannot be produced in normal operation, one of the components (or more) in that particular wiring diagram can be faulty.

For example, if the clamp will not raise when it should, look in the Clamp Circuit. If the turning fingers will not raise (or lower) look in the Turning Fingers diagram. The same approach should be taken for each apparent failure to function.

A procedure for testing the circuits to locate a faulty component is presented in the troubleshooting

charts. This procedure is keyed to the diagrams and sequential steps by the following code:

For testing malfunctions that are general to the whole machine, the letter G followed by a sequential number identifies the procedural step, (G1), (G2), (G3), etc.

For tests applicable to a particular circuit, the procedural step is identified by a number, from 1 to 10, indicating the circuit being tested in accordance with the list of diagrams above, followed by a sequential letter for each step. The test procedure steps in the Clamp Circuit are (1A), (1B), (1C), etc., and in the Turning Fingers Circuit they are (9A), (9B), (9C), etc. In the End Dense Circuit, the steps are numbered (6A), (6B), (6C), etc.

If a voltage check is specified, the step number is enclosed in a circle (3D), to indicate that power is on; if a resistance or continuity check is specified, the step number will be enclosed in a square (4G) indicating that power is off. Procedures for making voltage and resistance checks are given in paragraphs following.

Wherever these step numbers are noted, they refer to the same step and the same procedure. Those appearing on the wiring diagrams correspond to the same numbers on the pictorial diagrams. On the barrier terminal blocks, the left side is Y, numbered 1Y through 20Y, and the right side is Z, numbered 1Z through 20Z. The circuit board plug terminals are the test points and are numbered from TP1 through TP35 (The letters following these numbers are color codes.)

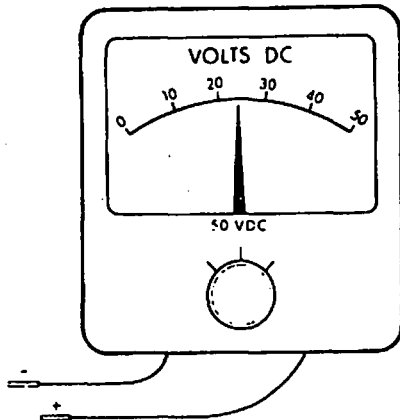
### WIRE COLOR CODE

W	=	White
Y	=	Yellow
O	=	Orange
R	=	Red
P	=	Pink
V	=	Violet
BL	=	Blue
G	=	Green
GY	=	Gray
BR	=	Brown
BK	=	Black

# A16 INTRODUCTION TO ELECTRICAL TROUBLESHOOTING AND REPAIR

## VOLTAGE CHECKS

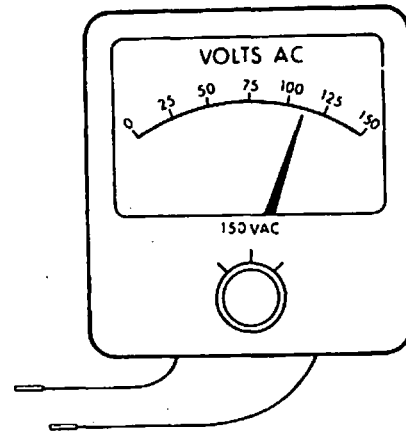
All dc voltage checks in the Reece Series 32 Welting Machine are made with respect to ground. Any standard multimeter or vacuum tube voltmeter can be used, having scales that cover the 24 volt dc and 115 volt ac ranges. It is suggested that a meter with a 50 or 60 volt dc scale and a 150 volt ac scale be used. This brings normal readings to midscale where they are most accurate and easy to read.



The safest practice in making voltage checks is to make the ground connection, either with an alligator clip lead or the white test jack from 14Z, with the power turned off. Then turn on the power and set up the condition specified in the trouble-shooting chart. When the condition has been set up, touch the positive (red) probe to the specified test point or the specified terminal of the barrier terminal block.

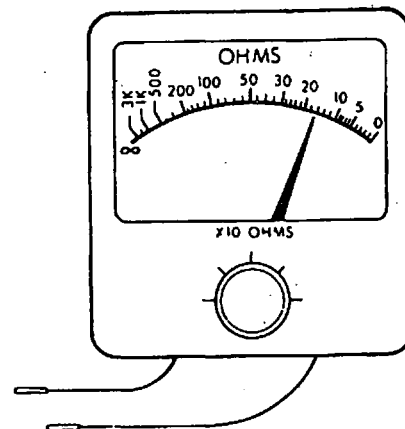
When measuring 24 volts dc, all voltages are positive with respect to ground, so the meter should be set to a dc scale, with the negative probe connected to ground; otherwise the pointer will deflect in the wrong direction and rest hard against the stop.

When checking the 115 volt ac circuits, use extreme caution as the line voltage can be dangerous. Polarity does not have to be observed when measuring ac; the black and red probes are interchangeable. Normal operating voltage can vary from 115 to 125 volts ac.



## CONTINUITY CHECKS

Continuity checks are made with power off and the meter on the ohms scale. The x10 scale is recommended for all resistance and continuity checks in the Reece Series 32 Welting Machine. Much of the cir-



cuitry consists of switches and the path of electrical continuity can be traced through closed contacts which cannot be seen in the switch. When a switch, or series of switches is closed, an electrical path is present in the circuit. Continuity is indicated by a reading (with the power off) of zero ohms, since there is no resistance in the path. (One or two ohms would be considered negligible.) If a switch is not closed when it should be, a reading of infinite resistance is obtained (infinity  $\infty$  on the meter) which is in fact the resistance of the air gap presented by the open switch. When a switch is known to be in the closed position and electrical continuity is not present, the switch is not closing properly and should be replaced. When a switch is known to be in the open position and continuity is present, then the contacts are sticking together creating an undesired closed (or short) circuit. In this case also, the switch should be replaced.

The resistance of most of the solenoids used in the Reece Series 32 Welting Machine is approximately 80 ohms. Any other reading indicates a faulty coil (except for a +5 ohm deviation). When making resistance readings, however, be sure that other elements are not included in the circuit. In the SEW/CENTER DENSE circuit for instance, there are two solenoids in parallel (one an 80 ohm coil and the other a 30 ohm coil), and when both are included in the measurement, the measurement reads approximately 25 ohms.

In the STOP circuit if the reading includes the safety lamp, the lamp filament will add resistance to the reading. Follow the troubleshooting charts carefully when checking the circuit. If a reading is in doubt, disconnect one side of the element to avoid a parallel circuit measurement.

## ALTERNATE TEST POINTS

The test points that are indicated in the troubleshooting chart procedural steps are shown on the wiring diagrams to give a clear understanding of what is being measured in a circuit. In some cases, there are additional test points where the same measurement can be made. In these cases the alternate test points in the circuits are at the same electrical point but a different physical point due to the wire routing and connections. Making the same tests at the alternate points can be useful to reveal breaks in the wires, short circuits, or loose connections.

For this reason, with each wiring diagram there is also a table of main and alternate test points. The alternate test points can be used whenever it is necessary or desirable to isolate troubles in the wiring circuits. When the alternate test point specified is a wire nut, be especially careful to trace the wire correctly from the main test point specified. Do not make checks at the alternate test points unless they are necessary. The location of the wire nuts can be determined by the abbreviations used as follows:

- |      |                            |
|------|----------------------------|
| WNC  | - Wire nut in cabinet      |
| WNH  | - Wire nut in head         |
| WNJB | - Wire nut in junction box |



## G. GENERAL TROUBLESHOOTING CHART

SYMPTOM	MACHINE CONDITIONS	TEST-REMEDY
Electrical circuit and motor dead	MAIN SWITCH <u>    </u> Pull to Start SELECTOR <u>    </u> P & E	Ⓔ1 Circuit breakers open. Close or replace.
Same as above	MAIN SWITCH <u>    </u> Push to Stop SELECTOR <u>    </u> P & E	Ⓔ2 Set meter to the X10 ohms scale and check for continuity between 14Y/16Y and 17Y/19Y. If a reading is obtained (one or two ohms) the 8 amp fuse is good. If meter reads to infinity (00), replace fuse.
115 volt ac circuit dead (probable short circuit)	MAIN SWITCH <u>    </u> Pull to Start SELECTOR <u>    </u> P & E	Ⓔ3 Set voltmeter to the 150 volt ac scale. Check between 16Y and 19Y. If 115 volts is present, the transformer is good. Perform step Ⓔ4  NOTE: If a short circuit is present, isolate by removing fuse, Part No. 05-0058 from large transformer. If the short circuit is still present, it is in the motor, high voltage side of the adjustable transformer, main switch, selector switch or circuit board. If short circuit is not discovered there, it can be either in the machine wiring to solenoids or in the front panel components.
24 volt dc circuit dead	Same as above	Ⓔ4 Check 24 volts Circuit fuse before making this test. Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z. Connect the positive probe to 2Z. Voltage should read 24 volts dc. If no voltage is present, replace transformer Part No. 04-0271.
24 volts dc not available. (possible short circuit)	MAIN SWITCH <u>    </u> Pull to Start SELECTOR <u>    </u> P & E	Ⓔ5 Check lower fuse on front panel. If blown, replace and test for short circuit as in Ⓔ6



SYMPTOM	MACHINE CONDITIONS	TEST-REMEDY
<p>24 volts dc not available — possible short circuit. (continued)</p>	<p>MAIN SWITCH Push to Stop Check to make certain that the fuse is a 6/10 ampere fuse, Part No. 04-0476.</p>	<p>G6 Check for short circuit in 24 volt system by the following procedure:</p> <ol style="list-style-type: none"> <li>(1) Insert new Transformer Safety 6/10 amp. fuse (04-0476)</li> <li>(2) Remove Control Circuit Board</li> <li>(3) Disconnect red wire from large capacitor (22,000 uf)</li> <li>(4) Disconnect one red wire coming from the 24 volt Transformer at the Diode Bride Rectifier.</li> <li>(5) Connect a 24 volt test lamp in series between the red wire, just disconnected and the rectifier terminal from which it has just been removed. (Use Lamp, 04-0253-0-380 mounted in Lamp Holder, 04-0252-0-008 for 24 Volt test lamp)</li> <li>(6) Pull Main Switch to On, and Selector Switch to "E" or "P &amp; E". If 24 volt test lamp lights, there is a short circuit in the 24 volt system. Make a continuity check through all switches and wiring until the short is located. Make a visual check in the area of the Clamp Table Forward switch and also where the machine harness goes through the table frame. Move the harness to help locate possible chafed-wire shorts.</li> </ol>

# 1. CLAMPING CIRCUIT

## GENERAL DESCRIPTION

The clamp circuit raises the clamp or lowers it during the operating cycle (1) while the clamp table is in the front or back position, (2) at the beginning of the cycle for loading and (3) at the end of the cycle for ejection. In the MAN BACK and AUTO BACK loading modes of operation, depressing Clamp Switch (pedal) will raise the clamp for loading.

In the MAN FRONT, AUTO FRONT, and AUTO BACK loading modes of operation, the clamp can be raised and held in the raised position in three different ways:

- (1) Set control panel FINGERS switch to SEMI and press knee actuator. The fingers will raise, closing the Fingers Down switch and will then come down closing the Auto Clamp Up switch and raising the clamp.
- (2) Set control panel FINGERS switch to UP and then to AUTO or SEMI. The same will happen as in (1).
- (3) With the LOADING switch set on MAN FRONT, set the control panel FINGERS switch to AUTO and set the control panel CLAMP CLEARING switch to BACK, then FORWD. Clamp will move back and then forward; the fingers will raise and then go down; the clamp will raise automatically as the Clamp table reaches the forward position.

The clamp can be lowered to its normal, clamp down position by depressing Clamp Switch (pedal) (on MAN FRONT and AUTO FRONT).

The CLAMPING CIRCUIT wiring diagram shows the circuit elements that are involved in operation of the clamp to move it up or down at various points in the operating sequence. A malfunction is indicated by failure of the clamp to respond properly to the switch controls. This diagram will serve as an aid in isolating the cause of a malfunction to one of the elements represented in the wiring diagram. Procedure for correction of any malfunction is given following the circuit description.

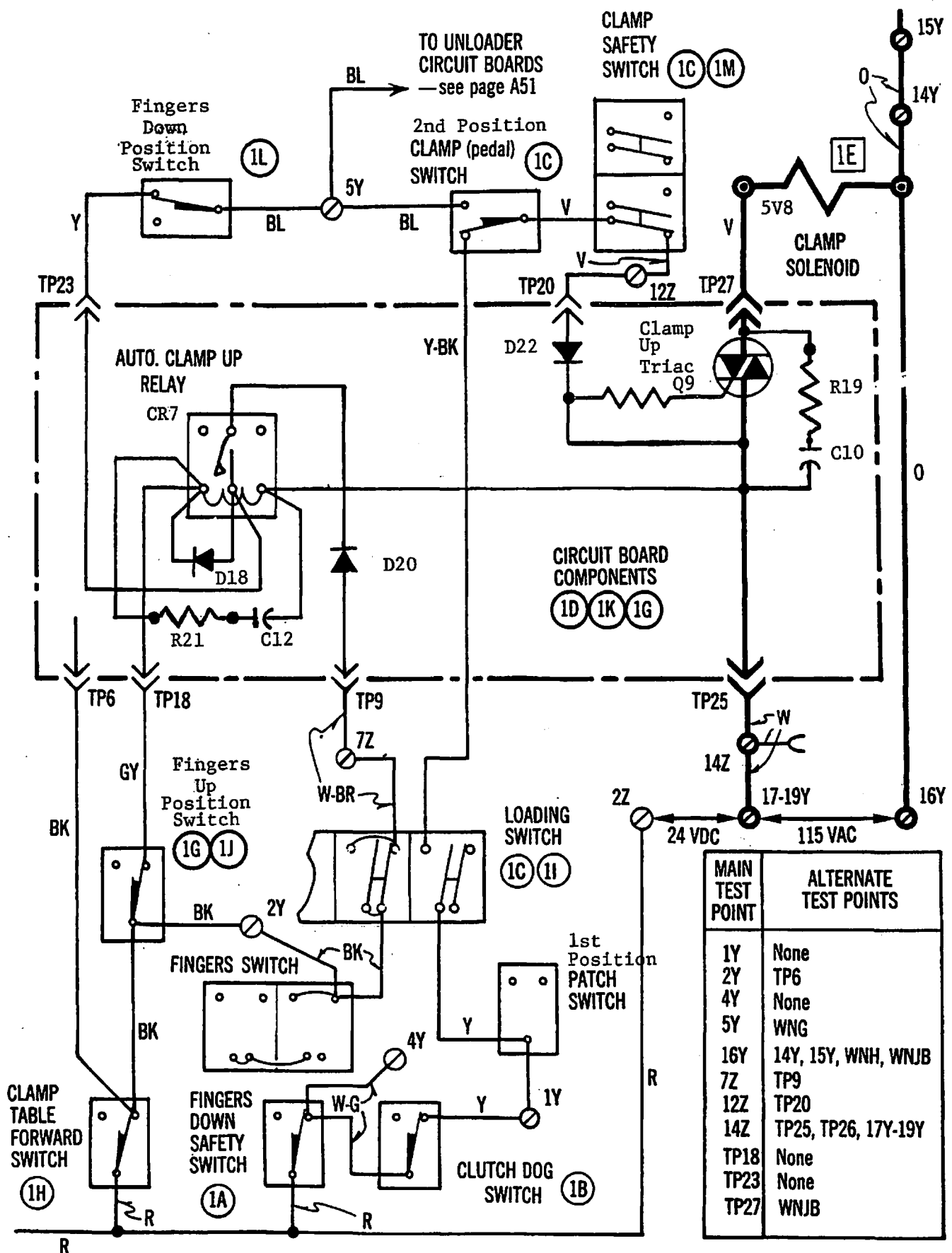
## CIRCUIT DESCRIPTION

The clamping solenoid is energized when the 115 volt ac circuit is completed through triac Q9. The triac conducts the 115 volts ac when 24 volts dc is applied to its gate terminal.

LOADING switch in MAN BACK or AUTO BACK: The 24 volts dc that triggers triac Q9 into conduction is available through the CLAMP SAFETY switch (NORM position), Clamp Switch (pedal) (depressed), LOADING switch, Clutch Dog switch, and Fingers Down Safety switch.

LOADING switch MAN FRONT, AUTO FRONT or BACK: In these positions, the clamp will raise automatically as the turning fingers return to the down position. The 24 volts dc is available through Auto Clamp Up relay CR7. As the turning fingers rise and actuate the Fingers Down switch, relay CR7 is closed. Voltage is then available through Clamp Table Forward switch, LOADING switch, and the contacts of relay CR7. As the turning fingers return to the down position, the Auto Clamp Up switch is actuated making voltage available through the Auto Clamp Up switch, the Clamp Switch (pedal) (in the normal, not actuated position), the Clamp Safety switch to triac Q9.

The 24 volts dc on the CR7 contacts is also returned to the CR7 coil through blocking diode D18 which acts as a holding circuit to keep the coil energized and the contacts closed. This will hold the clamp in the up position until the circuit is broken by actuation of Clamp Switch (pedal). Releasing this Clamp switch will allow clamp to raise again. The holding circuit will break when the table forward switch is deactuated.



MAIN TEST POINT	ALTERNATE TEST POINTS
1Y	None
2Y	TP6
4Y	None
5Y	WNG
16Y	14Y, 15Y, WNH, WNJB
7Z	TP9
12Z	TP20
14Z	TP25, TP26, 17Y-19Y
TP18	None
TP23	None
TP27	WNJB

# 1. CLAMP CIRCUIT TROUBLESHOOTING CHART

A23

SYMPTOM	MACHINE CONDITIONS	TEST-REMEDY
Clamp will not raise.	MAIN SWITCH __ Pull to Start SELECTOR __ P & E LOADING __ MAN BACK	(1A) Check with voltmeter on the 50 volt dc scale. Connect negative probe to ground or 14Z and the positive probe to 4Y. If a 24 volt dc reading is obtained, the Fingers Down Safety switch is good. If not, replace switch.
Same as above	Same as above	(1B) Connect negative probe to ground or 14Z and positive probe to 1Y. If 24 volts dc is obtained, the Clutch Dog switch is good. If not, replace switch.
Same as above	Same as above, also: Close Clamp switch ( pedal )	(1C) With the voltmeter on the 50 volt dc scale, connect the negative probe to 14Z and the positive probe to 12Z. If a 24 volt dc reading is obtained, this will indicate that the LOADING switch, the CLAMP SAFETY switch, and the Clamp switch ( pedal ) are good. If no voltage is indicated make a continuity check through each switch and replace the faulty one.
Same as above	Same as above	(1D) Set the voltmeter to the 150 volt ac scale, and check the voltage between 16Y and TP27. It should read 115 volts, ac. If it does, it indicates that the components on the circuit board are good. Perform next step.
Same as above	MAIN SWITCH __ Push to Stop	(1E) Set the meter to the X10 ohms scale, and check between 16Y and TP27. The reading should be approximately 80 ohms. If it is not, replace the clamp solenoid.
Clamp goes up at wrong time.	MAIN SWITCH __ Pull to Start CLAMP TABLE __ Back SELECTOR __ ELEC	(1F) Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z, and the positive probe to 5Y. If voltage is present trouble is in one or both of the UNLOADING circuit boards or the automatic clamp-up circuit. Replace faulty board.
Clamp tends to jump up before fingers rise.	MAIN SWITCH __ Pull to Start CLAMP TABLE __ Forward FINGERS __ SEMI* SELECTOR __ P & E LOADING __ MAN FRONT *Do not allow fingers to raise and activate the auto clamp up circuit.	(1G) Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 5Y. If no voltage reading is obtained, the Auto Clamp Up relay (RL7) and the Fingers Down switch are good. If 24 volts dc is present, the circuit board or the Fingers Down switch is bad. Make a continuity check through the switch and, if bad, replace. If the switch is good, replace the circuit board.

## 1. CLAMP CIRCUIT TROUBLESHOOTING CHART

Clamp will not raise automatically when it should.	MAIN SWITCH____ Pull to Start SELECTOR____ P & E CLAMP TABLE____ Forward LOADING____ MAN FRONT	1H Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 2Y. If a 24 volt dc reading is obtained, the Clamp Table Forward switch is good. If not, replace switch.
Same as above	Same as above	1I Set the voltmeter to the 50 volt dc scale. Connect the negative probe to 14Z and the positive probe to 7Z. If a 24 volt dc reading is obtained the LOADING switch is good. If not, replace switch.
Same as above	Same as above, also: _____ FINGERS UP	1J Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to TP18. If a 24 volt dc reading is obtained, the Fingers Down switch is good. If not, replace switch.
Same as above	Same as above, also: _____ FINGERS SEMI or AUTO	1K Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to TP23. If a 24 volt dc reading is obtained, the circuit board components and the FINGERS DOWN switch are good. If not, check switch and then replace board if necessary.
Same as above	Same as above	1L Set the voltmeter to the 50 volt dc scale. Connect the negative probe to 14Z and the positive probe to 5Y. If a 24 volt dc reading is obtained, the Auto Clamp-Up switch is good. If not, replace switch.
Same as above	Same as above, also: _____ CLAMP SAFETY NORM	1M Set the voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 12Z. If a 24 volt dc reading is obtained, the CLAMP SAFETY switch is good. If not, replace the switch.
Same as above	Same as above	Repeat steps 1D and 1E

## 2. CLAMP TABLE CONTROL CIRCUIT

A25

### GENERAL DESCRIPTION

The function of the Clamp Table control circuit is to move the clamp table to the back position for start of the sew function. The Clamp Table can be moved to the back position in two ways:

- (1) By turning the CLAMP CLEARING switch on the front panel to the BACK position. (LOADING switch must be in the MAN FRONT or MAN BACK position.)
- (2) By closing Clamp Table Back (pedal) switch.

In each case, the Clamp Table is returned to the forward position by breaking the holding circuit. In the first case this is done by turning the CLAMP CLEARING switch to FORWD and in the second case, the holding circuit is broken when the sew cycle starts, by deactuation of the Clutch Dog switch.

### CIRCUIT DESCRIPTION

The CLAMP TABLE solenoid operates on 115 volts ac when its circuit is completed through Clamp Table triac Q5. Triac Q5 will conduct the 115 volts ac when 24 volts dc is applied to its gate terminal. The 24 volts dc is applied directly to the gate terminal of Q5 and to the coil and contacts of Clamp Table Back relay (CR5) when Clamp Table Back switch is closed. This 24 volts dc comes through the Fingers Down Safety switch when the fingers are down and the switch is closed.

When the CR5 coil is energized, the contacts close and allow 24 volts dc through blocking diode D13 which is a holding circuit that keeps the coil energized and the triac gated and holds the Clamp Table in the back position. This circuit is completed through the CLAMP CLEARING switch, the Clutch Dog switch (which is closed when the machine is not sewing) and the Fingers Down Safety switch.

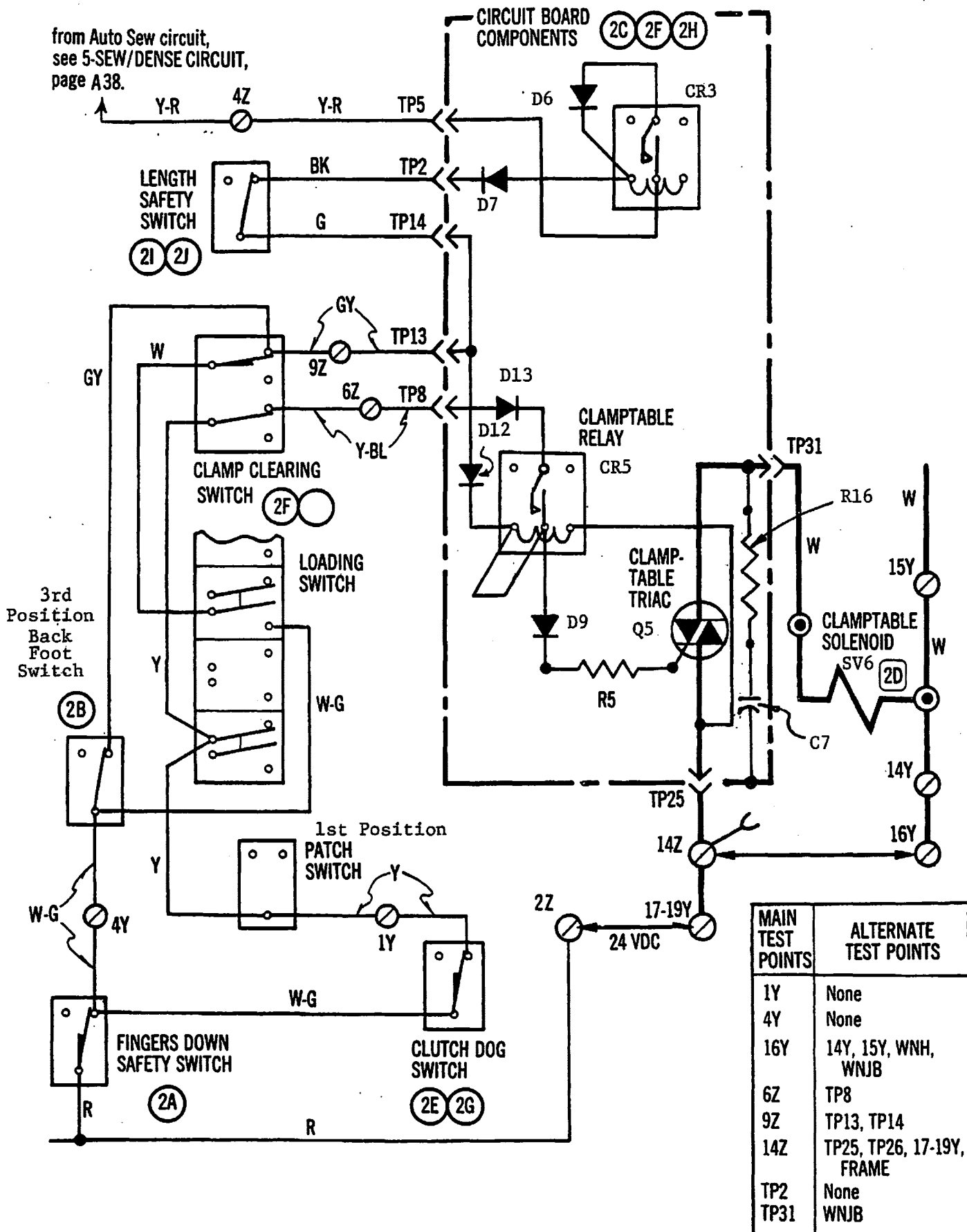
When the CLAMP CLEARING switch is set to the BACK position, it will provide a path for 24 volts dc to the CR5 coil. The 24 volts dc will be available through the Fingers Down Safety switch, Clutch Dog switch and the CLAMP CLEARING switch to the CR5 coil.

When the Clamp Table is not in the forward position, 24 volts dc is available to the CR5 coil to hold it back until the circuit is opened by the Clutch Dog switch or CLAMP CLEARING switch when actuated manually to the FORWD position.

The Length Safety switch will close and hold the Clamp Table back in an oscillating condition whenever the sewing circuit does not function properly. This will prevent oversewing of the pocket.



## 2. CLAMPTABLE CIRCUIT WIRING DIAGRAM



# A27

From the Library of Superior Sewing Machine & Supply LLC

## 2. CLAMP TABLE TROUBLESHOOTING CHART

SYMPTOM	MACHINE CONDITIONS	TEST-REMEDY
Clamp Table will not feed forward while sewing.	MAIN SWITCH ____ Pull to Start SELECTOR ____ P & E CLAMP TABLE ____ Back LOADING ____ MAN BACK Close and release knee switch.	(2G) Connect the negative probe to ground or 14Z and the positive probe to 1Y. If no voltage reading is obtained, the Clutch Dog switch is good. If a voltage reading is obtained, replace the switch.  NOTE: If clamp table will not feed forward while sewing, connect the negative probe to ground or 14Z and the positive probe to 9Z. If a 24 volt dc reading is obtained, either Clamp Table, Back Switch (pedal) or the Length Safety switch are faulty. Make a continuity check through each, and replace faulty switch.
Same as above	Same as above	(2H) Set the voltmeter to the 150 volt ac scale. Connect one probe to 16Y and the other probe to TP31. If 115 volts ac is present, replace the circuit board.
Length Safety not returning table	MAIN SWITCH ____ Pull to Start CLAMP TABLE ____ Back LOADING ____ MAN BACK SELECTOR ____ ELEC Actuate knee switch to energize start sewing solenoid.	(2I) Set voltmeter to 50 volt dc scale. Connect the negative probe to ground or 14Z, and the positive probe to 9Z. Manually close the Length Safety Switch. A reading of 24 volts dc should be obtained. If voltage is not present, reset the Length Safety switch actuator block.
Same as above	Same as above	(2J) Set the voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to TP2. If a 24 volt dc reading is obtained, check the Sew/Center Dense Circuit (5).
Clamp Table returns to back position at end of sewing cycle.	(Reference only)	Check adjustment of Length Safety switch in relation to Length switch. (Refer to Switch Adjustment Section.)

## GENERAL DESCRIPTION

The function of the Patch Folding circuit is to open the patch folder (brushes) for patch loading. The patch folder may be opened when the Clamp Table is in the AUTO FRONT or AUTO BACK position. The patch folder (brushes) can be opened in any of the following ways:

- (1) With the Clamp Table in the back position, closing Patch Switch (pedal) will open the patch folder (brushes).
- (2) Whenever the Clamp Table moves forward and the Clamp Table Forward switch closes, the patch folder (brushes) will open.
- (3) Whenever the LOADING switch is in the AUTO FRONT position, and the Clamp Table moves to the back position, the patch folder (brushes) will stay open until the patch is automatically inserted; and will then close when the Patch Loader switch is actuated.

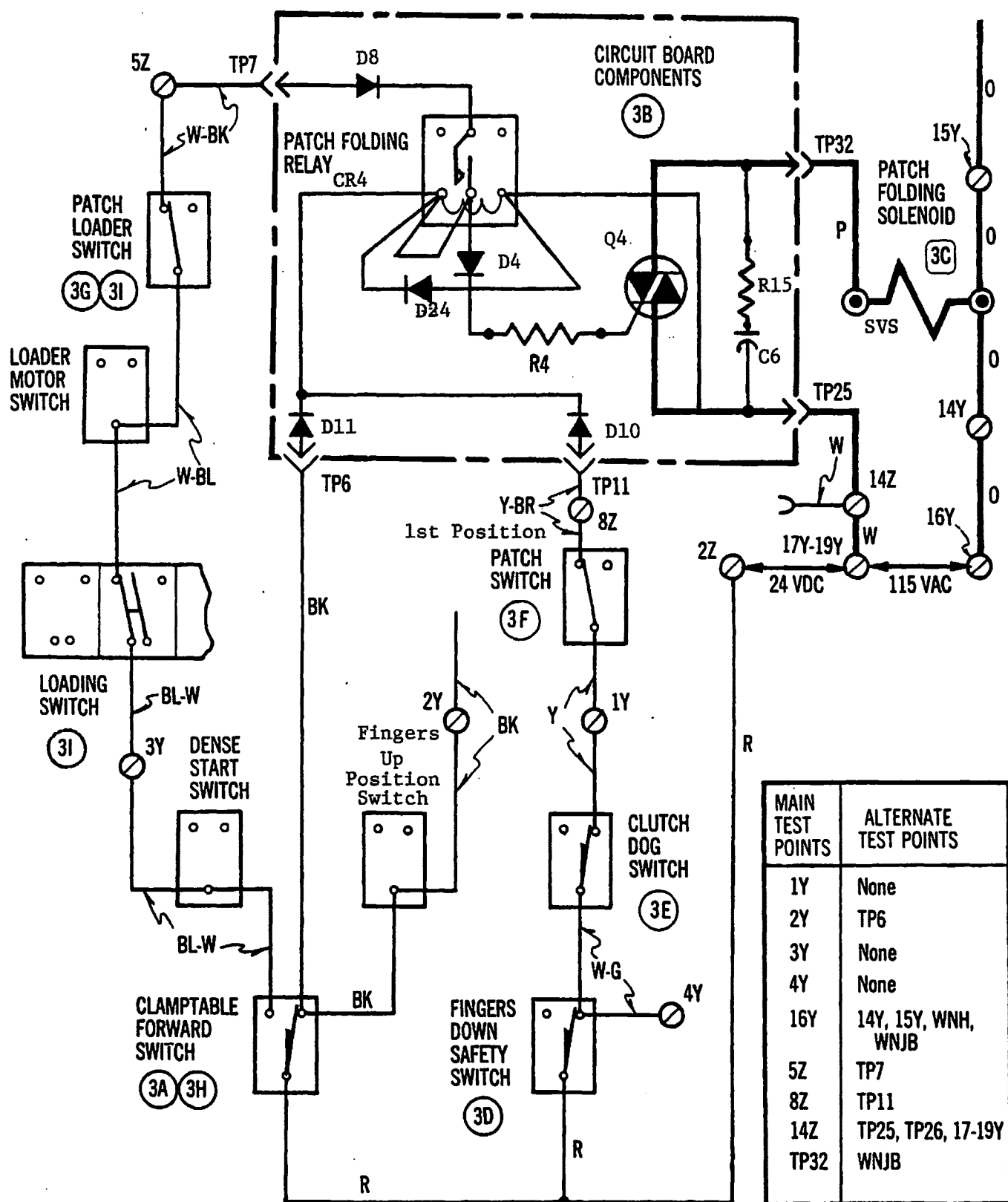
## CIRCUIT DESCRIPTION

The patch solenoid is energized by 115 volts ac when its 115 volt circuit is completed through triac Q4. The triac conducts the 115 volts ac when 24 volts dc is applied to its gate terminal. The 24 volts dc to operate the triac may be received through three different paths depending upon the functional operation of the machine.

Whenever the Clamp Table moves forward, and closes Clamp Table Forward switch, 24 volts dc is supplied directly through blocking diode D11 to the Q4 gate terminal. With the LOADING switch in the AUTO FRONT position, a holding circuit is set up through Patch switch (pedal) by energizing relay CR4, and closing the relay contacts, making a holding circuit through the Clamp Table Forward switch (deactivated), Patch Loader switch and CR4 relay. The patch folder (brushes) will remain open until the patch loader arm actuates the patch loader switch, or when the Table Clamp Forward switch is deactivated.

The 24 volts dc for the holding circuit is supplied through the Table Forward switch in the back position, the LOADING switch in AUTO position, the Patch Loader switch in the normally closed position, and blocking diode D8.

Whenever Clamp Table is back, and the Fingers Down Safety switch is closed, the 24 volts to energize to CR4 coil and triac Q4 will be supplied when Patch Switch (pedal) is closed, and the patch folder (brushes) will open.



# A31

SYMPTOM	MACHINE CONDITIONS	TEST-REMEDY
Patch folders not open in front position	MAIN SWITCH ____ Pull to Start SELECTOR ____ P & E	3A Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 2Y. If a 24 volt dc reading is obtained, the Clamp Table Forward switch is good. If not, replace switch.
Same as above	Same as above	3B Set voltmeter to the 150 volt ac scale. Connect one probe to 16Y and the other probe to TP32. If the meter reads 115 volts ac, the circuit board components are good. If not, replace circuit board.
Same as above	MAIN SWITCH ____ Push to Stop	3C Set the meter to the X10 ohms scale. Connect the probes between 16Y and TP32. The meter should read approximately 80 ohms. If it does not, replace the patch folding solenoid.
Patch folders will not open when Patch switch (pedal) is closed.	MAIN SWITCH ____ Pull to Start CLAMP TABLE ____ Back SELECTOR ____ P & E	3D Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 4Y. If a 24 volt dc reading is obtained, the Fingers Down Safety switch is good. If not, replace switch.
Same as above	Same as above	3E Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 1Y. If a 24 volt dc reading is obtained, the Clutch Dog switch is good. If not, replace switch.
Same as above	Same as above, also: LOADING ____ MAN FRONT or MAN BACK  Patch switch ____ Closed	3F Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 8Z. If a 24 volt dc reading is obtained, the Patch switch (pedal) is good. If not, replace switch.



SYMPTOM	MACHINE CONDITIONS	TEST-REMEDY
Patch folders will not close when loader arm goes in.	MAIN SWITCH __ Pull to Start CLAMP TABLE __ Back SELECTOR ____ ELEC LOADING ____ AUTO FRONT	(3G) Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z, and the positive probe to 5Z. The meter should read 24 volts dc until the loader arm goes all the way in. At this point the circuit should open. If it does not, reset the Patch Loader switch.
Patch folders will not stay open on AUTO cycle.	MAIN SWITCH __ Pull to Start SELECTOR ____ P & E LOADING ____ AUTO FRONT	(3H) Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 3Y. If a 24 volt dc reading is obtained, the Table Forward switch is good. If not, replace switch.
Same as above	Same as above CLAMP TABLE __ Back	(3I) Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 5Z. If a 24 volt dc reading is obtained, the LOADING switch and the Patch Loader switch are good. If not, replace faulty switch. Check for 24 volts dc at Alternate TP7. If 24 volts dc is present, replace circuit board.

# 4. AUTOMATIC PATCH LOADING CIRCUIT **A33**

## GENERAL DESCRIPTION

The automatic patch loader motor circuit is an automatic feature of the Reece Series 32 Welting Machine which allows automatic feeding of patches for increased production speed. It operates with the LOADING switch set to AUTO FRONT or AUTO BACK positions, for normal operation. It can be operated in the MAN FRONT and MAN BACK position of the LOADING switch for the purpose of adjusting the position of the drive.

It is actuated to start when the Automatic Patch Loader (auto) Start switch (APL Motor Start-auto Switch) is closed; which happens when the Clamp table is all the way back. When the loading arm swings into position to load a patch, it closes the Patch Loader switch, which breaks the patch open holding circuit and closes the patch folder (brushes). Position of the arm is controlled by an eccentric cam on the loader motor. The arm then reverses direction and starts back. On the way back it actuates the Auto Sewing switch and starts the machine sewing. When the arm reaches the rest position it opens the Loader Motor switch which breaks the circuit to the motor and stops it.

For adjustment purposes, the loader motor can be operated with the Control panel LOADING switch in the MAN FRONT or MAN BACK positions. The CLAMP SAFETY switch is in the REP position and the motor is actuated by the knee control. The arm moves only while the knee control is pressed, and it can be actuated in small increments by repeated pressing of the knee switch.

## CIRCUIT DESCRIPTION

The Patch Loader Motor operates on 115 volts ac when its circuit is completed through triac Q7. Triac Q7 conducts 115 volts ac when 24 volts dc is applied to its gate terminal.

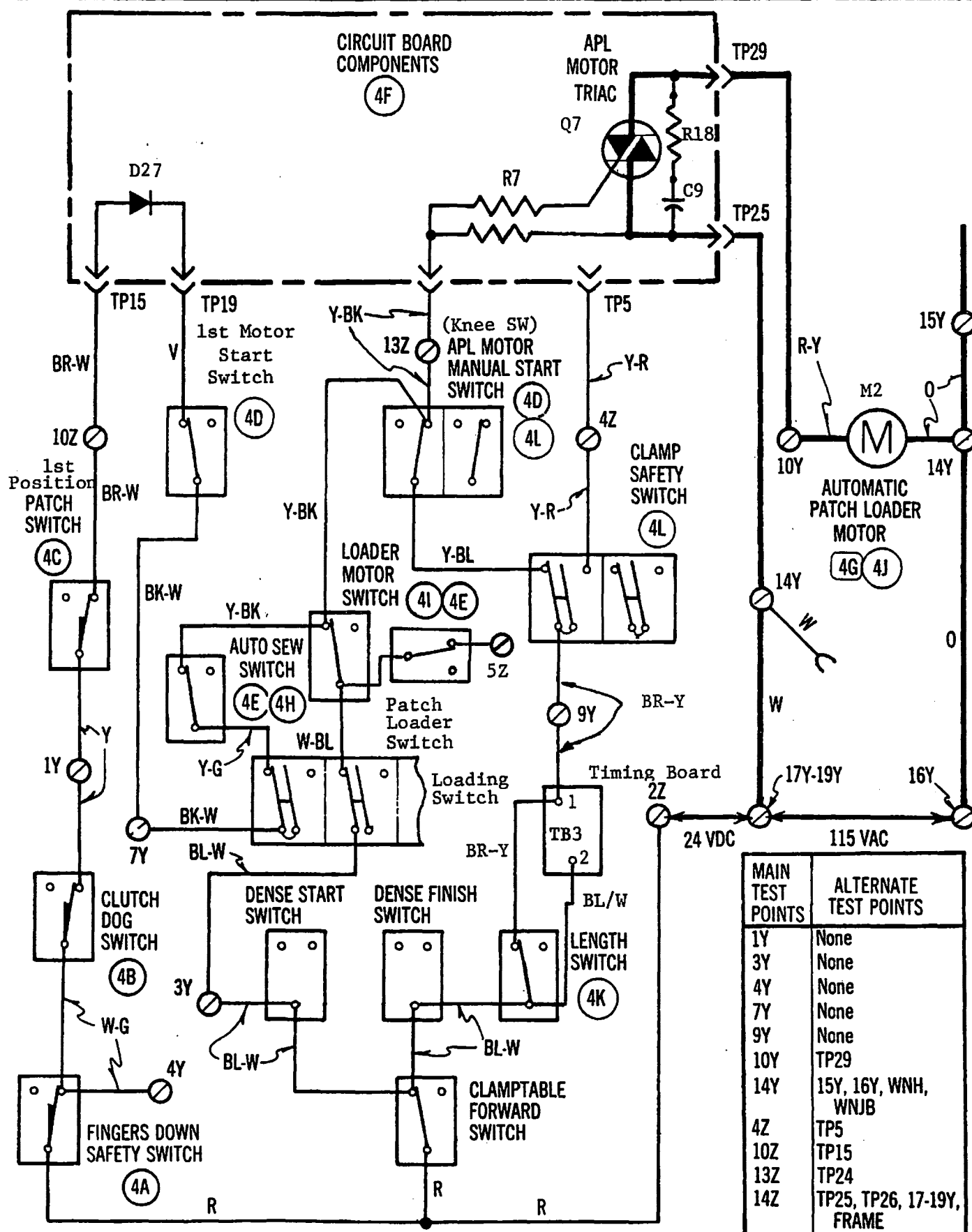
In normal operation of the patch loader motor, the Control Panel LOADING Switch is set to AUTO FRONT. When the Clamp Table goes back, it actuates the APL Motor Start (auto) switch to start the loader motor. The 24 volts dc is then supplied through the Fingers Down Safety Switch, the Clutch Dog Switch, and Patch Switch (pedal) which is in the normally closed position. As shown in the wiring diagram, the 24 volts dc then goes through blocking diode D27, and APL Motor Auto Start Switch) and LOADING Switch Contacts A, through the Auto Sewing switch (in the normally closed position, and then to the gate terminal of the triac.)

In automatic operation, Patch Switch (pedal) acts as a *safety switch* to stop an automatic cycle in the event that a patch is not loaded properly, and if depressed before Auto Sewing switch is actuated.

The Patch Loader motor holding circuit is made by supplying 24 volts dc from the Clamp Table Forward switch through Control panel LOADING switch contacts B, and the Loader Motor switch, to the triac. The circuit is broken when the arm actuates the Loader Motor switch back at the rest position.

When the loader motor is operated with the LOADING switch in the MAN FRONT or MAN BACK position, pressing the knee Control completes a path through the CLAMP SAFETY switch (in the REP position) from the Length and Clamp Table Forward switches.

#### 4. AUTOMATIC PATCH LOADING CIRCUIT WIRING DIAGRAM



SYMPTOM	MACHINE CONDITIONS	TEST-REMEDY
Patch Loader will not start.	MAIN SWITCH ____ Pull to Start SELECTOR ____ P & E CLAMP TABLE ____ Back LOADING ____ AUTO FRONT	<div>4A</div> Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z, and the positive probe to 4Y. If a 24 volt dc reading is obtained, the Fingers Down Safety switch is good. If not, replace switch.
Same as above	Same as above	<div>4B</div> Connect the negative probe to ground or 14Z, and the positive probe to 1Y. If a 24 volt dc reading is obtained, the Clutch Dog switch is good. If not, replace switch.
Same as above	Same as above	<div>4C</div> Connect the negative probe to ground or 14Z, and the positive probe to 10Z. If a 24 volt dc reading is obtained, the Patch switch (pedal) is good. If not, replace switch.
Same as above	Same as above	<div>4D</div> Connect the negative probe to ground or 14Z, and the positive probe to 7Y. If a 24 volt dc reading is obtained, the APL Motor (auto) Start switch is good. If not, replace switch.
Same as above	Same as above	<div>4E</div> Connect the negative probe to ground or 14Z, and the positive probe to 13Z. If a 24 volt dc reading is obtained, the Loader Motor switch and the Auto Sewing switch are both good. If not, replace faulty switch. (The Auto Sewing switch would most probably be the faulty one.
Same as above	Same as above	<div>4F</div> Set the voltmeter to the 150 volt ac scale. Connect the probes to 14Y and 10Y. If a reading of 115 volts ac is obtained, the circuit board components are good. If not, replace board.
Same as above	MAIN SWITCH ____ Push to Stop	<div>4G</div> Set the meter to the X10 ohms scale. Connect the probes to 14Y and 10Y. If a reading of approximately 10 ohms is obtained, the Patch Loader Motor is good. If not, replace motor.

# A36 4. AUTOMATIC PATCH LOADING CIRCUIT TROUBLESHOOTING

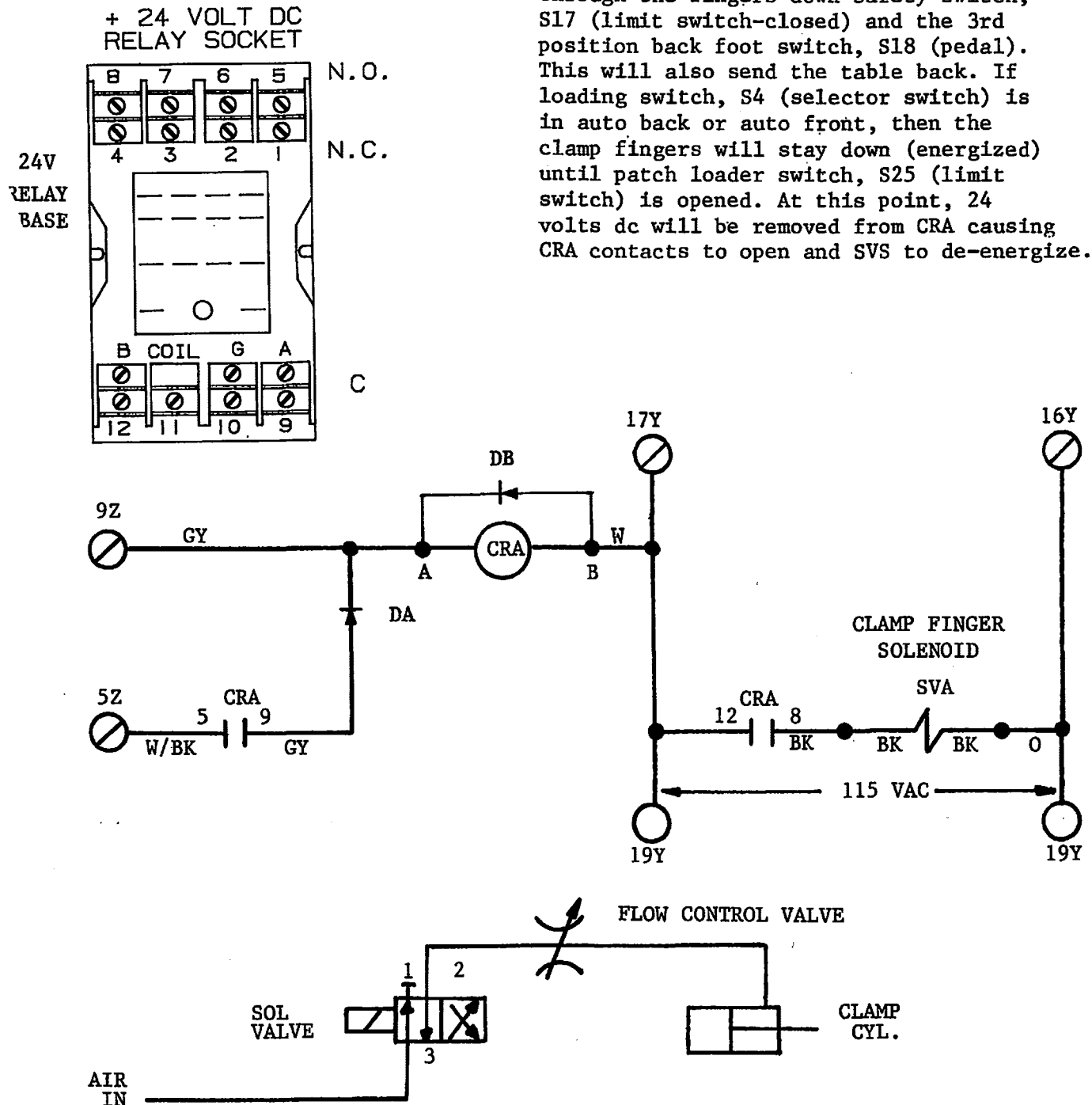
SYMPTOM	MACHINE CONDITIONS	TEST-REMEDY
Machine Starts sewing when loader arm goes in.	MAIN SWITCH ___ Pull to Start CLAMP TABLE ___ Back SELECTOR ___ ELEC LOADING ___ AUTO FRONT	(4H) VISUAL CHECK. Roller lever on Automatic Sew switch is closing when arm goes in. Readjust switch (See page A58.) Also check Patch Folding Safety switch.
Patch Loader Motor does not stop when machine is sewing.	MAIN SWITCH ___ Pull to Start SELECTOR ___ P & E LOADING ___ AUTO FRONT LOADER SEW ___ ON Remove patch tray arm. CLAMP TABLE ___ Back Sewing circuit energized	(4I) Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 13Z. The 24 volt dc circuit should be broken when the Loader Motor switch is actuated. If it is not, replace the Loader Motor switch.
Same as above	Same as above	(4J) VISUAL CHECK. Check motor brake to see that motor does not coast beyond the opening of Loader Motor switch.
Machine fails to sew after Patch Loader Motor Circuit is checked.	(Reference only)	See Sew/Center Dense Circuit Troubleshooting Chart page A39.
Patch loader will not start in MANUAL operation for maintenance adjustments.	MAIN SWITCH ___ Pull to Start SELECTOR ___ P & E LOADING ___ MAN FRONT CLAMP SAFETY ___ REP CLAMP TABLE ___ Back Knee switch ___ Closed	(4K) Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 9Y. If a 24 volt dc reading is obtained, the Length switch is good. If not, replace switch.
Same as above	Same as above	(4L) Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 13Z. If a 24 volt dc reading is obtained, the APL Motor Manual Start Switch and CLAMP SAFETY switch are good. If not, replace faulty switch.

# 4.A. CLAMP FINGERS (PART OF PATCH LOADER) (OPTION) A37

## GENERAL DESCRIPTION

Clamp fingers actuate to hold the welting patch and pella in position while the loader arm swings into position. To vary the speed of the clamp fingers; a flow control valve is located in the electrical panel.

The clamp fingers on the patch loader are closed when SVA is energized. The clamp fingers solenoid (SVA) operates on 115 volts ac when its circuit is completed by the closing of CRA's contacts. 24 volts dc is supplied to CRA through the fingers down safety switch, S17 (limit switch-closed) and the 3rd position back foot switch, S18 (pedal). This will also send the table back. If loading switch, S4 (selector switch) is in auto back or auto front, then the clamp fingers will stay down (energized) until patch loader switch, S25 (limit switch) is opened. At this point, 24 volts dc will be removed from CRA causing CRA contacts to open and SVS to de-energize.





# A38

# NOTES

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## 5. SEW/CENTER DENSE CIRCUIT

### GENERAL DESCRIPTION

The sew circuit starts the sewing function and operates the machine in sew mode until length and timing switches shifts operation back to the normal stop condition. The center dense circuit operates with the sew circuit to control the normal density of the stitches. The End circuit operates at the beginning and end of the sew cycle to provide increased stitch density. The sew function is started manually by the actuation of the knee control, and is started automatically when Auto Sewing switch is closed by movement of the loader arm.

### CIRCUIT DESCRIPTION

The start sewing and center dense solenoids are energized at the same time when the 115 volt ac circuit is completed through sew/center dense triac Q2. A 0.6 ampere safety fuse in series between the triac and coil protects the start sewing solenoid from current overload. This circuit is wired to operate in conjunction with the stop circuit so that it is always controlled by either sew or stop.

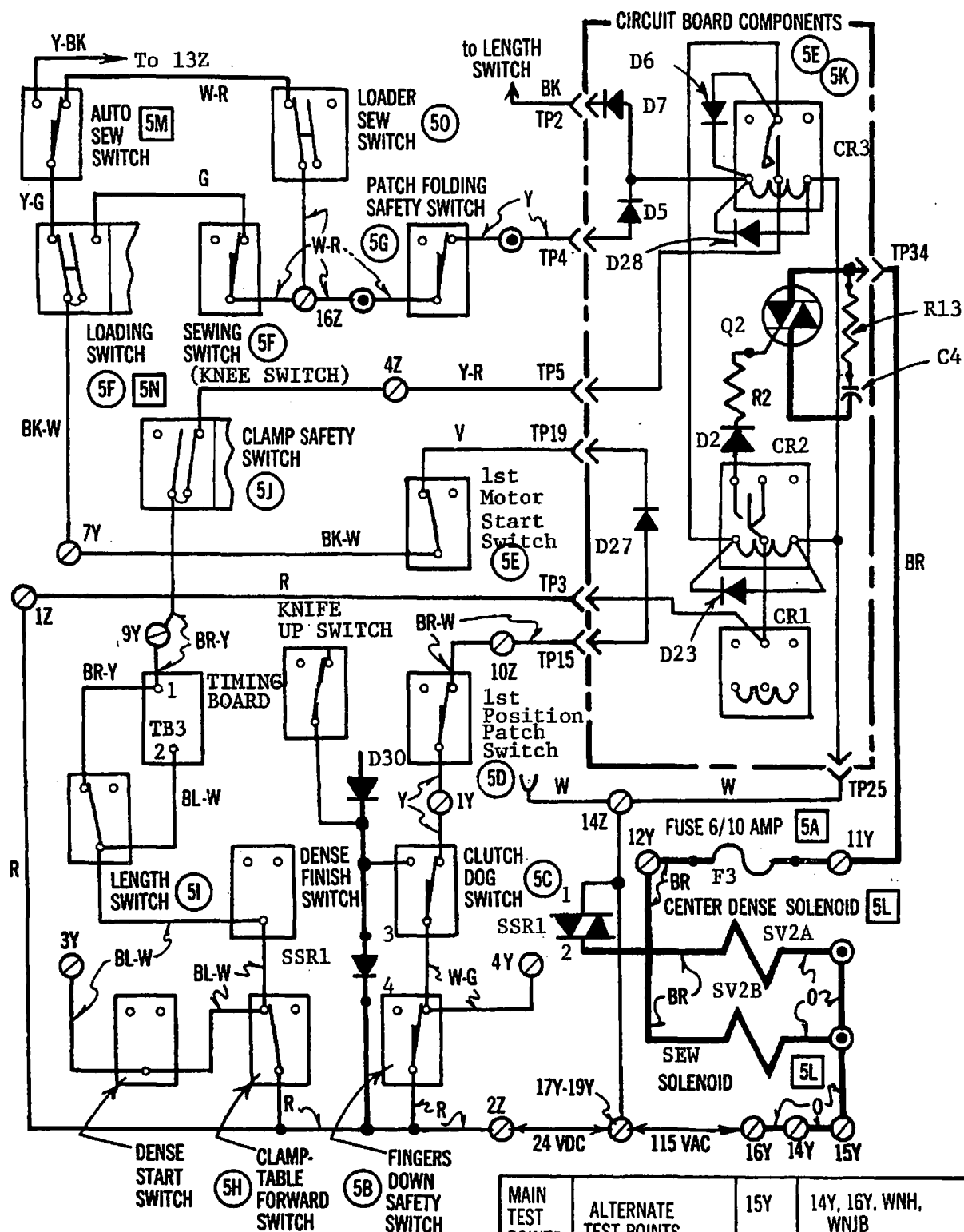
The sew/stop relay CR2 is a double contact relay which remains normally in a closed (stop) position whenever the sew circuit is not completed. In this condition, 24 volts dc is always applied to keep the stop solenoid energized and prevent sewing.

Sewing is initiated by the knee control or Auto Sewing switch when Clamp table is in BACK position and there are no safety circuits open to prevent operation of triac Q2.

The sew solenoid is energized when the 24 volts dc is shifted from the stop circuit to the sew circuit by shifting of the CR2 contacts from the stop position to the sew position. The CR2 coil is energized when the contacts of CR3 are closed. CR3 is closed when 24 vdc is applied to its coil through the Fingers Down Safety switch, the Clutch Dog switch, Patch switch (pedal), APL Motor (auto) Start Switch and the LOADING switch. From this point the voltage path depends on the position of the LOADING switch. In the AUTO positions voltage is available through the Auto Sewing switch, the Loader Sew switch, the Patch Folding Safety switch, and diode D5 to the coil of CR3. In the MAN positions, voltage is available through the Knee Sewing switch, the Patch Folding Safety switch, and diode D5 to the coil of CR3.

When the coil is energized, a holding circuit is made by providing 24 volts dc from Clamp Table Forward switch through the Length, Timing, and CLAMP SAFETY switches to the contacts of CR3. The 24 volts dc from the CR3 contacts is also returned, through diode D6, to the coil of CR3 as a holding voltage.

A path for 24 volts dc is also provided through diode D7 to Clamp table control circuit to hold table back while sewing as long as the Length Safety switch remains closed. This prevents oversewing of the pocket in the event the Length or Timing switch fails to stop the sewing and the Length Safety switch is actuated.



MAIN TEST POINTS	ALTERNATE TEST POINTS	15Y	14Y, 16Y, WNH, WNJB
1Y	None	10Z	TP15
3Y	None	14Z	TP25, TP26, 17-19Y, FRAME
4Y	None	16Z	WNJB
7Y	None	4Z	TP5
9Y	None	TP2	None
11Y	TP34	TP4	WNJB
12Y	WNJB	TP19	None

# 5. SEW/CENTER DENSE CIRCUIT TROUBLESHOOTING CHART

# A41

SYMPTOM	MACHINE CONDITIONS	TEST-REMEDY
Machine fails to sew in manual positions	MAIN SWITCH___ Push to Stop	(5A) Set meter on X10 ohms scale and check for continuity between 11Y and 12Y. If a reading is obtained (one or two ohms) the 0.6 ampere fuse is good. If meter reads infinity ( $\infty$ ), replace fuse.
Same as above	MAIN SWITCH___ Pull to Start SELECTOR___ P & E CLAMP TABLE___ Back LOADING___ MAN BACK or MAN FRONT CLAMP SAFETY___ Normal	(5B) Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 4Y. If a 24 volt dc reading is obtained, the Fingers Down Safety switch is good. If not, replace switch.
Same as above	Same as above	(5C) Set the voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 1Y. If a 24 volt dc reading is obtained, the Clutch Dog switch is good. If not, replace switch
Same as above	Same as above	(5D) Connect the negative probe to ground or 14Z and the positive probe to 10Z. If a 24 volt dc reading is obtained, the Patch switch (pedal) is good. If not, replace switch.
Same as above	Same as above	(5E) Connect the negative probe to ground or 14Z and the positive probe to TP19. If a 24 volt dc reading is obtained, diode SR1 is good. If not, replace the circuit board. Connect the positive probe to 7Y. If 24 volts dc is still not present, replace the APL Motor Auto Start switch.
Same as above	Same as above, also: Close Knee switch	(5F) Set the voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z, and the positive probe to 16Z. If a 24 volt dc reading is obtained, the LOADING switch and sewing switch are good. If not, replace first one switch, then the other if necessary and recheck.
Same as above	Same as above	(5G) Set the voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to TP4. If a 24 volt dc reading is obtained, the Patch Folding Safety Switch is good. If not, replace switch.
Same as above	Same as above, also;	(5H) Set the voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 3Y. If a 24 volt dc reading is obtained, the Clamp Table Forward switch is good. If not, replace switch.

# 5. SEW/CENTER DENSE CIRCUIT TROUBLESHOOTING CHART

Same as above	Same as above	5I	Set the voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 9Y. If a 24 volt dc reading is obtained, the Length switch is good. If not, replace switch.
Same as above	Same as above	5J	Set the voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 4Z. If a 24 volt dc reading is obtained, the Clamp Safety switch is good. If not, replace the switch.
Same as above	Same as above, also: Press Knee Control	5K	Set the voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to TP2. If a 24 volt dc reading is obtained, the circuit board components are good. If not, replace circuit board.
Same as above	MAIN SWITCH __ Push to Stop	5L	Set the meter to the X10 ohms scale. Connect the probes between 15Y and 12Y. The meter should read approximately 25 ohms. If it does both Center Dense and Start Sewing solenoids are good. If the meter reads approximately 80 ohms, replace the Start Sewing solenoid. If the meter reads 30 ohms, replace the center dense solenoid.
Machine fails to sew in Auto positions.	MAIN SWITCH __ Push to Stop Close Auto Sewing switch  Open switch.	5M	Set meter to the X10 ohms scale. Make a continuity check through terminals (from yellow wire with green stripe to white wire with red stripe). If continuity is present, the switch is good in closed position. Repeat between yellow wire with green stripe to yellow wire with black stripe. If continuity is present Auto Sewing switch is good in normal position. If continuity is not present in both positions replace Auto Sewing switch.
Machine fails to sew in Auto positions.	MAIN SWITCH __ Push to Stop LOADING _____ AUTO FRONT	5N	Set meter to the X10 ohms scale. Make continuity check through terminals of the LOADING switch at the black/white striped wire and the yellow/green striped wire. If continuity is present, the LOADING switch is good. If not, replace switch.
Same as above	MAIN SWITCH __ Pull to Start LOADING _____ AUTO FRONT CLAMP TABLE __ Back Auto Sewing Switch __ Closed LOADER SEW __ ON	5O	Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 16Z. If a 24 volt dc reading is obtained, the LOADER SEW panel switch is good. If not, replace switch.
Machine starts sewing when loader arm goes in.	(Reference only)		See Patch Loader Motor Circuit ④.
Machine fails to sew and Patch Loader keeps running.	(Reference only)		See Patch Loader Motor Circuit ④.  IF MACHINE FAILS TO STOP SEWING, REFER TO STOP CIRCUIT ⑦.

## GENERAL DESCRIPTION

The function of the end dense circuit is to change the stitching at the start and at the end of the stitching cycle (ends of the pocket) from normal density (center group long stitches) to end density (short stitches). This is accomplished by energizing the end dense solenoid at the start of the stitching cycle and just before it reaches the end and stops sewing. This solenoid operates to control the density of the stitch at the beginning and end of the sewing cycle, alternately operating through the Dense Start and Dense Finish switches for time controlled durations.

Triac Q8 conducts the 115 volts ac when 24 volts dc is applied to its gate terminal.

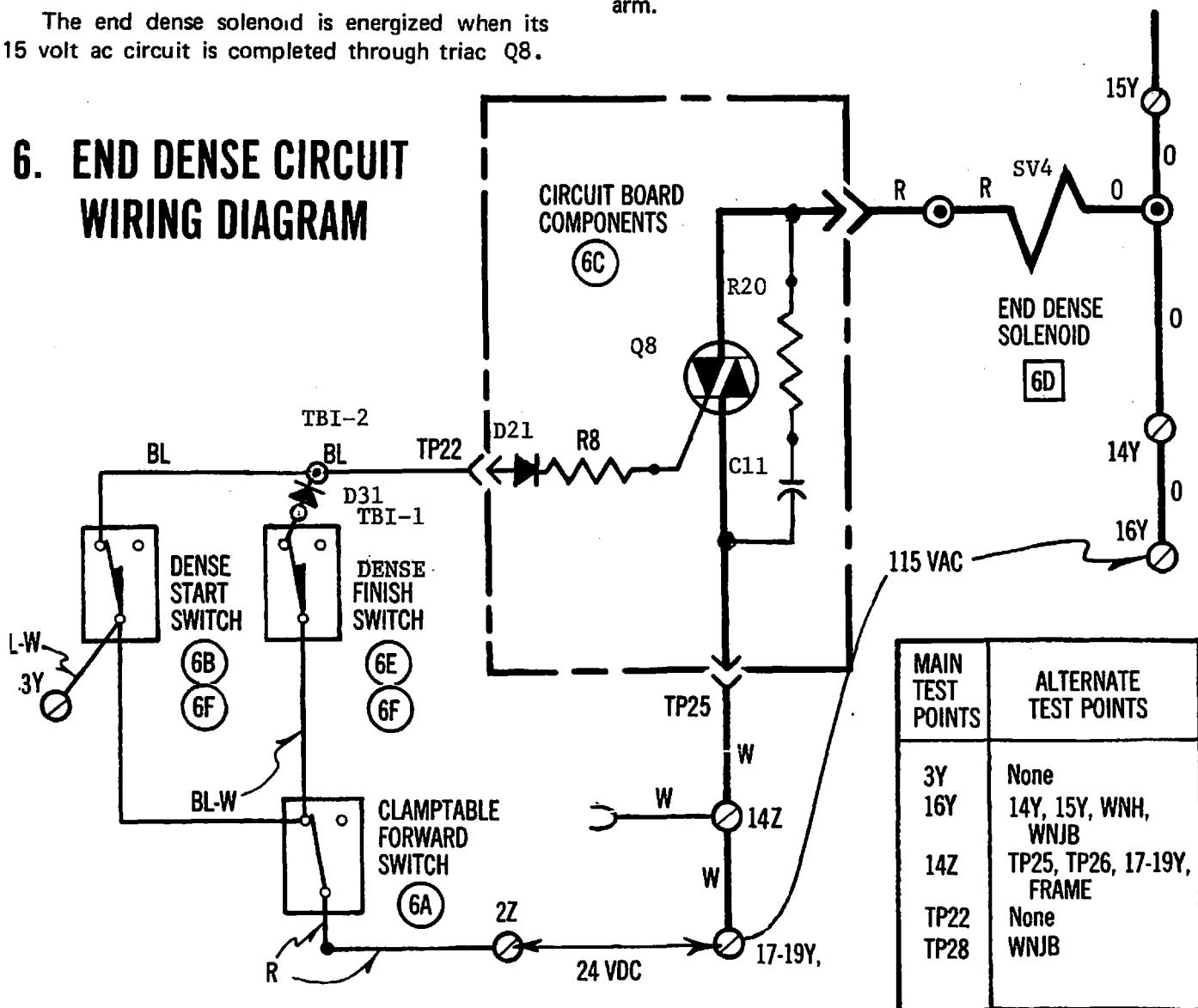
The dense start circuit directs 24 volts dc to triac Q8 through the Clamp Table Forward and Dense Start switches when the Clamp table is in the back position. The Dense Start switch is actuated when the clamp table travels forward a short distance in a sewing cycle and opens the dense start circuit, thereby de-energizing the end dense solenoid.

The Dense Finish switch is actuated at the end of the pocket sewing cycle. It is ganged with the Length switch and actuated by the same lever when a block set on a roller bracket passes over the switch arm.

## CIRCUIT DESCRIPTION

The end dense solenoid is energized when its 15 volt ac circuit is completed through triac Q8.

## 6. END DENSE CIRCUIT WIRING DIAGRAM





SYMPTOM	MACHINE CONDITIONS	TEST-REMEDY
No End Dense at start	MAIN SWITCH _____ Pull to Start SELECTOR _____ P & E CLAMP TABLE _____ Back	⑥A Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z, and the positive probe to 3Y. If a 24 volt dc reading is obtained, the Clamp Table Forward switch is good. If not, replace switch.
Same as above	Same as above	⑥B Set the voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to TP22. If a 24 volt dc reading is obtained, the Dense Start Switch is good. If not, replace the switch.
Same as above	Same as above	⑥C Set the voltmeter to the 150 volt ac scale. Connect the probes to 16Y and TP28. If a 115 volt reading is obtained, the circuit board components are good. If not, replace the circuit board.
Same as above	MAIN SWITCH _____ Push to Stop	⑥D Set the meter to the X10 ohms scale. Connect the probes to 16Y and TP28. The meter should read approximately 80 ohms. If it does not, replace the end dense solenoid.
No End Dense at finish.	MAIN SWITCH _____ Pull to Start CLAMP TABLE _____ Back SELECTOR _____ ELEC Pull Clamp Table forward one half inch.	⑥E Set the voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to TP22. Close the Dense Finish switch by hand. The meter should read 24 volts dc. If it does not, reset the Dense Finish switch.
Dense stitch through whole cycle.	Same as above	⑥F Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to TP22. If a 24 volt dc reading is obtained, make a continuity check through the Dense Start and Dense Finish switches and replace faulty switch. (Continuity through either switch in this check indicates sticking contacts.)

# 7. STOP SEWING CIRCUIT

A45

## CIRCUIT DESCRIPTION

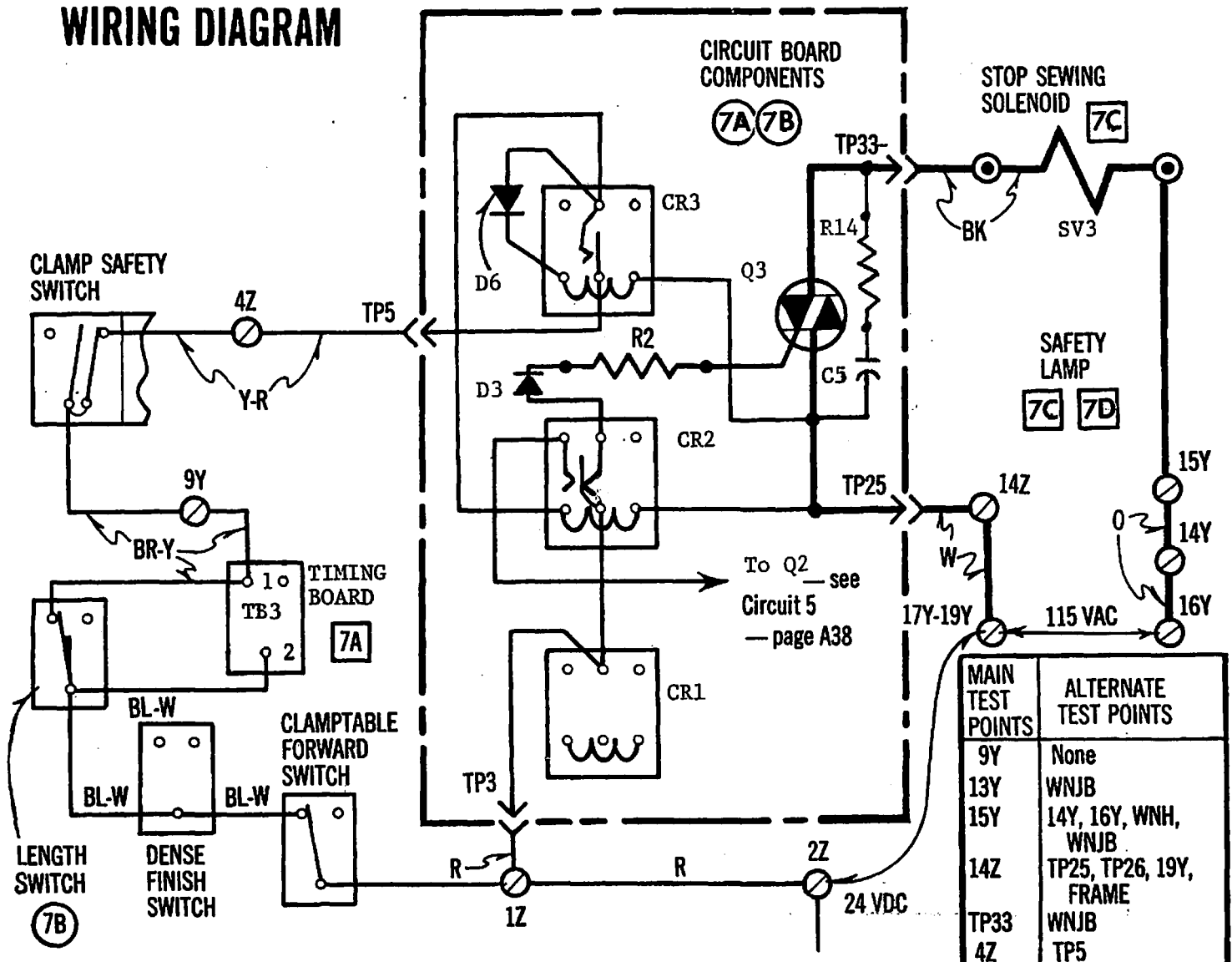
The stop sewing circuit operates in conjunction with the sew circuit. Whenever stop sewing solenoid is energized, the machine will not sew.

## GENERAL DESCRIPTION

The stop solenoid is energized when the 115 volt ac circuit is completed through triac Q3. Triac Q3 conducts 115 volts ac to complete the circuit when 24 volts dc is applied to its gate terminal, which takes place when the sew/stop relay (CR2) contacts are in the normal stop position (CR2 coil not energized).

The sew relay, CR3, contacts remain closed, and the sew circuit functions when 24 volts dc is received through clamp safety, Timing, and Clamp Table Forward Switches. When machine is sewing, a holding circuit is provided through the Length, Timing, and Clamp Safety switches, Sew Relay CR3, and Diode D6 to the coil of Relay CR2 to stop sewing. The Length switch opens one leg of the 24 volt dc circuit, and the timing switch controls the final stopping. When these switches are open, the sew relay contacts will open, reestablishing the stop relay condition in which the contacts are closed to conduct 24 volts dc to triac Q3 thereby energizing the stop solenoid.

## 7. STOP SEWING CIRCUIT WIRING DIAGRAM



# A46

## 7. STOP SEWING CIRCUIT TROUBLESHOOTING CHART

SYMPTOM	MACHINE CONDITIONS	TEST-REMEDY
Machine will not stop sewing	MAIN SWITCH ____ Pull to Start CLAMP TABLE ____ Back LOADING ____ MAN BACK SELECTOR ____ ELEC Knee control actuated (Energize sewing circuit by depressing knee control momentarily.)	<b>7A</b> Set the voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 9Y. The meter should read 24 volts dc. This circuit must be broken when Length switch is held open; then the voltmeter reading will drop to zero. If circuit is broken and start sewing solenoid is still energized, replace the main circuit board. If voltage stays at +24 volts dc, check prox. sensor and cam settings. If prox. and cam settings are correct, refer to timing adjustment section; replace timing P.C. board located behind main circuit board and below thread pick-up board.
Same as above	MAIN SWITCH ____ Pull to Start (Not sewing)	<b>7B</b> Set the voltmeter to the 150 volt ac scale. Connect the probes between 15Y and TP33. If a reading of 115 volts ac is obtained, the circuit board components are good. If not, replace the circuit board.
Same as above	MAIN SWITCH ____ Push to Stop	<b>7C</b> Set the meter to the X10 ohms scale. Connect the probes between 13Y and TP33. If a reading of approximately 30 ohms is obtained the stop sewing solenoid is good. If not, replace solenoid.
Same as above	Same as above	<b>7D</b> Check for continuity through bulb between 15Y and 13Y. Meter should read approximately 10 ohms. If not, replace with good bulb.

# 8. THREAD PICKUP CIRCUIT

A47

## GENERAL DESCRIPTION

The function of the thread pickup circuit is to operate the thread pickup fingers when sewing stops but before the thread is trimmed. The thread pickup switch is momentarily actuated by overthrow of the clutch dog stop motion as soon as the stop solenoid is energized. When the pickup fingers operate, they pick up the ends of thread after each sewing cycle in readiness for the next sewing cycle.

The thread pickup sensor triggers a timer on the prox. thread pickup board. Adjusting R105 (see below) on the board clockwise will increase the length of time the thread pickup fingers will stay down. Adjustment counterclockwise will decrease the amount of time. This P.C. board, through relay CRC, will send the table towards the rear during thread pickup finger extension.

If a problem with the thread pickup operation is encountered, observe the sequence of operation and determine the area of probable cause using the troubleshooting chart below.

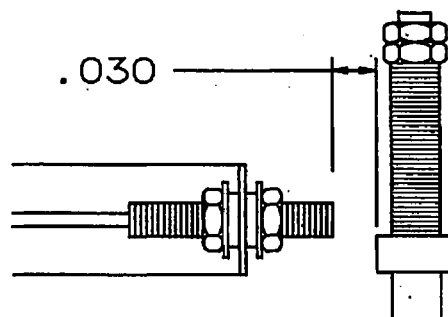
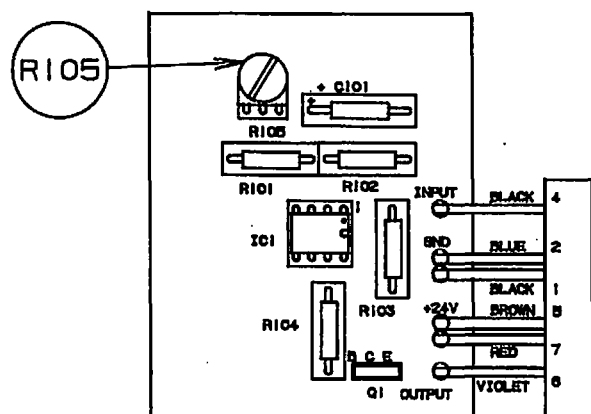
## CIRCUIT DESCRIPTION

The thread pickup solenoid is energized by 115 volts ac when its circuit is completed through triac Q1. Triac Q1 conducts the 115 volts ac when 24 volts dc is applied to its gate terminal. The table back solenoid is energized by 115 volts ac when its circuit is completed through relay CRC to ground. This sends the table back during thread pickup finger extension.

## THREAD PICKUP TROUBLESHOOTING CHART

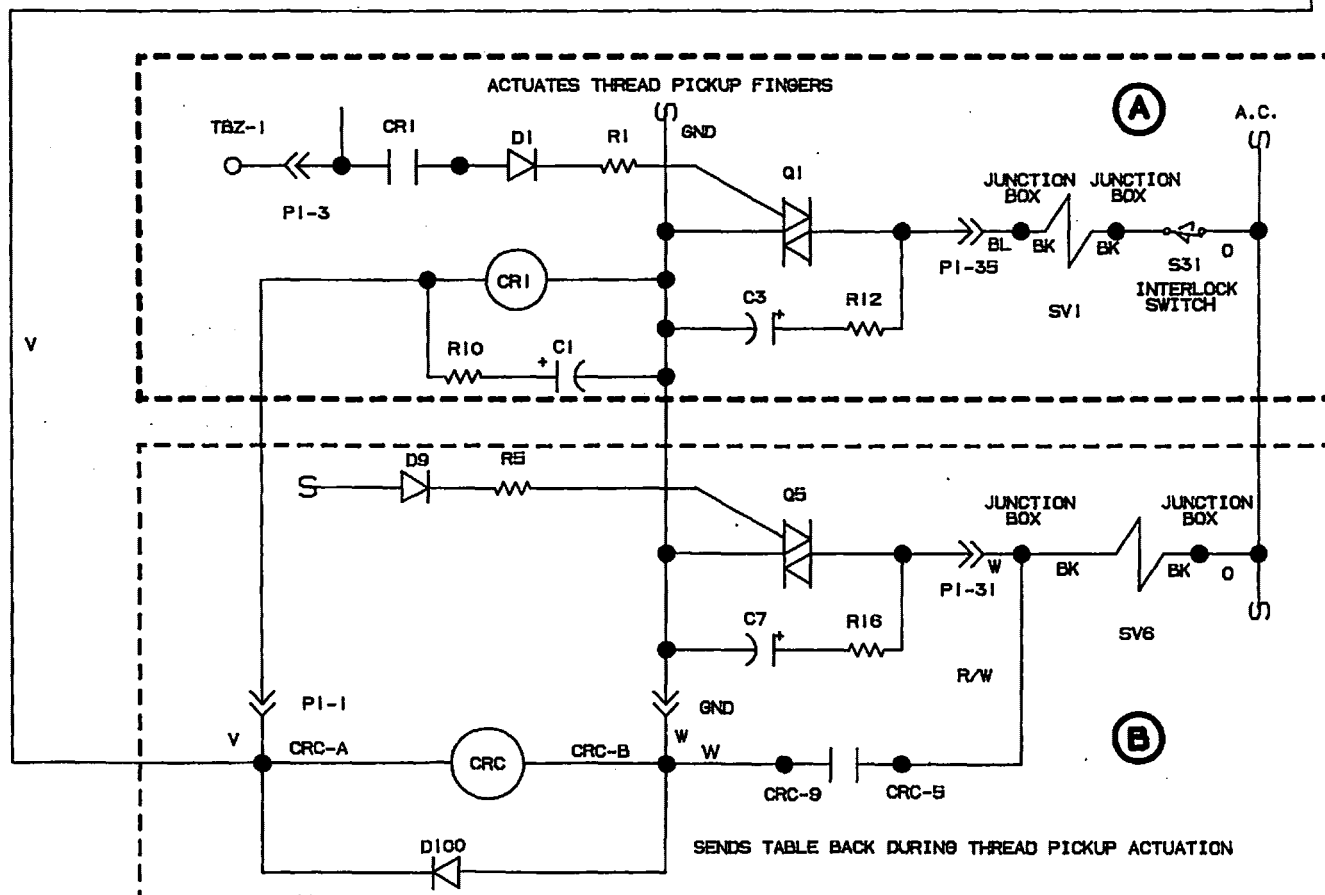
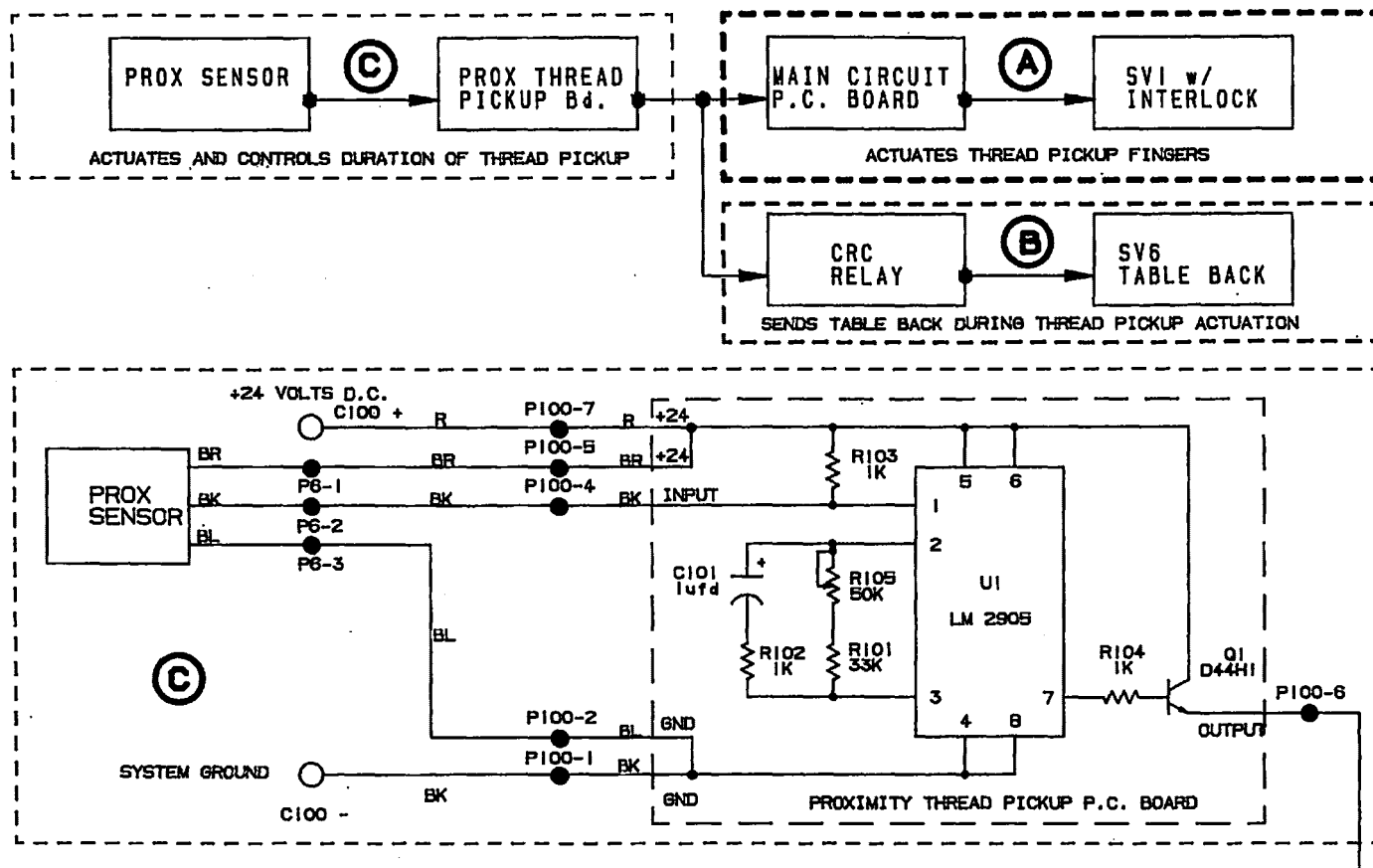
SYMPTOM	AREA OF PROBABLE CAUSE *
1. Thread pickup does not fire, Table goes back.	(A) 1. Main circuit board or connector. 2. SV1 w/ Interlock. 3. Related wiring.
2. Table does not go back, Thread pickup fires OK.	(B) 1. CRC relay or socket. 2. SV6. 3. Related wiring.
3. Thread pickup does not fire, Table does not go back.	(C) 1. Proximity sensor. 2. Prox thread pickup board. 3. Related wiring.

\* REFER TO THREAD PICKUP OPERATION DIAGRAM - NEXT PAGE



# A48

## 8. THREAD PICKUP CIRCUIT - WIRING DIAGRAM



## GENERAL DESCRIPTION

The knife fingers rise through the center cut in the material, cutting tabs at the ends of the sewn pocket. The fingers can be actuated to move up in three ways:

- (1) Semi-automatically, when the knee control is pressed, the fingers will rise and return to the down position.
- (2) Automatically, at the end of a sew cycle, the fingers will rise and return to the down position.
- (3) By turning the control panel FINGERS switch to the UP position. The fingers will rise.

If it is desired to raise the fingers to change the blades, this can be done by setting the control panel FINGERS switch to UP. They can be lowered again by turning the front panel FINGERS switch back to SEMI or AUTO.

## CIRCUIT DESCRIPTION

The knife fingers solenoid is energized when the 115 volt ac circuit is completed through triac Q6. The triac conducts the 115 volts ac when 24 volts dc is applied to its gate terminal.

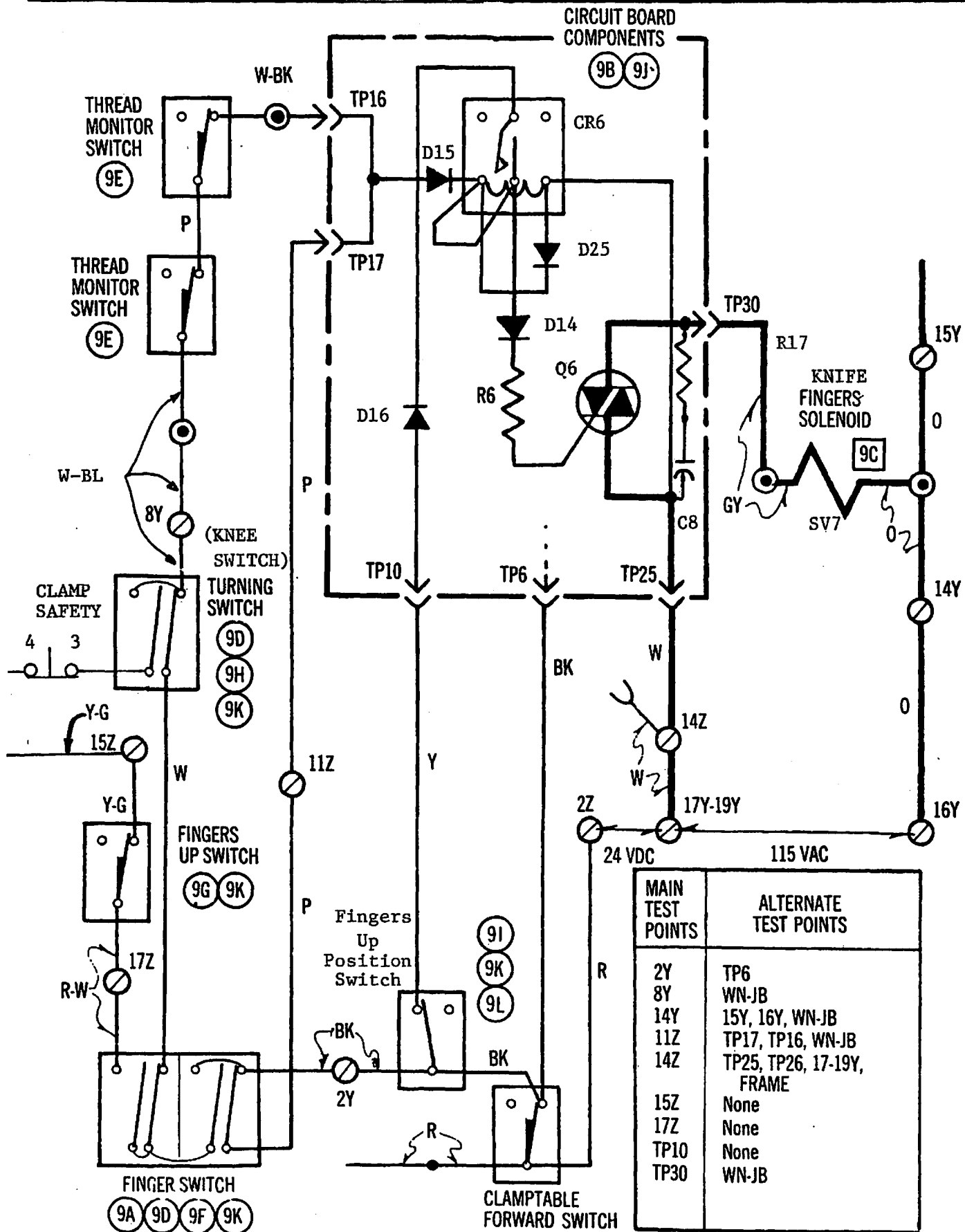
When the knife fingers are raised by setting the front panel FINGERS switch to AUTO, the voltage is available through the same path as in the SEMI position. The knife fingers will raise automatically when the Fingers Up switch is actuated.

When the Fingers Up switch is actuated, the knife fingers will stay in the raised position through means of a holding circuit provided through the Fingers Down switch.

When the contacts of relay CR6 are closed, a holding circuit is provided to the coil of relay CR6 through the Fingers Down switch.

When the knife fingers are raised by setting the front panel FINGERS switch to the UP position, the 24 volts dc is applied directly to the triac and the coil of the fingers up relay (CR6) through the Clamp Table Forward switch, if the table is in the forward position.

When the knife fingers are raised by setting the front panel FINGERS switch to the SEMI position, with the clamp table all the way forward, 24 voltage is applied to triac Q6 through the Clamp Table Forward, FINGERS, Turning and the Thread Monitor switches to relay CR6.





SYMPTOM	MACHINE CONDITIONS	TEST-REMEDY
Knife fingers will not raise in FINGERS UP position.	MAIN SWITCH _____ Pull to Start SELECTOR _____ P & E CLAMP TABLE _____ Forward FINGERS _____ UP	9A Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 11Z. If a 24 volt dc reading is obtained, the FINGERS switch is good in the UP position. If not, replace switch.
Same as above	Same as above	9B Set voltmeter to the 150 volt ac scale. Connect the probes to 16Y and TP30. If a reading of 115 volts ac is obtained, the circuit board components are good. If not, replace circuit board.
Same as above	MAIN SWITCH _____ Push to Stop	9C Set the meter to the X10 ohms scale. Connect the probes to 14Y and TP30. If a reading of approximately 80 ohms is obtained, the fingers solenoid is good. If not, replace solenoid.
Knife Fingers will not rise in FINGERS SEMI position.	MAIN SWITCH _____ Pull to Start SELECTOR _____ P & E CLAMP TABLE _____ Forward FINGERS _____ SEMI <u>Press Knee control</u>	9D Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 8Y. If a reading of 24 volts dc is obtained, the FINGERS switch is good in the SEMI position, and the knife switch (Knee) contacts are good. If no reading is obtained, check each switch and replace the faulty one.
Same as above	Same as above, also: <u>Close thread monitor switches</u>	9E Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 11Z. If a 24 volt dc reading is obtained, the Thread Monitor switches are good. If not, replace faulty switch.  Repeat steps 9A , 9B and 9C
Knife fingers will not rise automatically in FINGERS AUTO position.	MAIN SWITCH _____ Pull to Start SELECTOR _____ P & E FINGERS _____ AUTO	9F Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 17Z. If a reading of 24 volts dc is obtained, the FINGERS switch is good in the AUTO position.

SYMPTOM	MACHINE CONDITIONS	TEST-REMEDY
Same as above	Same as above, also: <u>Close Fingers Up switch</u>	(9G) Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 15Z. If a reading of 24 volts dc is obtained, the Fingers Up switch is good. If not, replace switch.  NOTE: Table Forward switch must close while Fingers Up switch is actuated. See Switch Adjustments.
Same as above	Same as above	(9H) Set voltmeter to the 50 volt ac scale. Connect the negative probe to ground or 14Z and the positive probe to 8Y. If a reading of 24 volts dc is obtained, the Knee (Knife) Switch is good. If not, replace switch.  Repeat steps (9A), (9B), (9C) and (9E)
Knife Fingers start to go up, but will not go up all the way.	MAIN SWITCH ____ Pull to Start SELECTOR ____ P & E FINGERS ____ SEMI Depress Knee switch momentarily.	(9I) Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to TP10. If a reading of 24 volts dc is obtained, the Fingers Down switch is good. If not, replace switch.
Same as above	Same as above	(9J) Set voltmeter to the 150 volt ac scale. Connect the probes to 14Y and TP30. If a reading of 115 volts ac is obtained, the circuit board components are good. If not, replace circuit board.
Knife Fingers will not go down.	MAIN SWITCH ____ Pull to Start SELECTOR ____ P & E CLAMP TABLE ____ Forward Fingers raised by malfunction.	(9K) Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 11Z. If a reading of 24 volts dc is obtained, check the Fingers Down switch, the FINGERS (panel) switch in the UP position, the Fingers Up switch, and the Knee (Knife) Switch. Replace faulty switch.
Knife fingers vibrate in UP position.	Malfunction	(9L) Check for short in Knife Fingers circuit in area of Fingers Down switch.

## GENERAL DESCRIPTION

The unloader circuit operates in conjunction with the Automatic Clamp up control circuit. When the clamp raises automatically, the auto clamp up relay (CR7) remains energized, holding the clamp up and supplying 24 volts dc to actuate the air jet nozzle of the unloading circuit. There are two identical circuits which operate simultaneously for a controlled length of time. One air jet nozzle is mounted on the machine top surface to the right of the clamp table and blows the completed material out to the left. The other air jet nozzle is mounted above material holder and blows the completed material down to a hanging position.

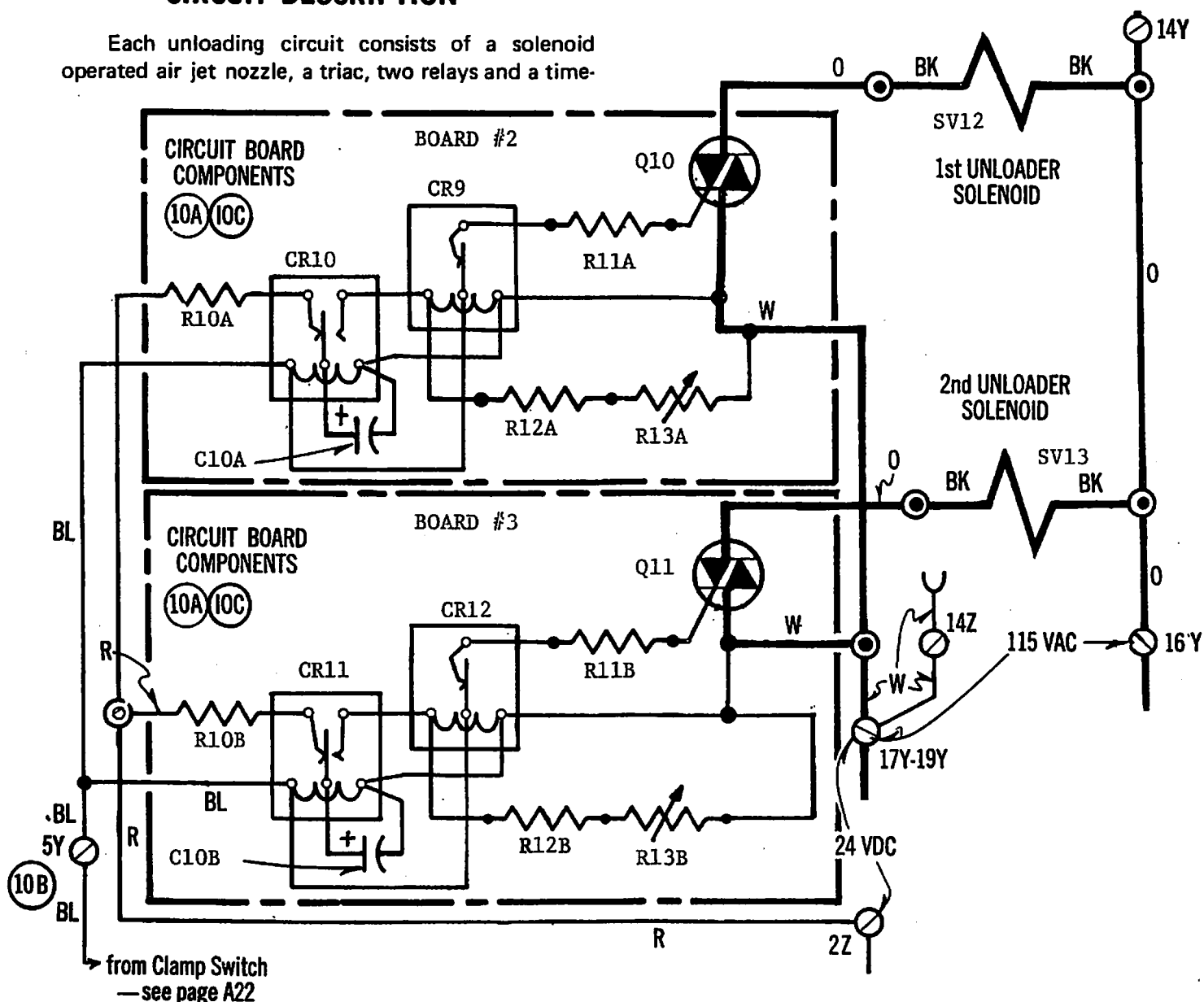
constant controlled capacitor which supplies the voltage to energize the holding relay for the correct duration of time. The unloader operates whenever the clamp table is in the forward position and the clamp arms are raised automatically.

Twenty-four volts dc is available through the contacts of relay CR7 and the Auto Clamp Up switch to Unloader triac Q10, through the control components on the unloader circuit board.

The length of time the air solenoid is energized is varied through the potentiometer. Normal adjustment is to have as short a blast as possible on the right hand nozzle and a slightly longer blast on left hand nozzle.

## CIRCUIT DESCRIPTION

Each unloading circuit consists of a solenoid operated air jet nozzle, a triac, two relays and a time-



# A54

## 10. UNLOADER CIRCUIT TROUBLESHOOTING CHART

SYMPTOM	MACHINE CONDITIONS	TEST-REMEDY
No air blast for material removal	MAIN SWITCH _____ Pull to Start SELECTOR _____ P & E CLAMP TABLE _____ Back CLAMP _____ Up	(10A) Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 2Z. If a 24 volt dc reading is obtained, power supply is good and voltage is available to the unloader circuit charging capacitor.
Same as above	Send knifefingers up and down. This will operate clamp up.	(10B) Set voltmeter to the 50 volt dc scale. Connect the negative probe to ground or 14Z and the positive probe to 5Y. If a 24 volt dc reading is not obtained, see Clamp Circuit ①.
Same as above	Same as above	(10C) Set voltmeter to the 150 volt ac scale. Disconnect the orange (O) wire from the unloader circuit board to the solenoid valves. Connect the leads between 16Y and the orange (O) wire from the board and check for 115 volts ac when the clamp goes up. If voltage is present and no air blast, replace solenoid valve. If no voltage is present, replace unloader circuit board.  If air does not turn off, replace unloader circuit board.

# 11. CENTER KNIFE UP/DOWN

A55

## GENERAL DESCRIPTION

When the center knife 3-position switch (S33) is in the 'normal' position, the center knife will operate normally during the center dense portion of the sew cycle. The center knife can also be held in the 'up' or 'down' position by selecting these settings manually with the switch.

## CIRCUIT DESCRIPTION

During 'normal' operation, the center knife is activated up into the cutting area when +24V dc is supplied to solenoid SV11. The 24 volts for this function is provided through the clutch dog switch (S16) and the knife up switch (S32). The center knife will be deactivated back down out of the cutting area when +24V dc is supplied to solenoid SV10 through switch S12 at the beginning of dense finish sewing. In this position, the center knife switch is essentially not in the circuit.

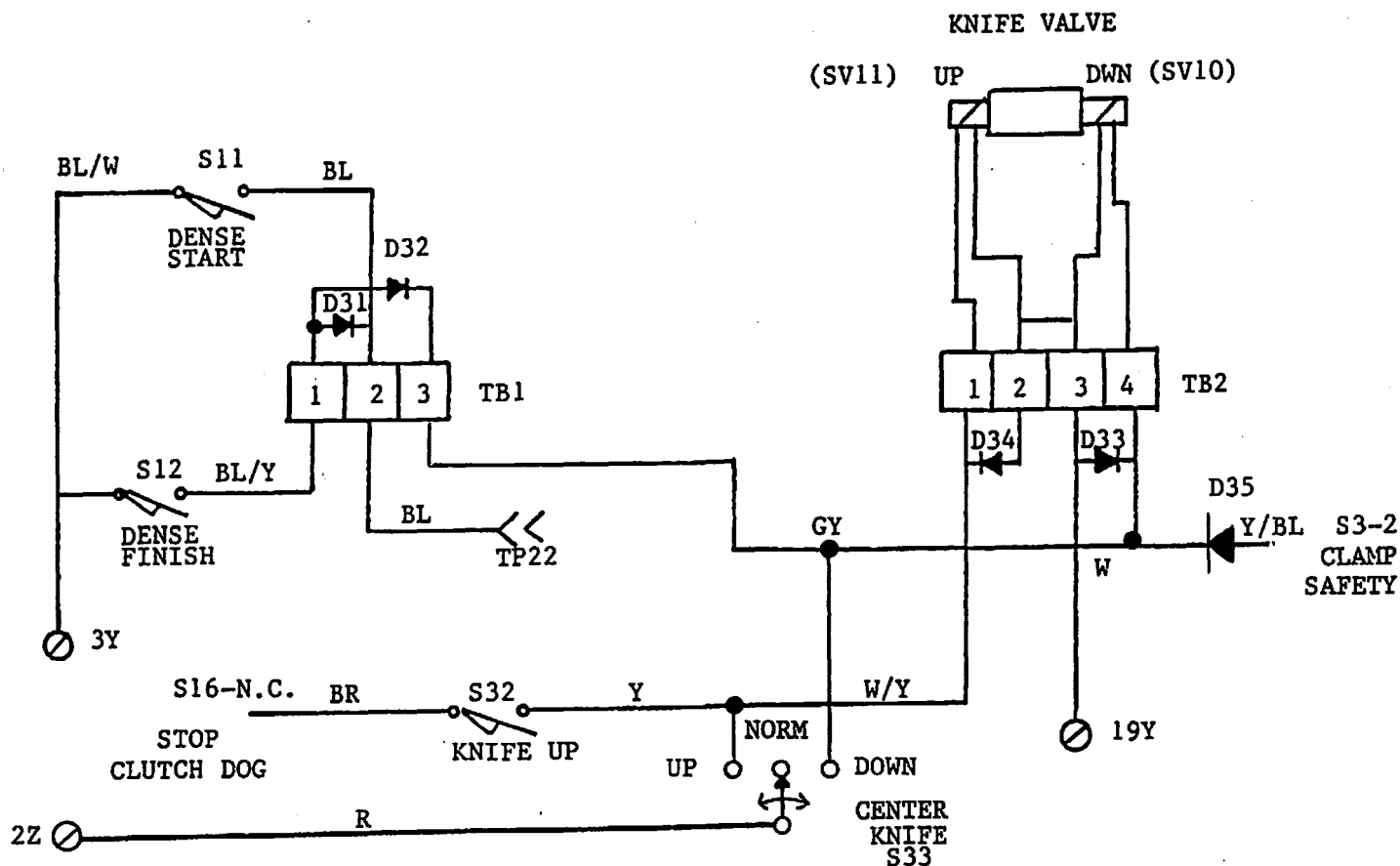
Shifting Center Knife Up - Into Cutting Area:

The 24 volts is supplied directly through the center knife switch to the knife up solenoid (SV11) when the 'up' function is selected.

Shifting Center Knife Down - Out Of Cutting Area:

The 24 volts is supplied directly through the center knife switch to the knife down solenoid (SV10) when the 'down' function is selected.

NOTE: Set air regulator at 50 PSI; also there are two potentiometers on the solenoid valve; if adjustment is made to either one, keep the centerknife action set so that it will come up and down softly. If set to come down hard, it may cause the end dense to disappear.

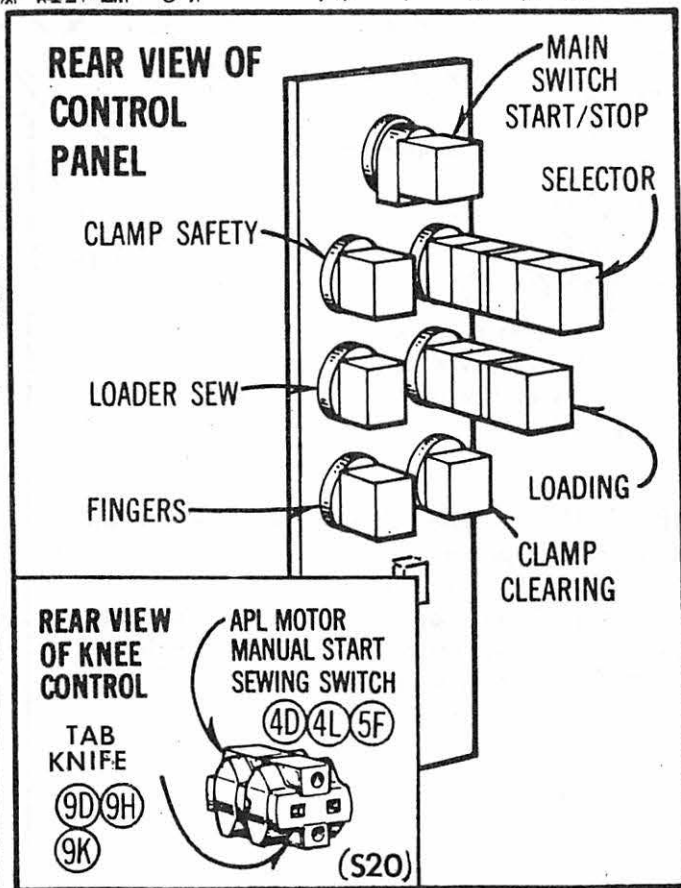
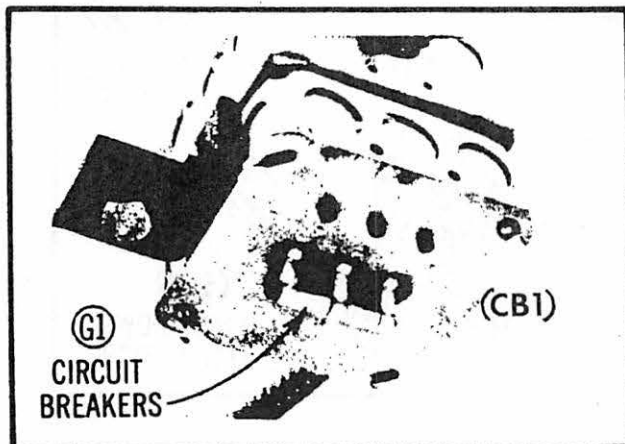
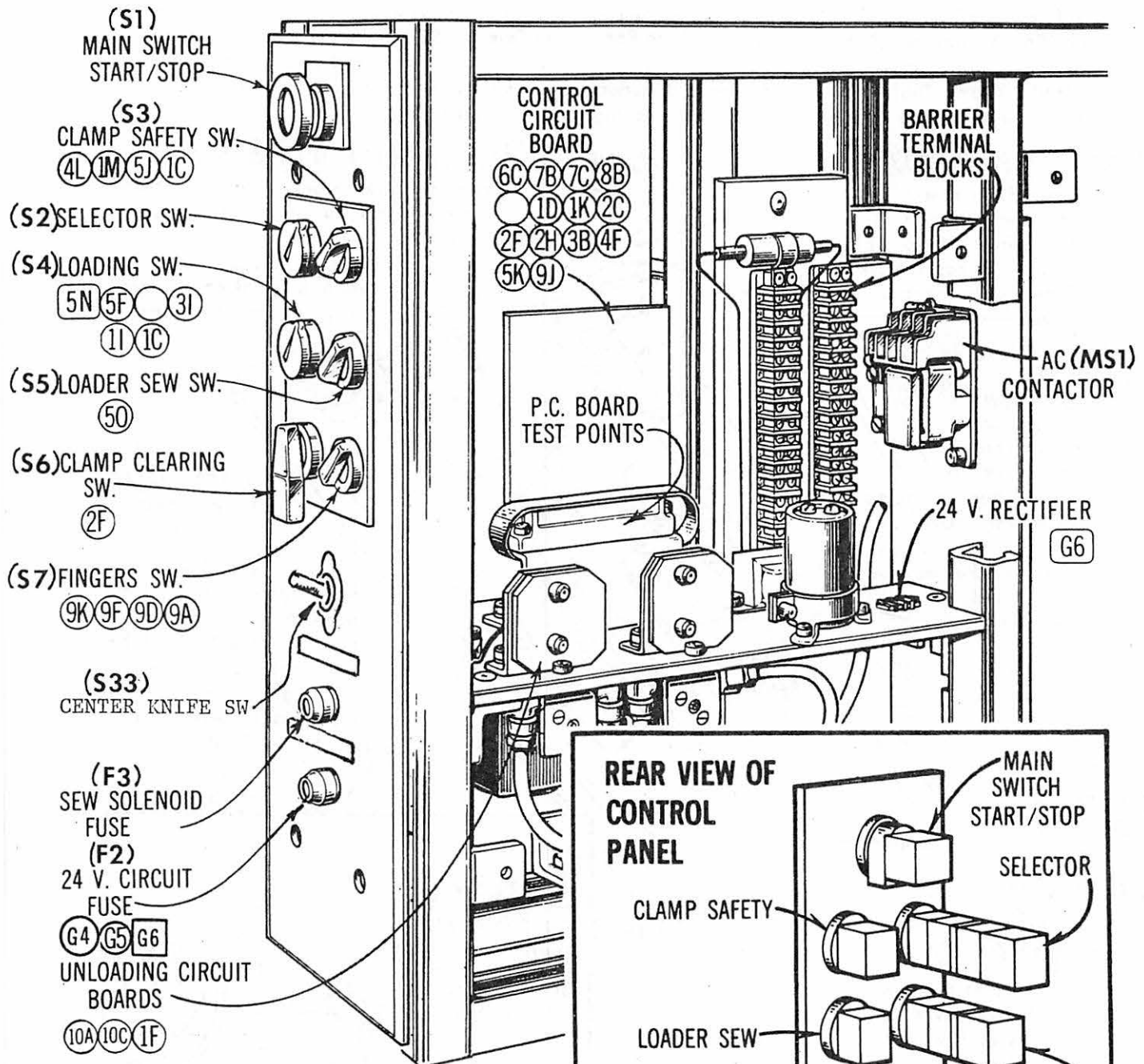


# A56

# NOTES

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# A58 ELECTRICAL COMPONENTS - SETTINGS AND ADJUSTMENTS

Before adjusting switches, pull Main (Stop/Start) Switch out and send Clamp Table to its back position by turning Clamp Clearing Switch to Back. Set Selector Switch to "Elec.". Energize Sewing cycle by pressing Knee Control. This will eliminate clamp table feed pressure and permit the Clamp Table to be moved forward manually. It will also enable switches to actuate their corresponding solenoids to simplify checking switch adjustments.

## (S19) FINGERS UP SW. (9L)(9G)(9K)

Forward movement of actuator (A) must click this switch after or while bracket (B) has actuated Clamp Table Forward Switch.

## (S13)

## CLAMP TABLE FORWARD SWITCH (1H)(3A)(3H)(5H)(6A)

Forward movement of roller bracket (B) must click switch before the Fingers Up switch is actuated. Bend switch lever as required.

**IMPORTANT:** Fingers will not operate automatically unless this adjustment is correct.

## (S11) DENSE START SW (6F)(6B)

## (S24) APL MOTOR AUTO START SW. (5E)(4D)

Set switch arm high on bracket so that switch clicks when contacted by forward movement of roller bracket (C). Both switches must be set to click at same time.

## (S32) CENTER KNIFE UP SW

(1L)

## (S23) AUTOMATIC CLAMP UP SWITCH

## (S17) FINGERS DOWN SAFETY SWITCH

(4A)(3D)(2A)(1A)(5B)

Set switches to click just before lever (E) reaches bottom of its stroke.

## (S15) LENGTH SAFETY SWITCH

Position switch to click when contacted by forward movement of actuator (D). A minimum of 3/8" must be maintained between the center line of the Length Switch roll and the Length Safety Switch roll. **CENTER KNIFE DOWN DENSE FINISH - LENGTH SWITCHES** See facing page (S12), (S9)

## (S21) FINGERS DOWN SWITCH

Set this switch to click just before (F) reach top of slots in cam plate

## AUTOMATIC (S23) CLAMP UP SWITCH

(S17)

## FINGERS DOWN SAFETY SWITCH

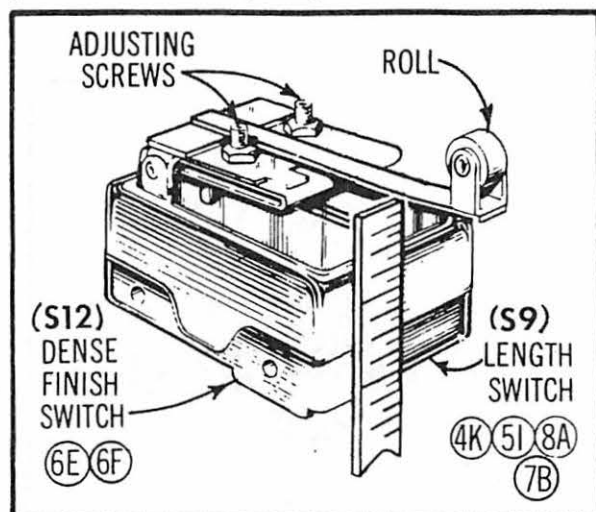
**IMPORTANT:** Switches click twice -- once when the lever is depressed and again when the lever is released. The click points can be heard at close range or may be felt by placing a finger lightly on the fulcrum point of the switch lever.

**NOTE:** All adjustments refer to the first click of the switch.

## DENSE FINISH &amp; LENGTH SWITCH

**"OFF THE MACHINE" ADJUSTMENTS** — Holding a scale against front of switch unit, check the click points of both switches as follows:

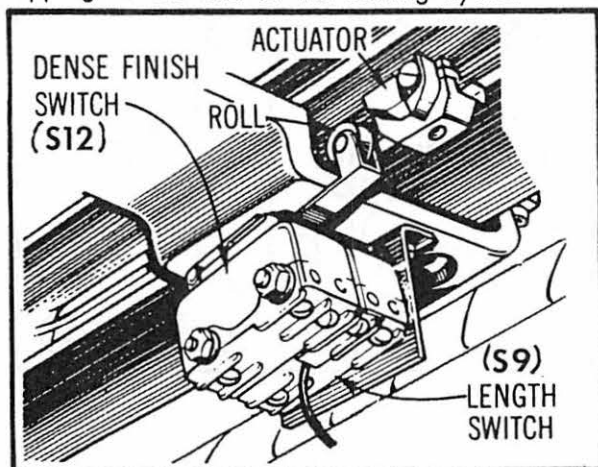
When switch unit lever is depressed  $1/16"$  the Dense Finish switch must click. When lever is further depressed an additional  $3/32"$ , the Length switch must click. This unit is pre-set for this timing, but if realignment is necessary, do so by means of the adjusting screws.



**"ON THE MACHINE" ADJUSTMENTS** — Install the switch unit on machine to the following settings:

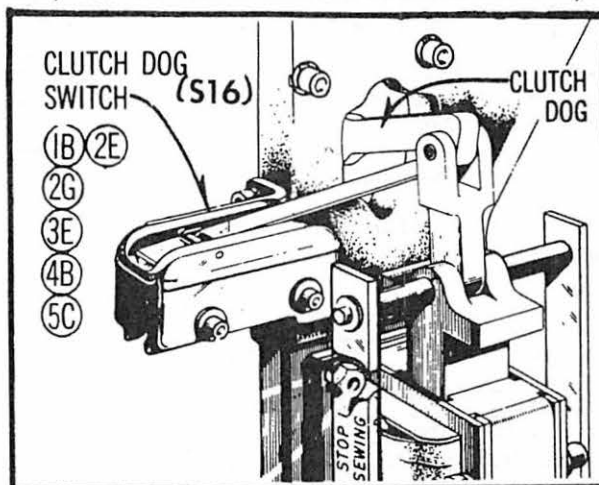
It must be high enough on its bracket so that the forward movement of actuator clicks both switches, and the roll remains in contact with the actuator as long as possible. See Thread Pickup switch adjustment.

Do not set too high or the clamp circuit will be broken when the clamp table travels back to "start sewing" position, causing the clamp to fall momentarily. When adjustment is correct, there will be five or six dense stitches before stopping at the end of the sewing cycle.



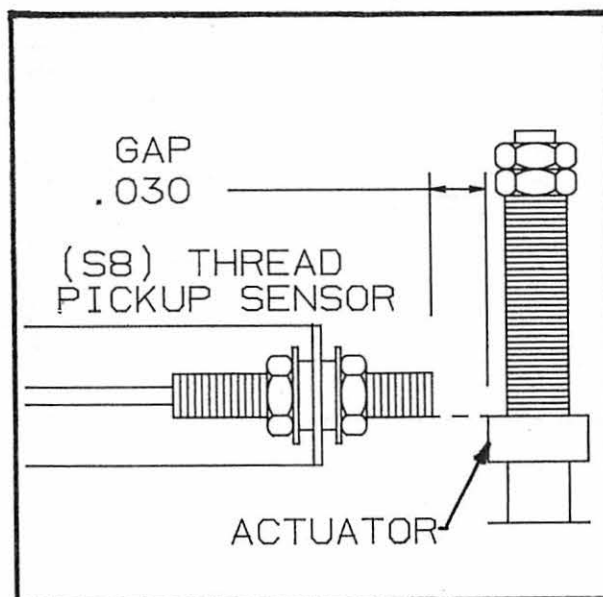
## CLUTCH DOG SWITCH

Set switch to click within  $1/8"$  movement of clutch dog. This adjustment can only be made when clamp table is in the rear position, stop motion is locked, and the clutch solenoid is raised manually.



## THREAD PICK-UP SENSOR

The overthrow of the stop motion is sufficient to momentarily actuate this sensor. The sensor will trigger the timing I.C. on the thread pick-up board when the actuator first passes in front of the sensor and then returns to its home position. To test the sensor, place a screwdriver in front of the sensor. The thread pick-up function will not operate until you remove the screwdriver from in front of the sensor. This removal of the steel actuator will cause thread pick-up to function. Adjust the gap between the face of the sensor and the side of the actuator to .030" (.050" max.). Make sure that the bottom of the sensor is level with the top of the actuator.



# A60 ELECTRICAL COMPONENTS - SETTINGS AND ADJUSTMENTS

## TIMING SWITCH

The clutch dog (bumper) must be 'triggered' at the correct moment to engage the clutch release dog without 'fly-over'. See Page A96, Clutch Dog (Bumper) Adjustment. Accurate adjustment of both timing sensor and cam is essential to stop the sewing at the correct time. Adjust proximity sensor height for proper clearance between the face of the sensor and the large diameter of the cam. The sensor should be centrally located with the width of the cam, not touching the cam at any point during cam rotation, and be no further away from the cam than .030" maximum.

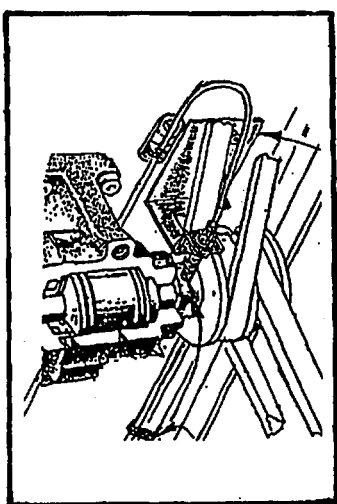
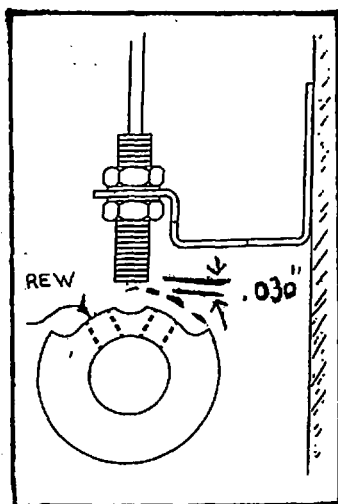
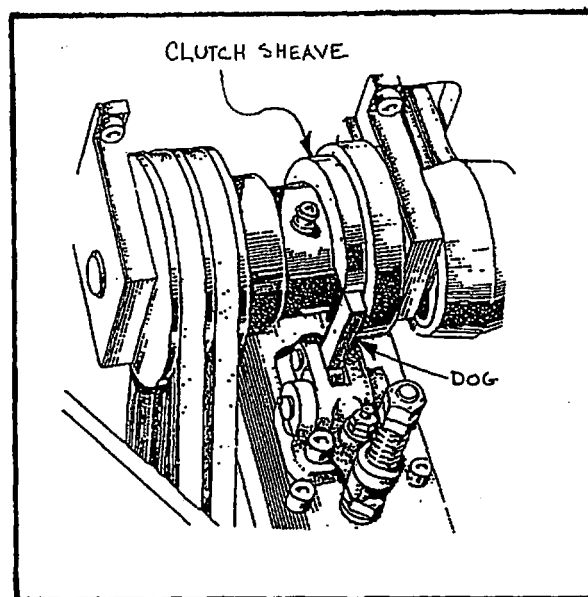
Before starting adjustment of cam, set the control panel in the following position:

Main	Pull to Start
Selector	P & E
Clamp Safety	Normal
Loading	Man. Front to Back
Loader	Any Position
Clamp Clearing	Center
Fingers	Any Position

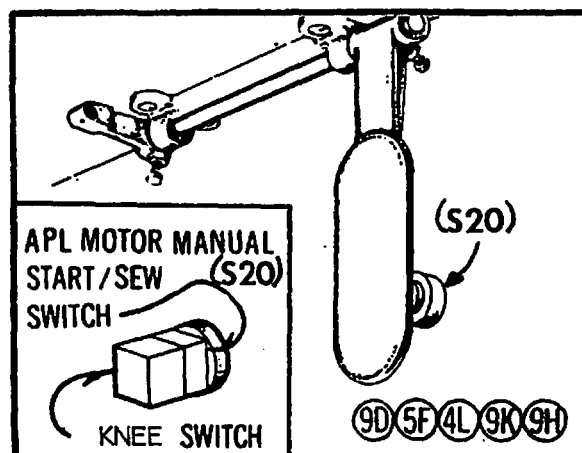
Press pedal to send clamp table to its back position (\* or by clamp clearing switch). Now, move selector switch from P & E position to elec. position and press knee control to release drive shaft. Turn the clamp safety switch to the repair position. Rotate the drive shaft until the leading edge of the clutch sheave is lined up with the top of the "dog". With the drive shaft in this position, rotate the timing cam until the alignment groove is located directly under the proximity sensor. Lock the cam in place with the front set screw. Rotate the drive shaft and lock down the second set screw of the timing cam.

**To Test Timing Cam Setting:** Return the clamp safety switch to the normal position. Actuate the knee switch. Rotate the drive shaft 90 degrees. Hold the length switch closed and rotate the drive shaft until the stop solenoid is energized. Verify that the "clutch release dog" has travelled past the top of the "dog".

**NOTE:** The cable coming out of the proximity sensor should not have a sharp bend or be pulled tight. A smooth arc is required for proper operation of the proximity sensor assembly.



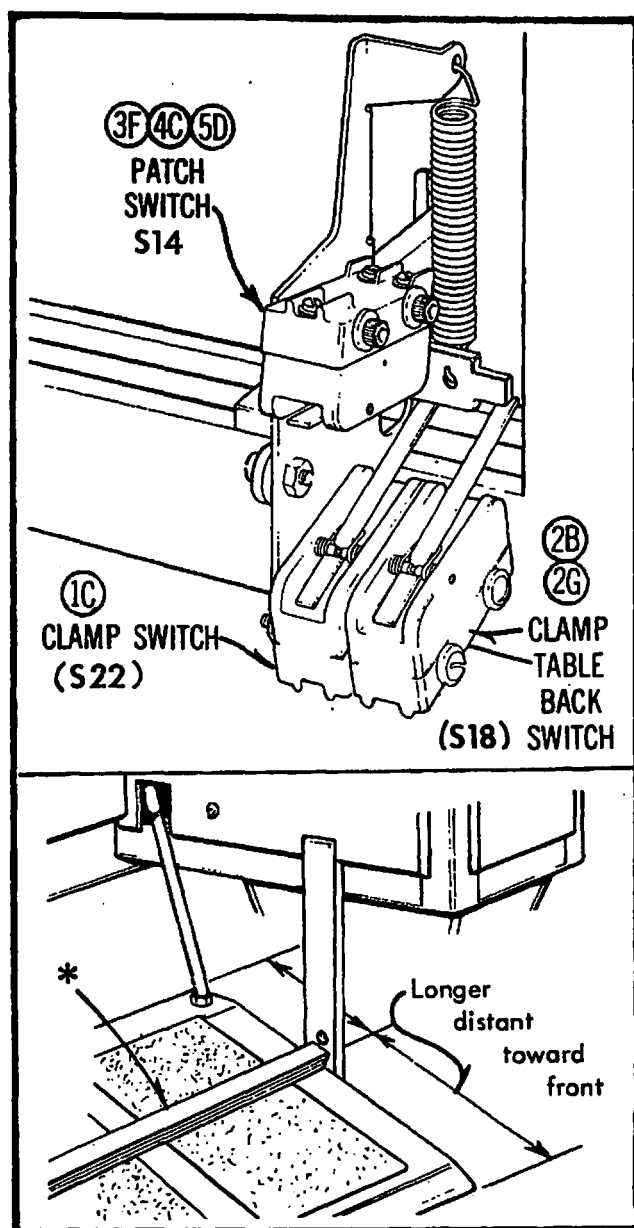
## KNEE CONTROL



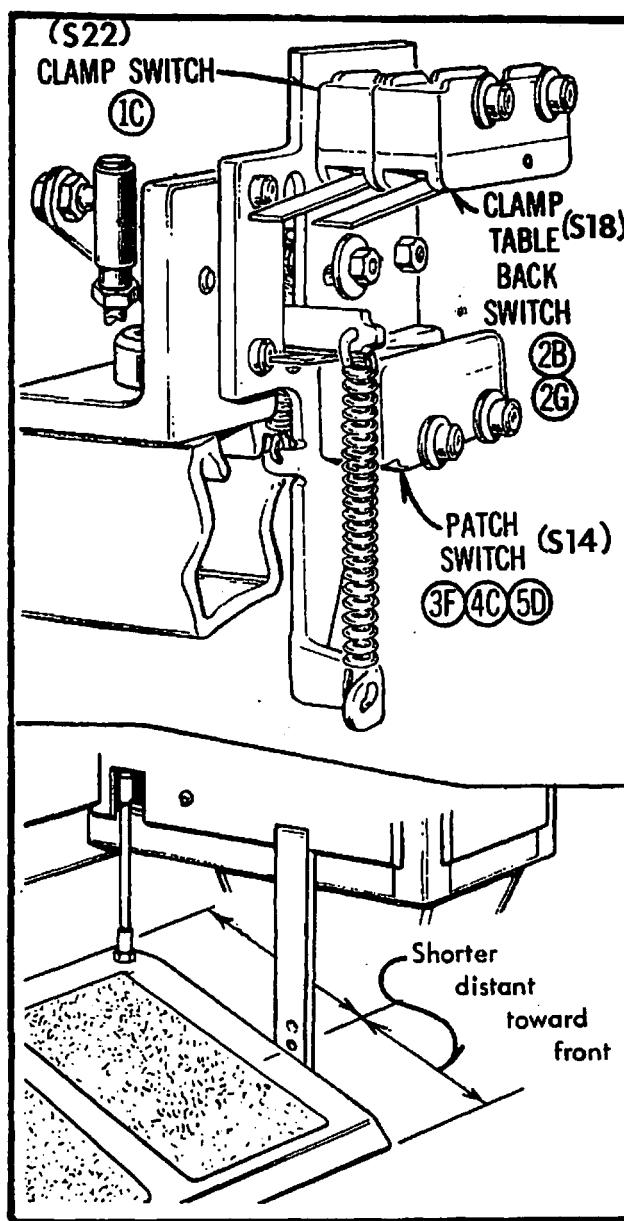


## PEDAL SWITCHES

## STANDING



## SITTING

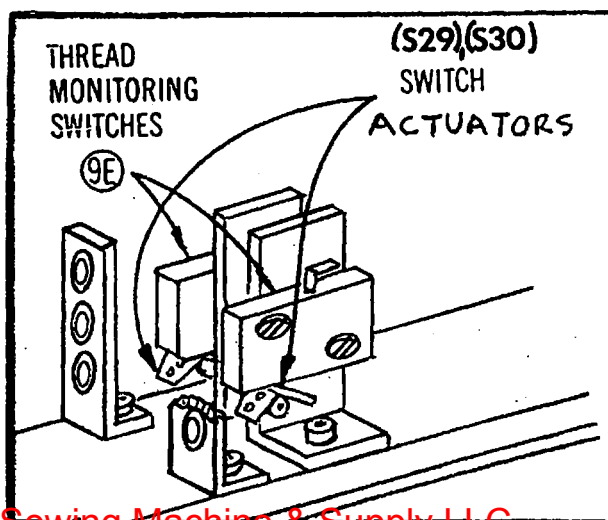


\* Footrest - Option on Sitting Models only

## THREAD MONITORING SWITCHES

These switches are wired in series across the knife fingers circuit. If thread breaks, the opening of either of these switches will keep the knife fingers from raising, thus allowing the operator to make repairs.

**TO ADJUST:** Set switches on bracket to assure activation when threads are taut at the end of the sewing cycle.

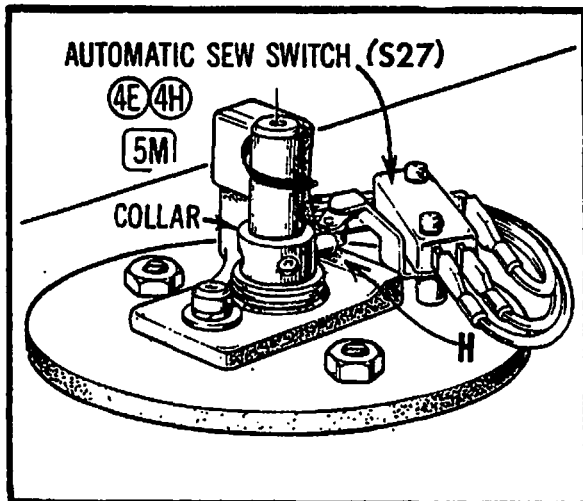


## AUTOMATIC SEW SWITCH

As the patch loader is returning to its rest position, after loading patches, screw (H) actuates Automatic Sew switch, which starts the sewing cycle. Settings must be so that switch clicks when patch loader arm is traveling in the direction of arrow, and patch tray is clear of patch folding mechanism.

**TO ADJUST:** Set patch loader arm to meet above conditions by loosening collar. Rotate and set collar to actuate Automatic Sew switch when patch loader arm is at above described position.

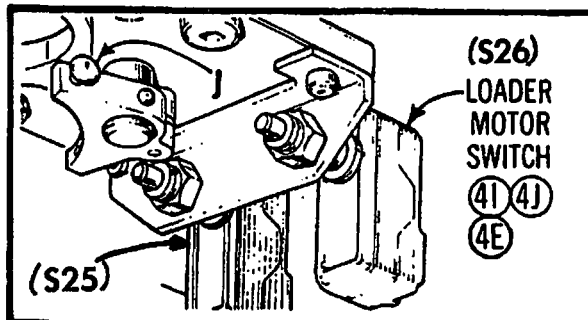
**CAUTION:** The Automatic Sew switch is set in a fixed position and is not adjustable.



## LOADER MOTOR SWITCH

When the patch loader arm returns to its rest position, screw (J) actuates the loader motor switch, which in turn stops the loader motor. In combination with the braking mechanism and this switch, the patch loader arm must come to a complete stop as soon as this switch is actuated.

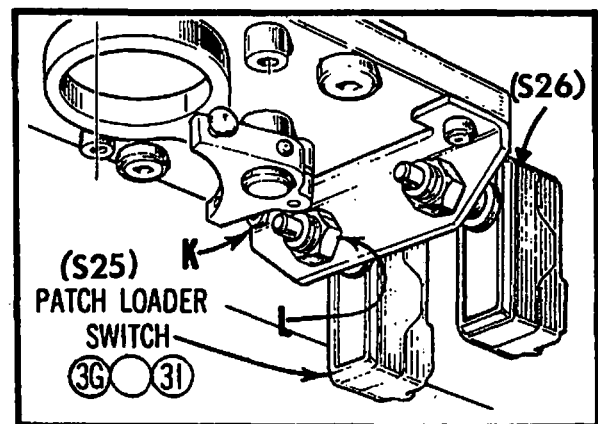
**TO ADJUST:** With patch loader arm in rest position, adjust screw (J) to click Loader Motor switch. After switch clicks, check that there is 1/16" additional travel of patch loader arm. This is to assure that the switch remains actuated in order to prevent the premature starting of the loader motor.



## PATCH LOADER SWITCH

When patch loader arm reaches loading position, screw (K) will actuate Patch Loader switch, causing the patch folding brushes to close. This switch has a strong internal spring which is very effective in preventing deflection when the patch loader arm contacts stop.

**TO ADJUST:** Position screw (K) so that it causes the Patch Loader switch to click when the patch tray is in loading position. **IMPORTANT:** Check that switch plunger has 1/64" additional travel after patch loader arm has reached its loading position. This added movement is necessary to prevent jamming plunger into body of switch. If necessary, loosen nut (L) and reposition the switch on bracket to obtain 1/64" movement.



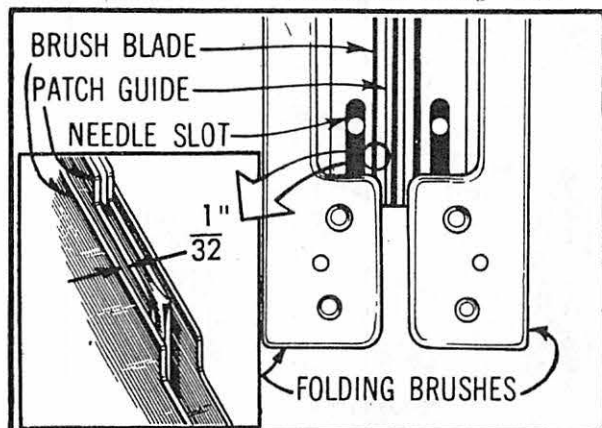
## PATCH FOLDING SAFETY SWITCH

This switch is connected in series with the Sew/Center Dense Circuit. It is actuated by the closing of the Folding Brushes when the Clamp Table is in or approaching its rear position. Its function is to prevent sewing from starting until the Brush Blades are between the needle slots and sides of the Patch Guide.

**TO ADJUST:** The following procedure is for obtaining the proper timing of switch actuation in relation to the position of the Brush Blades.

1. Operate Clamp Table to its back position allowing Clamp Arms to drop and Folding Brushes to remain open, while keeping Pedal depressed.
2. Stop flow of oil to Patch Folding Cylinder by turning Patch Folding metering screw (see page 61) until Brushes remain open when the Pedal is released.
3. Turn Patch Folding metering screw out, which will cause Folding Brushes to slowly close. Listen for actuation (click) of switch.

4. Click of switch must occur when Brush Blades are approximately  $\frac{1}{32}$  of an inch from the sides of the Patch Guide. This adjustment may vary slightly depending on the thickness of the material being used.

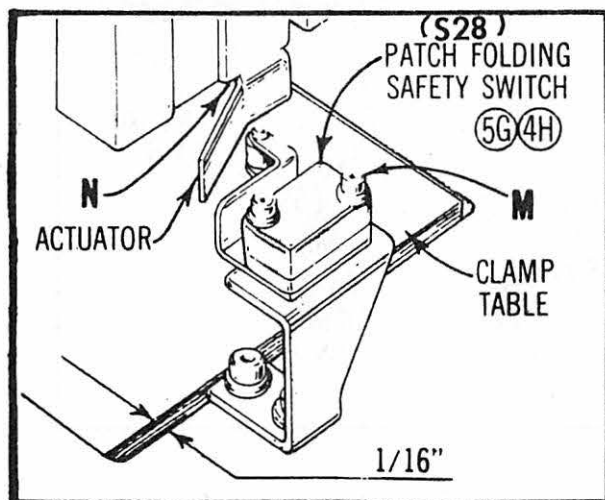


When making these adjustments or replacing a switch, the Pump and Motor must be turned OFF.

Proceed as follows:-

1. Send Clamp Table to its forward position.
2. Set Selector Switch to ELEC. position.
3. Turn Clamp Clearing Switch to BACK position. Clamp Table will not move because of position of Selector Switch but the Clamp Table Travel Solenoid will be energized permitting manual movement of the Clamp Table.
4. Manually close Folding Brushes.
5. Holding Folding Brushes close, manually move Clamp Table to rear position.
6. Switch should actuate (click) when Clamp Table is  $\frac{1}{16}$  of an inch from its extreme rear position.

**TO ADJUST:** Set switch position on Bracket by means of screws (M). Obtain back and forth setting of actuator by means of screw (N).



## PATCH LOADER MOTOR BRAKING

When making the following adjustments, set the Control Panel switches as follows:

Main . . . . .	Pull to Start
Selector. . . . .	P & E
Clamp Safety . . .	Repair
Loading. . . . .	Man. Front
Loader Sew. . . .	Off
Clamp Clearing . .	Center
Fingers . . . . .	Any Position

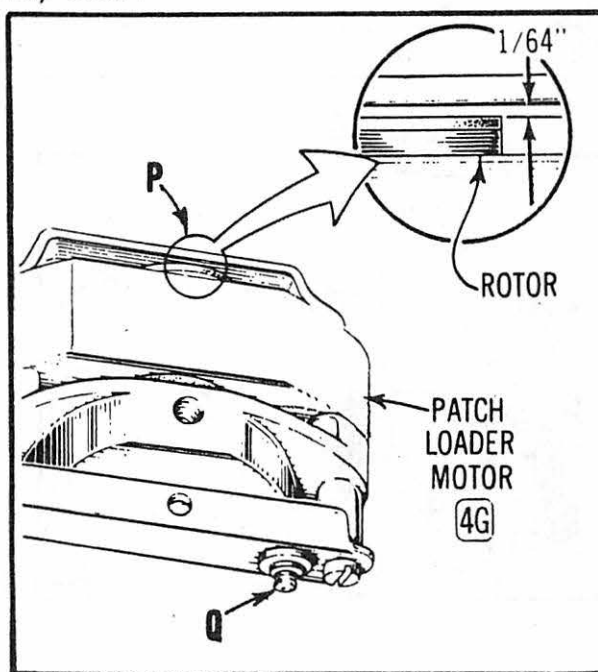
Braking is used to instantly stop the rotor as soon as the motor has been de-energized. This prevents overthrow of the Patch Loader Arm when reaching its rest position.

With Clamp Table all the way back, momentarily press Knee Switch. Release as soon as the Patch Loader Arm has travelled a short distance. If there is any overthrow or "gliding" of the Patch Loader Arm after the Knee Switch is released, adjust Patch Loader Motor Braking.

### TO ADJUST:

1. Remove oil cups and motor cover.
2. Press and release the Knee Switch while observing action of rotor at point (P).
3. If there is overthrow, turn the adjusting screw (Q) clockwise for more braking action. The downward movement of the rotor should be approximately  $\frac{1}{64}$  of an inch when the Patch Loader Motor is energized.

**CAUTION:** Excessive braking will cause the Patch Loader Motor to overheat and binding may occur.



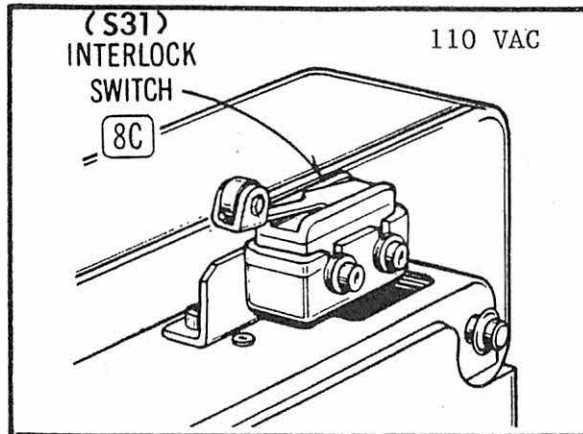


# A64 ELECTRICAL COMPONENTS - SETTINGS AND ADJUSTMENTS

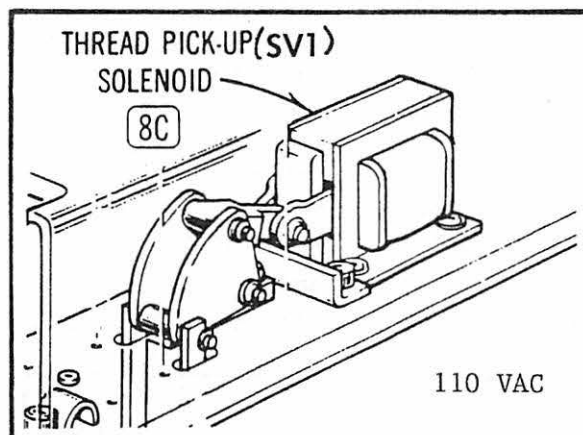
## INTERLOCK SWITCH

This switch is wired in series with Thread Pick-up Circuit. Its purpose is to prevent the actuation of the Thread Pick-up Solenoid if the machine head cover is not completely closed.

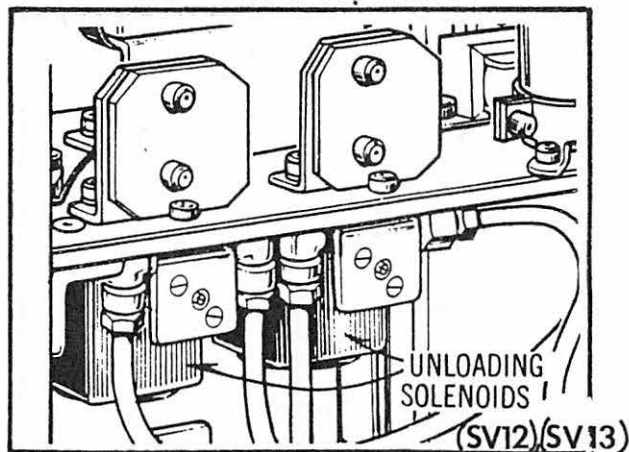
TO ADJUST: Switch should be set on its bracket to "click" open as soon as machine head cover is raised.



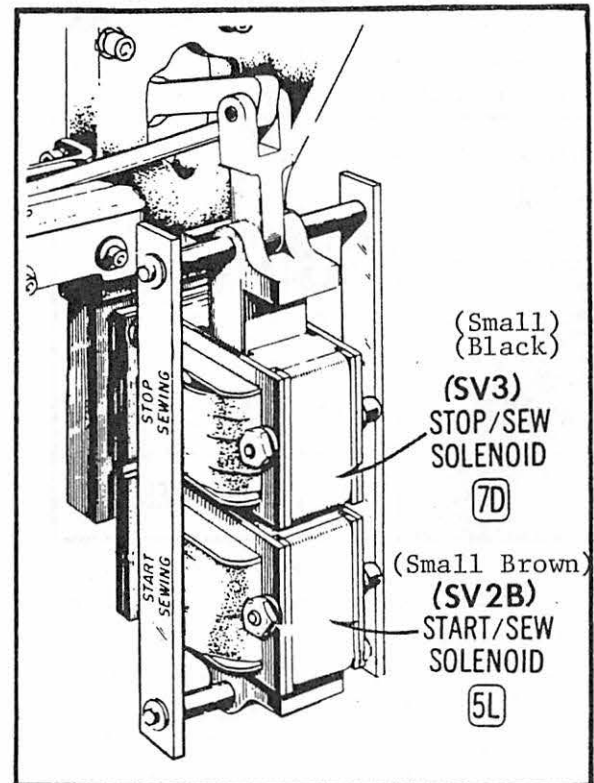
## THREAD PICK-UP SOLENOID



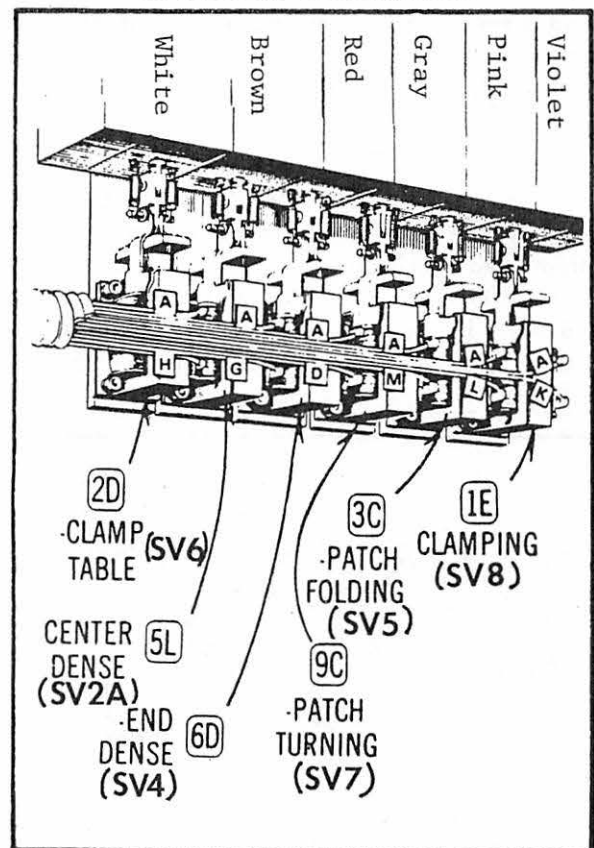
## UNLOADING SOLENOIDS



## STOP/START SOLENOID



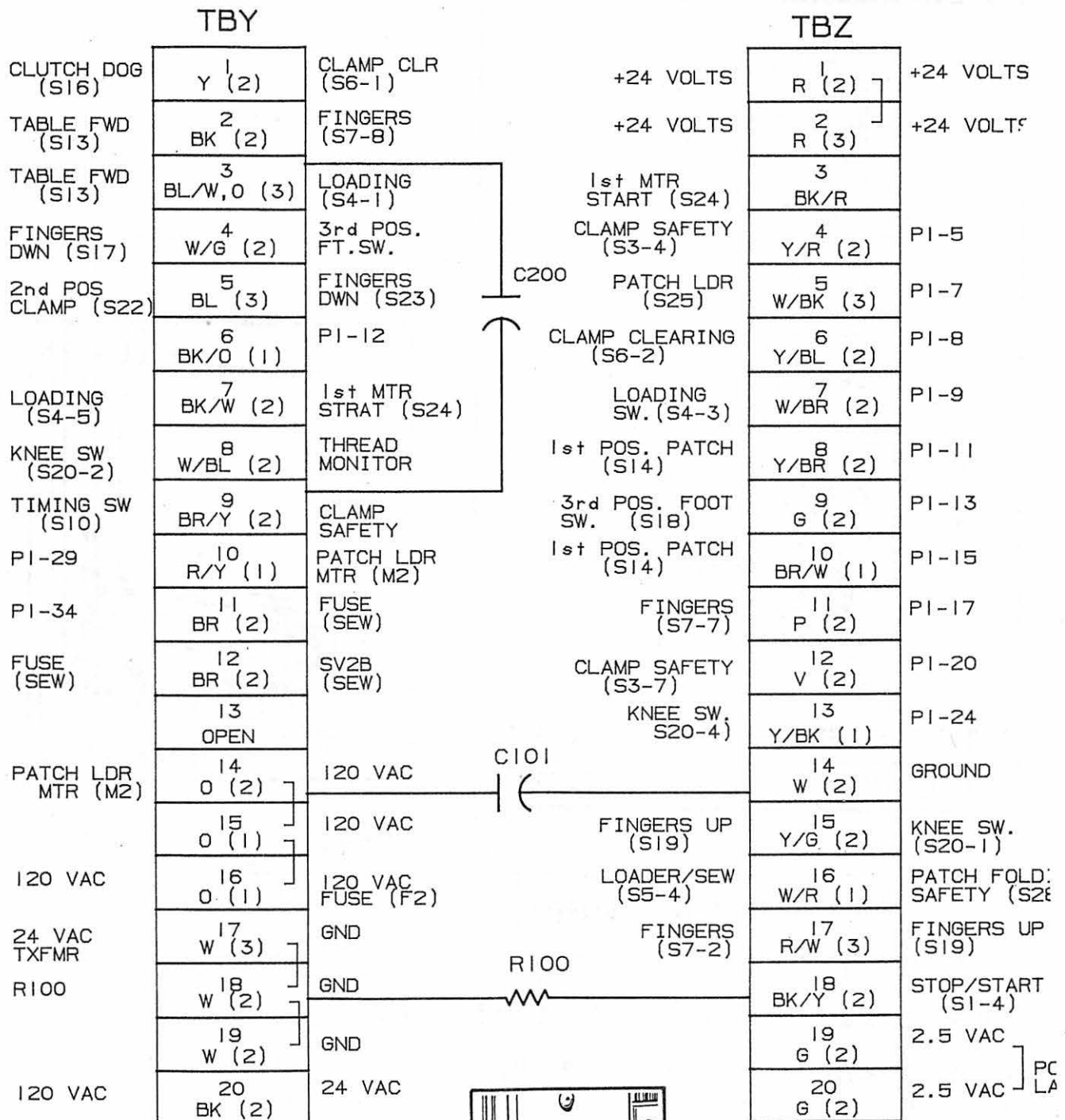
## MANIFOLD SOLENOIDS





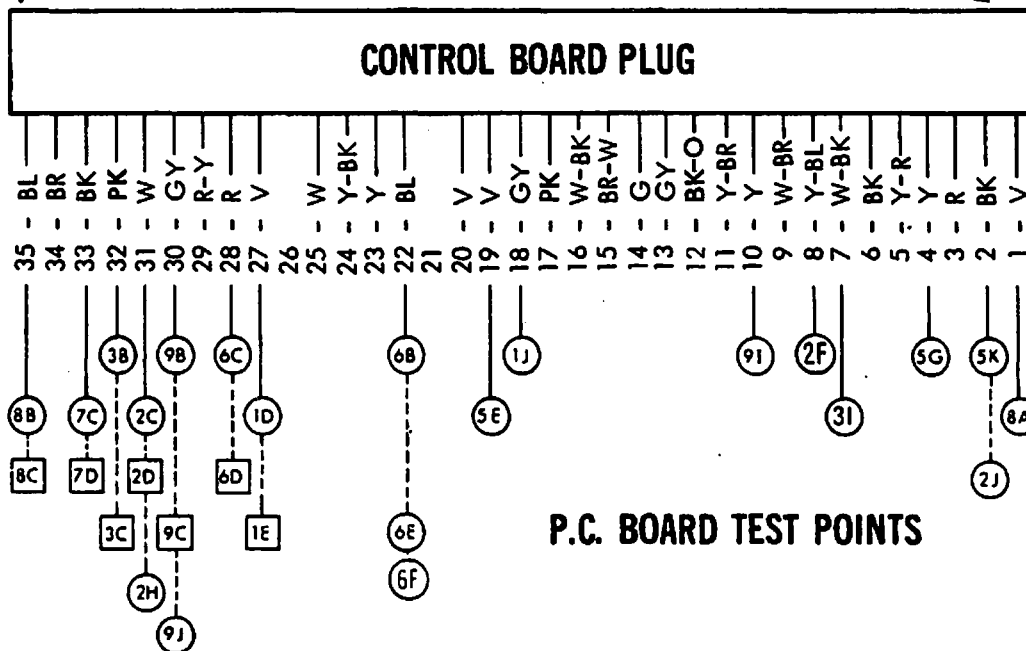
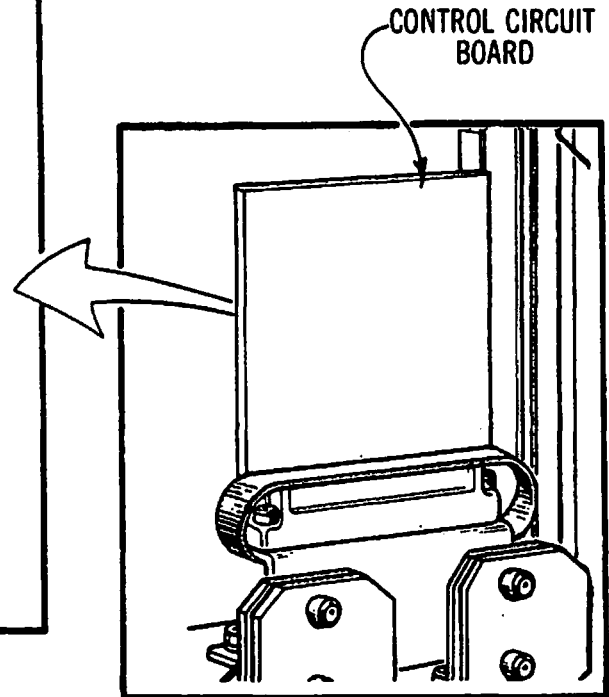
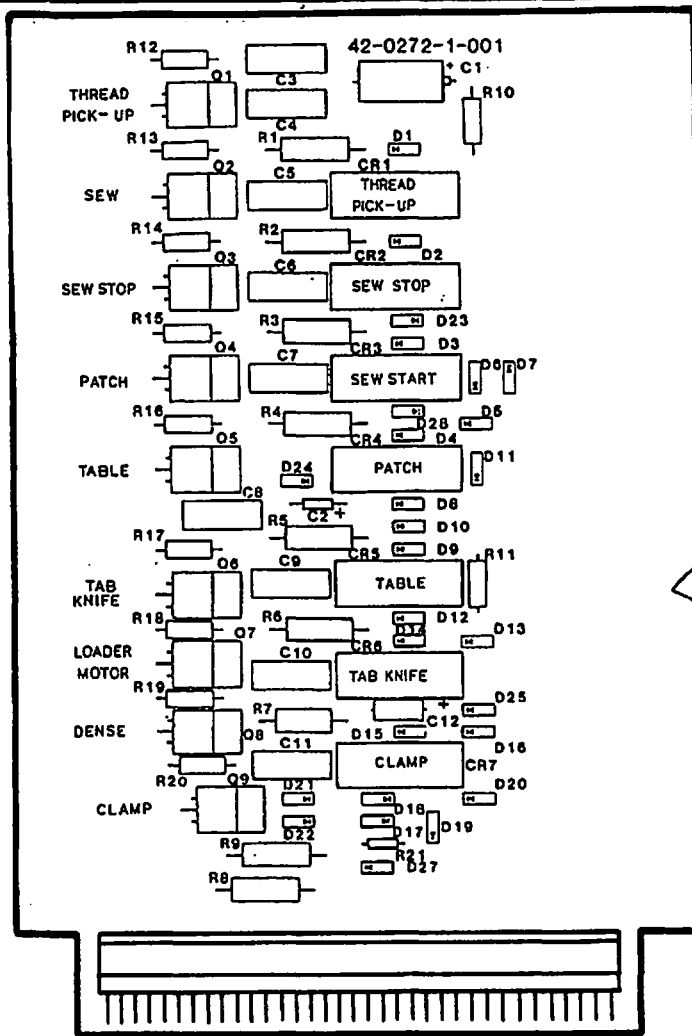
# BARRIER TERMINAL BLOCKS WIRE CONNECTIONS AND TEST POINTS

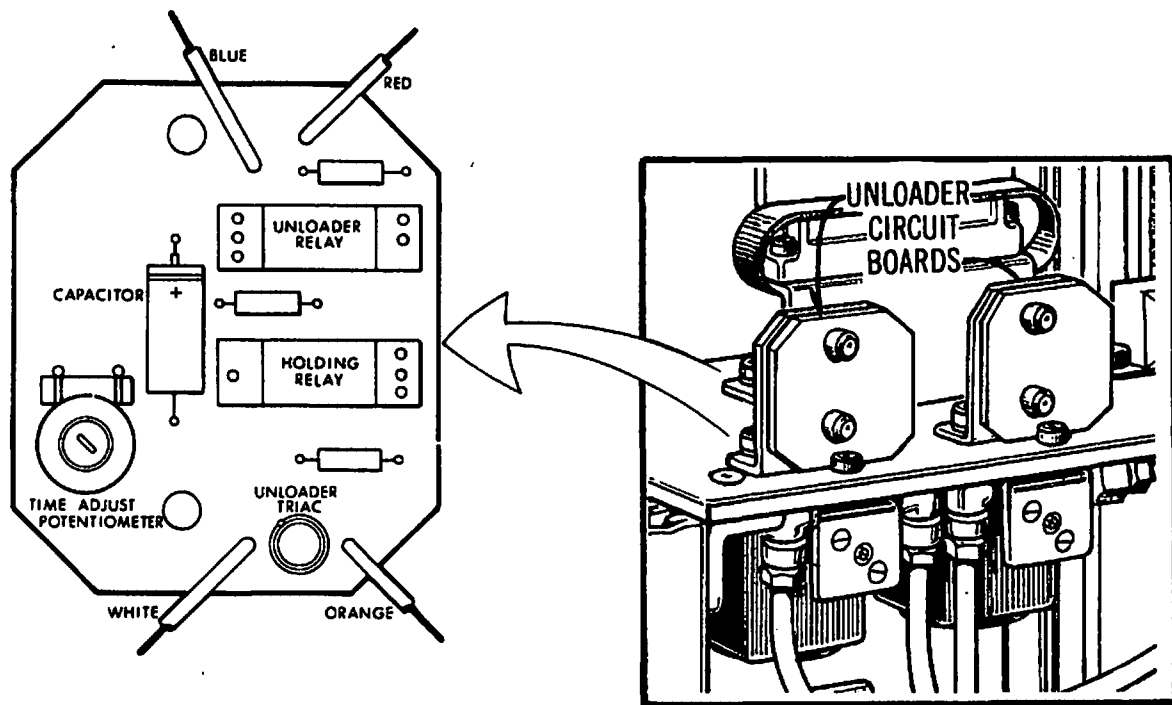
# A65



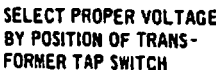
# A66

## CONTROL CIRCUIT BOARD WIRE CONNECTIONS AND TEST POINTS





**100-400 VOLTS 50-60 CYCLE (HERTZ)**

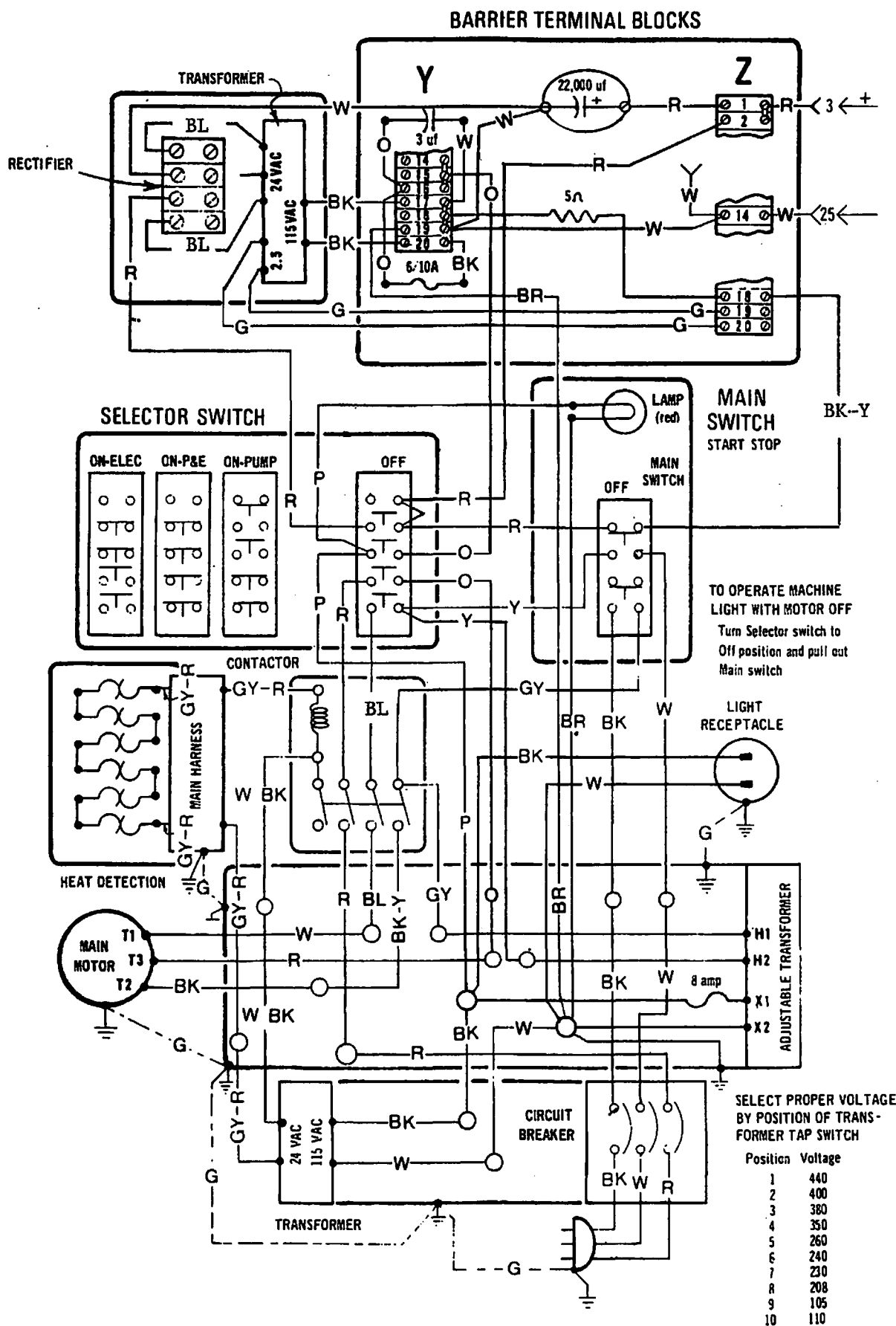


Position	Voltage
1	440
2	400
3	380
4	350
5	260
6	240
7	230
8	208
9	105
10	110

# MULTIPLE PHASE POWER SUPPLY WIRING DIAGRAM

# A69

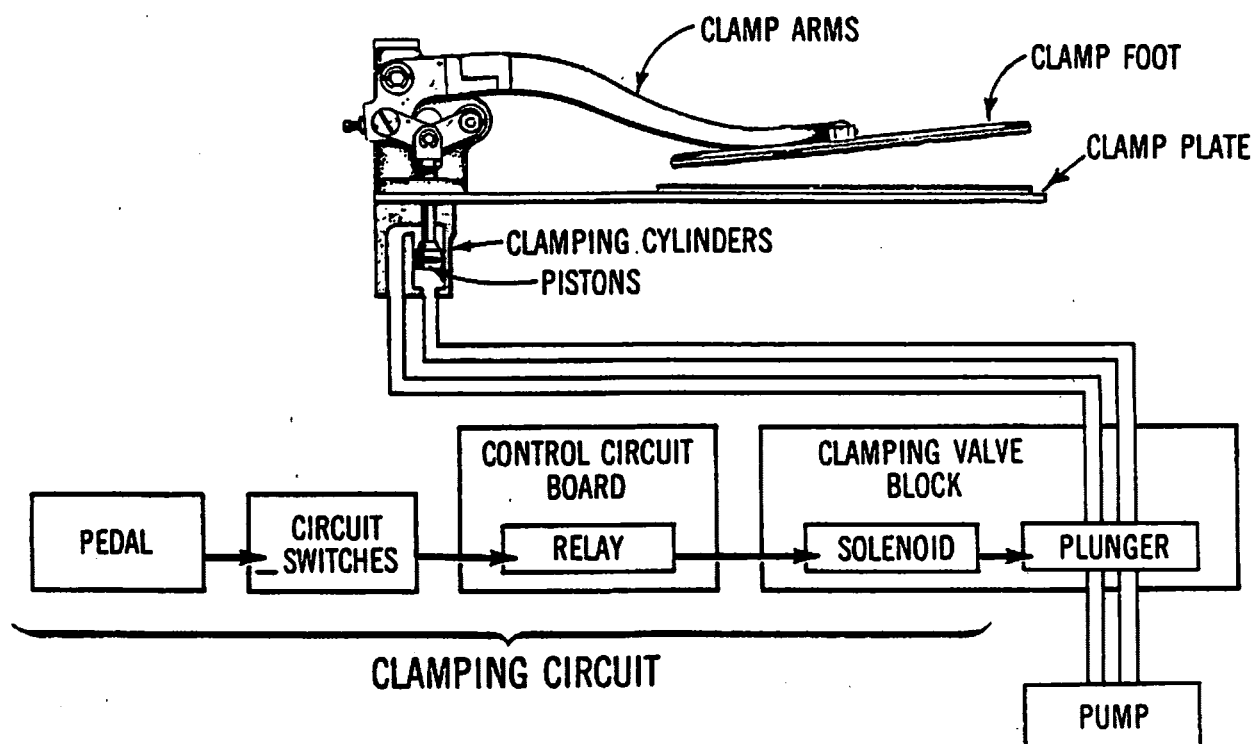
100-400 VOLTS 50-60 CYCLE (HERTZ)



# CLAMPING

Raising and lowering of the Clamp is hydraulically powered and electrically operated by manually actuating the pedal. With Main Switch pulled out to "START" and control panel switches set for desired operating procedure, hydraulic oil flows from pump through the Clamping Valve Block to the bottom of Clamping Cylinders, pushing pistons

up, which in turn causes Clamp to move to its down position. When the pedal is partly depressed, the Clamping Circuit activates the Clamping Solenoid. This causes the plunger in Clamping Valve Block to shift the flow of oil to the top of Clamping Cylinders, pushing pistons down which in turn causes Clamp to rise to its up position.

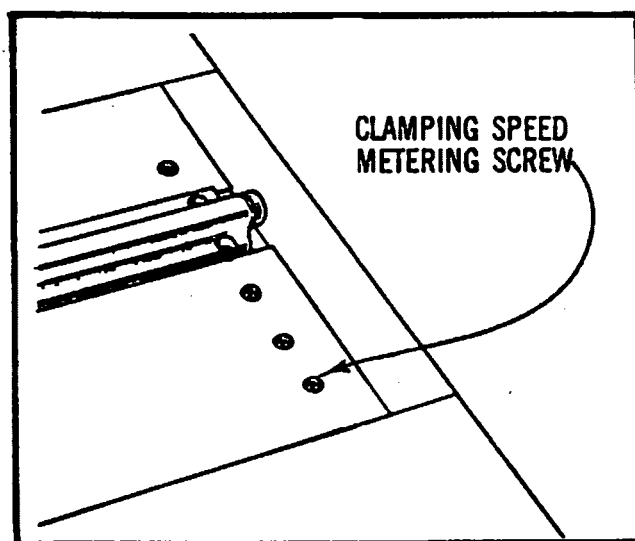


## MAINTENANCE AND ADJUSTMENTS

### CLAMPING SPEED

Clamping speed is adjusted by varying the flow of hydraulic oil to the Clamping Cylinders by means of the Clamping Speed Metering Screw.

**TO ADJUST:** To slow clamping action, turn Clamping Speed Metering Screw in (clockwise). Turning metering screw out (counterclockwise) will produce a faster clamping action.





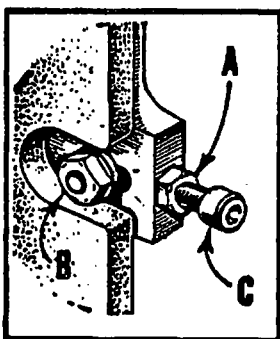
## CLAMP PRESSURE

Adjustments should be made with no material under the clamp. Both clamp arms must be adjusted at the same time.

1. Release all clamping pressure by loosening the nuts (A & B) and then backing off screw (C). Pull Main Switch to "START" and tighten nut (B).

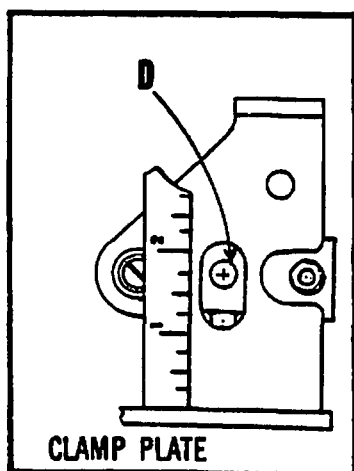
2. Operating Clamp with power "ON", check that levers (E) are in alignment when Clamp is in the down position. This alignment is correct when center of pin (D) is 1-3/4" above clamp plate.

**TO ADJUST:** Loosen nut (G) and turn piston rod (H) in or out of clevis (F) until this alignment is correct. For minor correction, turn piston rod (H) with small pliers. For a greater adjustment, remove fittings under the Clamp Cylinder and turn piston rod from bottom by screwdriver pressing upward while making this adjustment.



3. Apply clamping pressure by turning screw (C) inward until it bottoms, then one-half turn further. Tighten nut (A).

4. Check that Clamp holds material firmly at all points. If slippage occurs under either side of the clamp foot, increase pressure on that side by turning screw (C) slightly further inward, but not



so far that the front of the clamp foot is raised. If tipping occurs, release the pressure of screw (C) the minimum necessary on the side that is low to restore to a level position.

## TROUBLESHOOTING

### CLAMP FAILS TO HOLD THE WORK

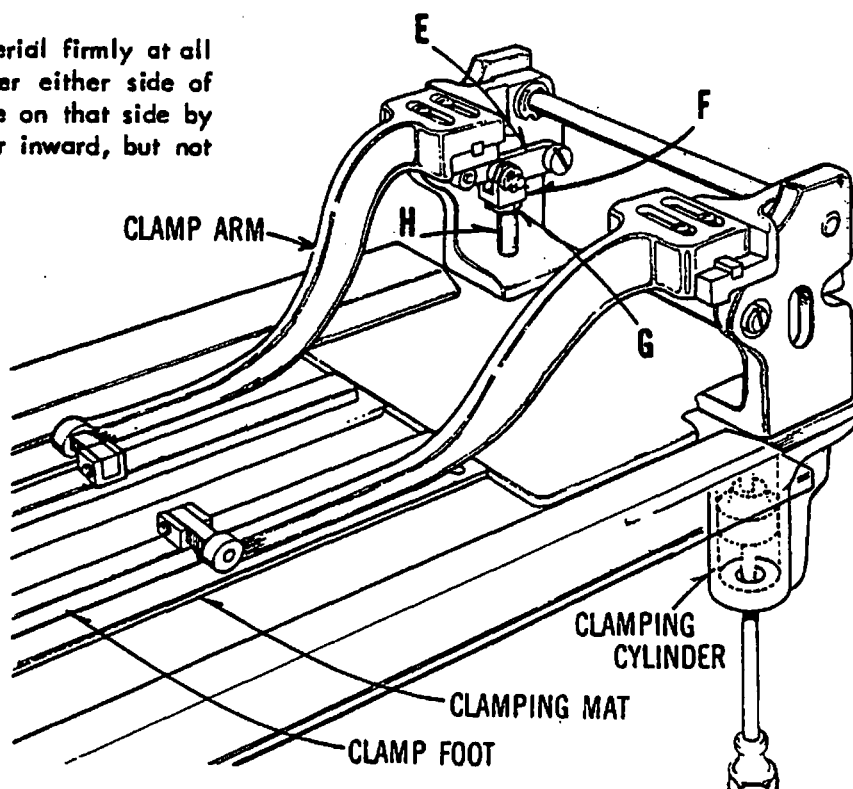
Check pads of clamping mats. Replace if worn. Check rubber soles of clamp foot. Replace if worn. Check and readjust clamping pressure if necessary. If lack of pressure persists, replace "O" rings in the clamping cylinders.

### CLAMP FAILS TO RESPOND TO PEDAL CONTROL

Check clamping speed adjustment. If sluggishness persists, replace "O" rings in clamping cylinders.

### CLAMP OPERATES SLUGGISHLY

Check that Control Panel is set for desired operating procedure. Check clamp pressure adjustments for binding. If trouble still persists, recheck the Clamping Circuit.





# CLAMP TABLE TRAVEL

Clamp Table and Intermittent Feeding are hydraulically powered and electrically operated as follows:

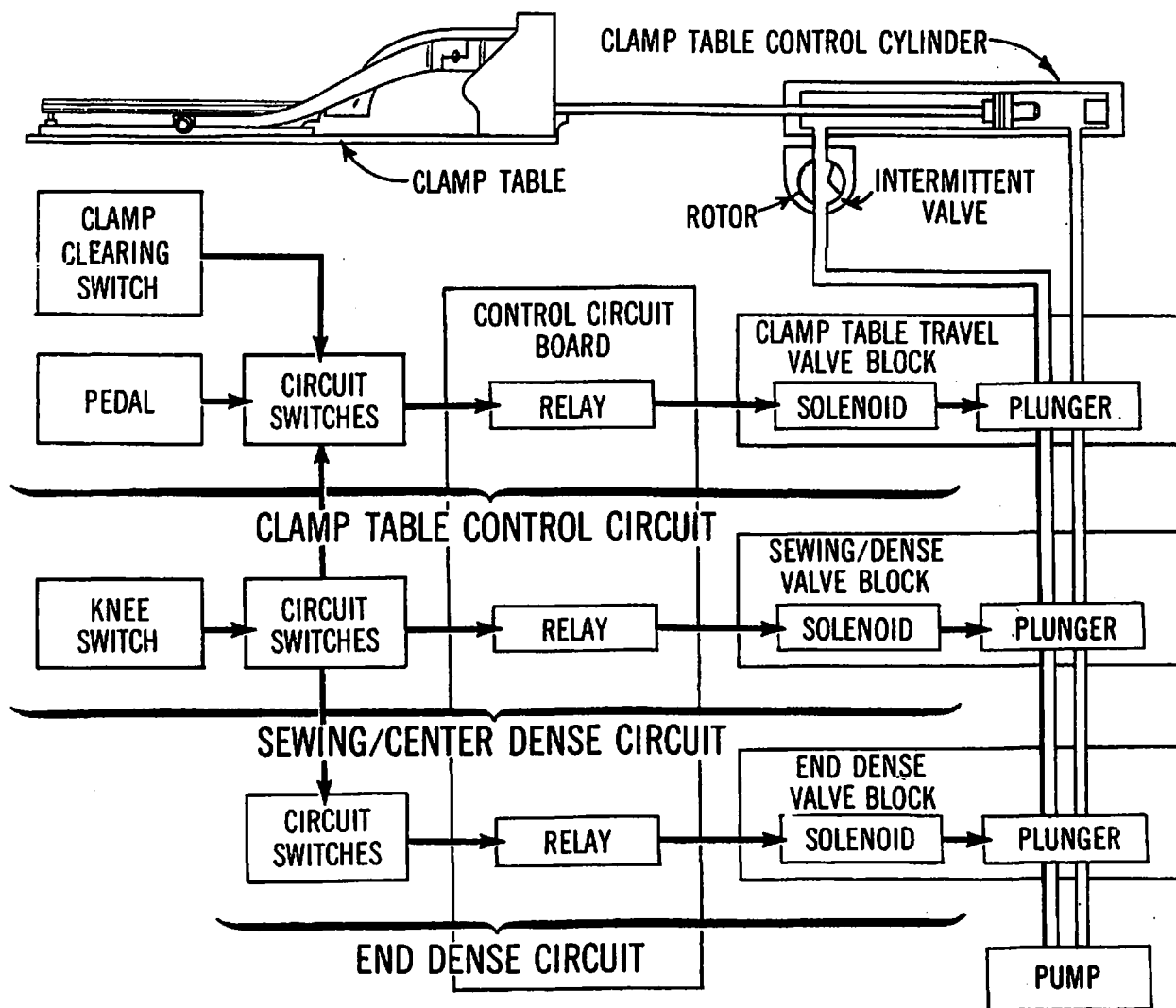
## CLAMP CLEARING-BACK (not sewing)

When the Clamp Table is in its forward position, Clamp Clearing Switch operates the Clamp Table Control Circuit to energize Clamp Table Solenoid. This establishes a holding circuit to continue energizing the solenoid, and lowers the Clamp Table Plunger, directing oil to the front of the Clamp Table Control Cylinder. This action moves the Clamp Table back and maintains this position until the holding circuit is broken. (Described in the following paragraphs.) Sew/Center Dense Valve Block and End Dense Valve Block are fully open

at this time allowing free flow of oil for fast movement of the Clamp Table.

## CLAMP CLEARING-FORWARD (not sewing)

When the Clamp Table is in its back position, moving Clamp Clearing Switch to "FORWARD" breaks the holding circuit. This deenergizes the clamp table solenoid shifting plunger of the Clamp Table Control Valve Block up so that oil from the pump is directed to the rear of Clamp Table Control Cylinder, causing the Clamp Table to move to its forward position. Sewing/Center Dense and End Dense Valve Blocks are still fully opened, allowing for fast movement of Clamp Table.



## INTERMITTENT CLAMP TABLE FORWARD TRAVEL AND STITCH DENSITY

With the Clamp Table in its back position, the Knee Switch (sewing) is pressed, breaking the Clamp Table holding circuit by deenergizing the Clamp Table solenoid thus raising the plunger of the Clamp Table Valve Block. This allows oil from front of Clamp Table Control Cylinder to exhaust through the Intermittent Valve.

The Clutch is also engaged when the Knee Switch is pressed. This causes the rotor of the Intermittent Valve to turn with the drive shaft regulating the bleed-out of oil from the front side of the piston of Clamp Table Control Cylinder. This action

allows the Clamp Table to travel forward only when needles are out of the work. At the end of the sewing cycle, both Sew/Dense and End Dense plungers rise and the rotor of the Intermittent Valve stops. This provides fast final Clamp Table travel to its forward position.

The End Dense Solenoid is energized and deenergized twice during the sewing cycle -- for short periods at the beginning and end of the sewing cycle. This provides for closer stitch density required at each end of the welting. The Sew/Center Dense Solenoid is energized throughout the cycle and regulates stitching density at the center of the welting when the End Dense Solenoid is not energized.

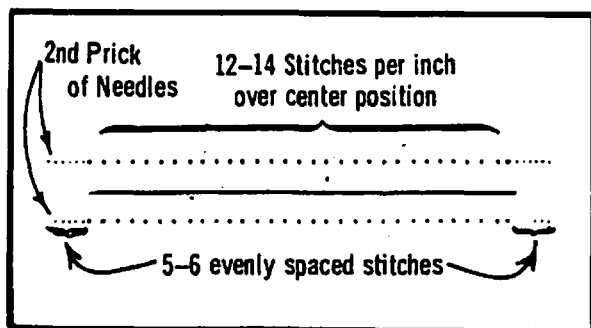
## MAINTENANCE AND ADJUSTMENTS

### PRICKING-IN TEST

If stitch spacing is in doubt or a skip of the first stitch persists despite correct adjustment of the related sewing elements, it would be wise to make a "pricking-in" test as follows:

1. Install "pricking" needles prepared from #950 class needles shortened to 1-9/16" overall and sharpen to a point.
2. Place a sheet of strong paper under clamp and operate machine through its sewing cycle.

Observe that pattern of stitch spacing conforms to diagram, if not correct pattern.



### STITCH DENSITY AND CLAMP TABLE TRAVEL SPEED

These adjustments must be made in the following order with the machine at normal operating temperature.

### CLAMP TABLE TRAVEL SPEED (not sewing)

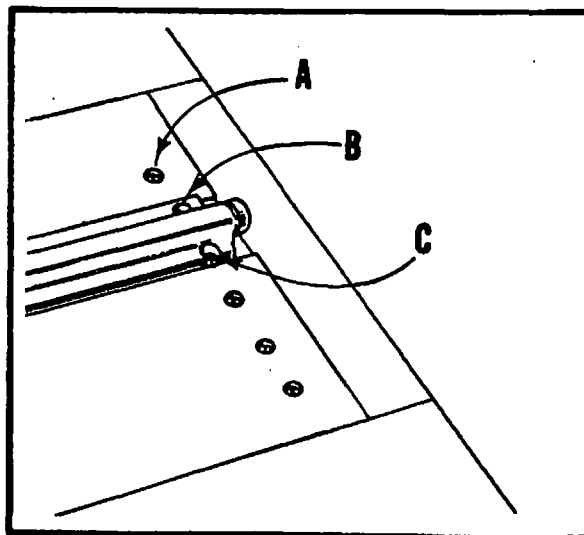
Clamp Table should operate at moderate speed. Turn meter screw (A) out (counterclockwise) for faster travel. Turn in (clockwise) for slower travel.

### CENTER STITCH DENSITY

Recommended density is 12 to 14 stitches per inch. Turning metering screw (B) in (clockwise) for more stitches. Turn out (counterclockwise) for fewer stitches.

### END STITCH DENSITY

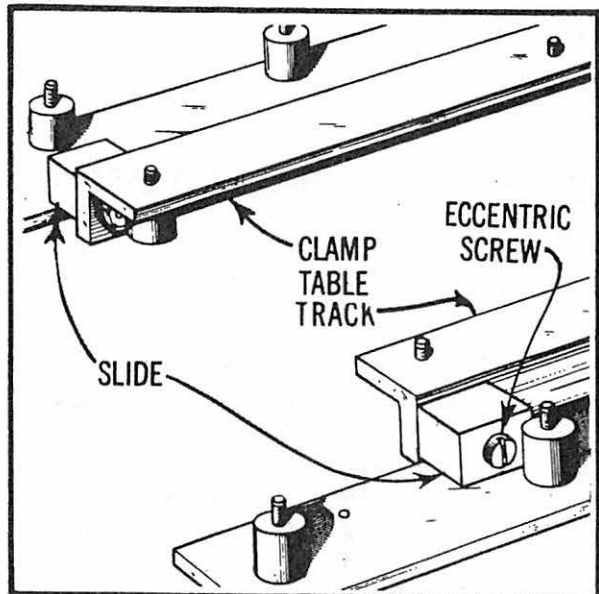
Recommended density is 22 to 24 stitches per inch. Turn metering screw (C) in (clockwise) for more stitches. Turn out (counterclockwise) for fewer stitches.



## CLAMP TABLE SLIDES

Slides which ride on Clamp Table Tracks should be adjusted to raise the Clamp Table sufficiently to prevent rubbing against the Bedplate.

**TO ADJUST:** Set slides by turning eccentric screws to set the Clamp Table to obtain the proper clearance.

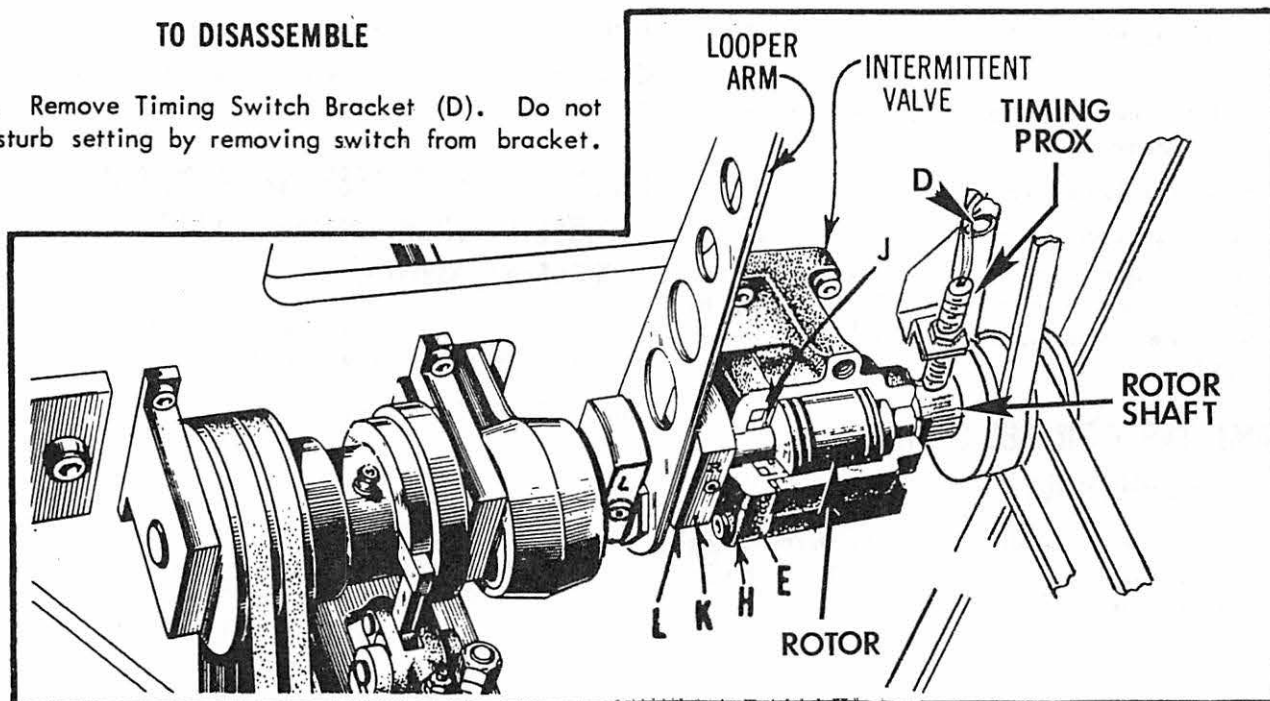


## INTERMITTENT VALVE

Adhere to the following procedure when removing or installing the Intermittent Valve.

## TO DISASSEMBLE

1. Remove Timing Switch Bracket (D). Do not disturb setting by removing switch from bracket.



2. With Drive Shaft in "Locked" Position, remove Rollpin (K).

3. Disconnect both of the hydraulic tubes from the Intermittent Valve.

4. Disconnect Pin (F) from Connecting Rod.

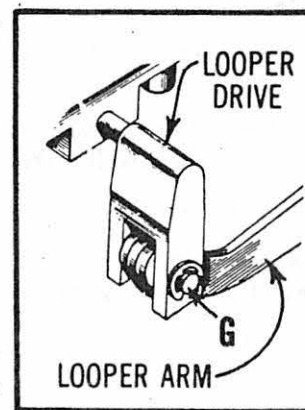
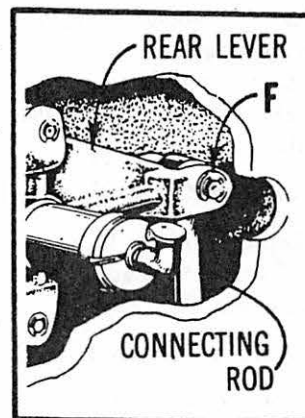
5. Disconnect Pin (G) allowing Looper Arm to hang free.

6. Remove (4) screws holding the intermittent Valve to Bedplate.

7. Intermittent Valve can now be removed from Drive Shaft by turning the valve down toward the front of machine and pulling to the right.

8. Remove Rollpin (E) and crank Block (L) from Intermittent Valve.

9. Before removing End Cover (H) and Rotor, eliminate all sharp edges on Rotor Shaft and wipe clean to avoid damage to Oil Seals (J).



### TO REASSEMBLE

1. Before reassembling the Intermittent Valve, clean and remove any sharp edges from replacement parts in order to avoid damage to Oil Seals. Also check that Cover Gasket and all Oil Seals are all in good condition.
2. Replace Crank Block (L) and Rollpin (E).
3. Replace Intermittent Valve on Drive Shaft and attach valve to Bedplate. Do not tighten screw at this time.
4. Replace Rollpin (K).
5. Connect the Looper Arm to Looper Drive with Pin (G).
6. Attach the Connecting Rod to the Rear Lever with Pin (F).
7. Rotate Drive Shaft to allow the Intermittent Valve to center itself. Tighten all screws.
8. Attach hydraulic tubes to Intermittent Valve.
9. Reassemble Timing Switch Bracket (D) on Bedplate. If necessary, check Timing Switch setting (Page A56).

## TROUBLE SHOOTING

### CLAMP TABLE FAILS TO TRAVEL

Check for mechanical obstructions to Clamp Table movement.

Check for broken piston rod of Clamp Table Travel Cylinder Assembly.

Check Clamp Table Control Circuit.

Check Drive Shaft. If Drive Shaft has been disassembled, Intermittent Valve may be 180 degrees out of time, which is cutting off oil supply to Clamp Table Travel Cylinder. See Drive Shaft Assembly.

### CLAMP TABLE TRAVEL SLOWLY OR IRREGULARLY

Clear air from hydraulic system by turning the Clamp Clearing Switch from FORWARD to BACK positions several times.

Detach Clamp Table from piston rod and check that Clamp Table moves freely by manual operation.

Check End Density, Center Density and Clamp Table Travel metering screws and, if necessary, readjust.

Check Clamp Table Control Circuit and Stitch Density Circuit.

If trouble persists, replace all Quad and "O" Rings in Clamp Table Travel Cylinder.

### CLAMP TABLE MAKES LONG FEED STROKE AT LAST STITCH

Check adjustments of the Stop Motion and the Timing Switch.

See that Oil Check in Center Density Manifold Block is properly placed. Oil check moves to slow plunger on its return to the "UP" position.

NOTE: The plungers in the manifold valve blocks are not completely interchangeable. In order to avoid possible confusion, remove and replace plungers one at a time.

### CLAMP TABLE CONTINUOUSLY TRAVELS BETWEEN FORWARD AND BACKWARD POSITION AND SEWING WILL NOT STOP

Check adjustments of the Length Switch and the Timing Switch.

Check that the Length Switch is actuated before the Length Safety Switch.

### CLAMP ARMS CHATTER WHEN CLAMP TABLE IS OPERATED BY CLAMP CLEARING SWITCH

Check for broken or weak springs on solenoid at Clamp Table Manifold Valve Block.

Check Clamp Table Control Circuit.

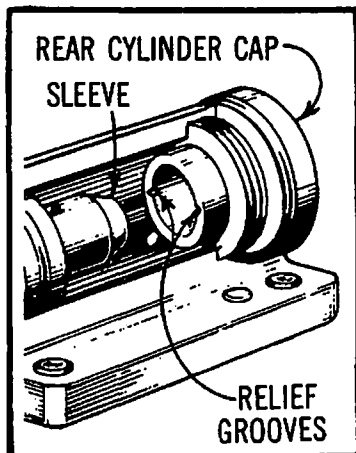


## FIRST STITCH SKIPS DUE TO SLOW STARTING OF CLAMP TABLE

1. A partial vacuum created between Sleeve and Rear Cylinder Cap may delay the initial sewing travel of the Feed Piston.

### TO ADJUST:

Check that, as the Clamp Table is returning to the "start/sew" position, there is no hesitation in the Clamp Table Travel during the last inch of rearward travel. Any hesitation noted at this point indicates that the fit of the Sleeve into the Cap is too tight causing a similar hesitation when the Sleeve starts forward out of the Cap. Using a small three cornered file, cut two light relief grooves lengthwise and opposite each other in the inside diameter of the cap opening. The grooves should not exceed .015 inches in depth. If the grooves are cut too deeply, a pounding action will result each time the Clamp Table is sent back because the cushion of oil, between the Sleeve and the Cap, will dissipate too quickly.

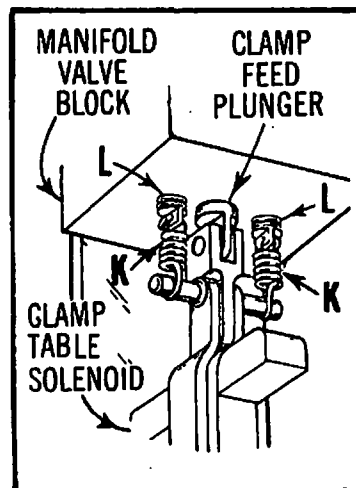


Any evidence of shine marks on the sleeve, should be removed with emery cloth as this indicates high spots which may cause sticking.

2. Too little tension on the Clamp Table Solenoid Springs (K) or a sticking "O" Ring on the Clamp Feed Plunger can create a hesitation in the initial clamp forward feed.

### TO ADJUST:

In addition to using a new "O" Ring on the plunger, the tension of the Solenoid Springs (K) can be increased by screwing Spring Anchors (L) farther into Manifold Valve Block to speed up release of Clamp Table Solenoid.



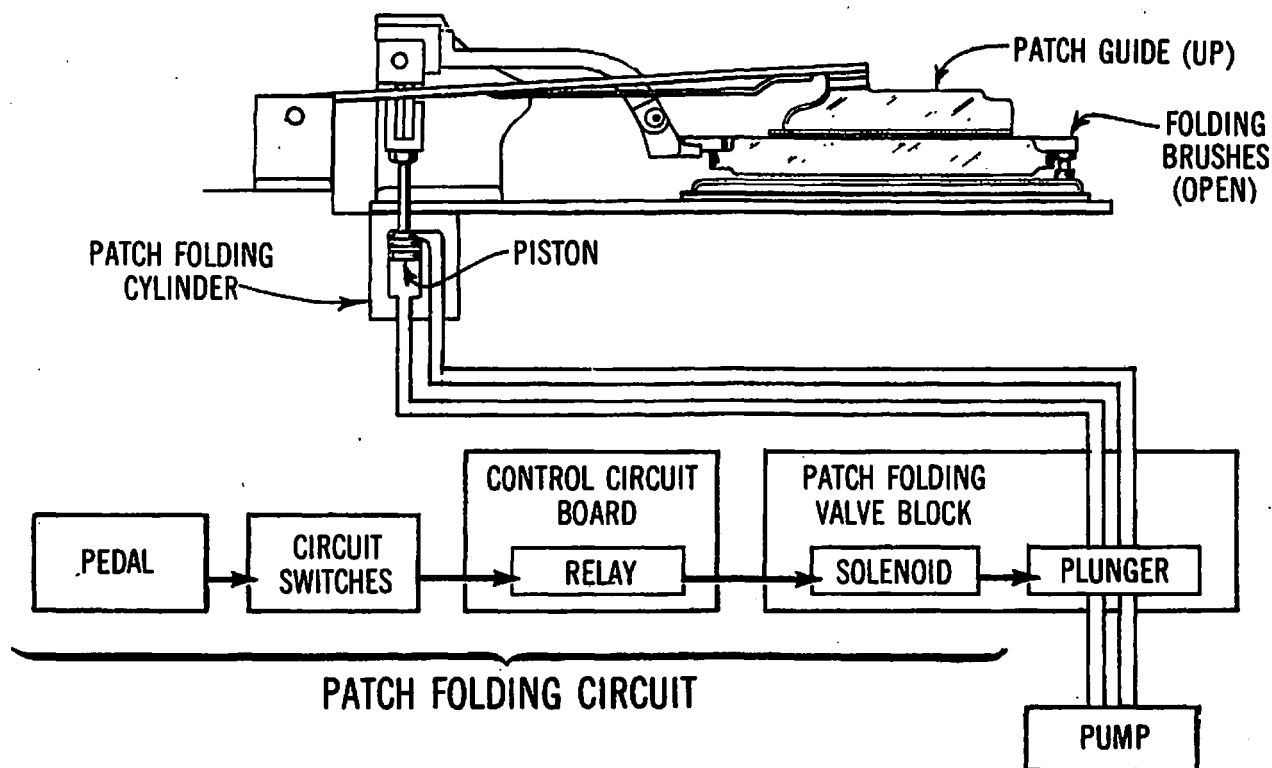
3. The setting of the Clutch Dog Switch is critical in that the Clamp Table Back Holding Circuit must be broken as quickly as possible after the Start-Sew Solenoid is energized.

**TO ADJUST:** Check this adjustment by referring to the Electrical Components Section under the Clutch Dog Switch.

## PATCH FOLDING

Patch Folding is hydraulically powered and electrically operated. Operating the pedal controls the electrical circuit which energizes the solenoid of the Patch Folding Circuit. This solenoid controls a manifold plunger which shifts the flow of oil to the Patch Folding Cylinder. When solenoid is de-energized, plunger movement causes oil to flow to

top of the Patch Folding Cylinder. This pushes piston down to lower the Patch Guide and to close the Patch Folders. Energizing the Solenoid and the resulting valve movement, directs oil to the bottom of the Patch Folding Cylinder. This pushes the piston up to raise the Patch Guide and open the Patch Folders.

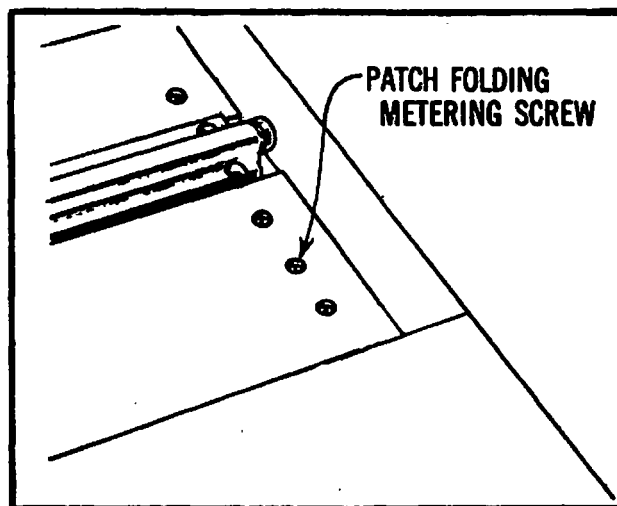


## MAINTENANCE AND ADJUSTMENTS

### PATCH FOLDING SPEED

Speed of Patch Guide and Patch Folders is adjusted by varying the flow of hydraulic oil to the Patch Folding Cylinder by means of the Patch Folding Metering Screw.

**TO ADJUST:** Turning Patch Folding Metering Screw in (clockwise) slows movement. Turning this metering screw out (counterclockwise) produces a faster patch folding action.





## PATCH GUIDES

**IMPORTANT:** THE PATCH GUIDE IS FACTORY POSITIONED FOR EXACT CENTRALIZATION. DO NOT CHANGE LOCATION OF THE HINGE BRACKETS

### ELIMINATION OF SIDE PLAY

If play exists between the Patch Guide and the Patch Guide Arm, tighten screws (A) sufficiently for slight restraining of the Patch Guide. If play exists between the Patch Guide Arm and Hinge Brackets, loosen only one Hinge Bracket and, while pressing brackets together, retighten screws (B). As long as one Hinge Bracket remains fixed, Patch Guide Arm will remain centralized.

### LEVELING OF PATCH GUIDE

The bottom surface of the Patch Guide should rest flat on the top surface of the Throat Plate. For front to back alignment, adjust by screw (C). For crosswise alignment, adjustment is made by bending Patch Guide Arm as needed.

### PATCH GUIDE/THROAT PLATE ALIGNMENT

Align Patch Guide by screws (D) so that needle slots are in line with needle slots of Throat Plate. If Patch Guide cannot be aligned by screws (D) then reposition entire Patch Guide Arms by means of screws (L), then adjust Patch Guide by means of screws (D).

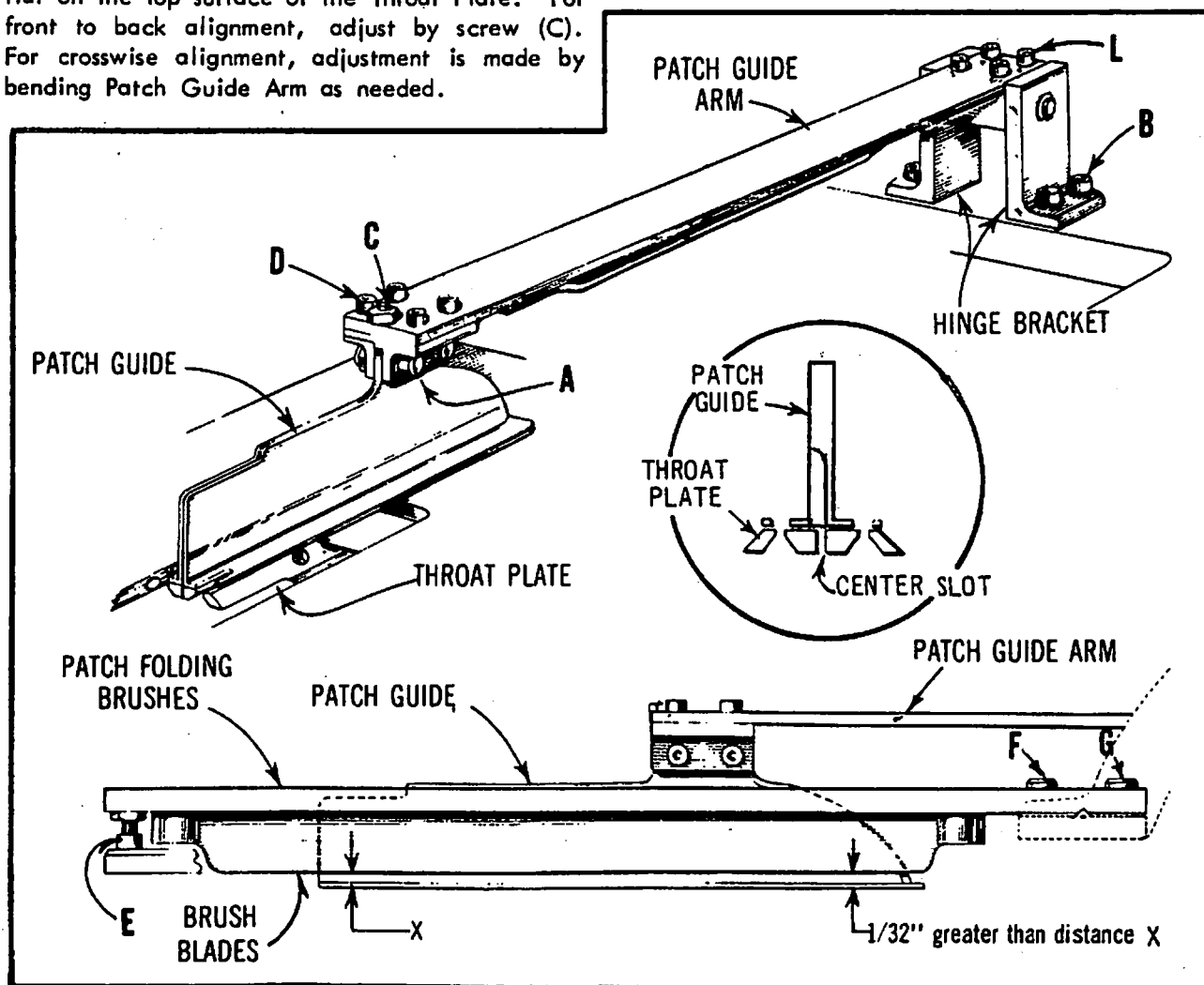
### PATCH FOLDING BRUSHES

The Patch Folding Brushes must be adjusted to fold the Welting and Backing Material snugly into the corners of Patch Guide.

The material must also fit evenly against entire length of Patch Guide.

### PRELIMINARY CHECK POINTS

Check Patch Guide adjustment. Patch Folding Brush Blades must be correct for the weight of welting material. Refer to Foldout I, "Corresponding Replacement Parts for Reece Series 32 Welting Machine at the rear of this Manual.



## VERTICAL ADJUSTMENTS

Adjust the front edge of the Brush Blades to the lowest level that will fold the Welting and Backing Material snugly into the corners of the Patch Guide.

**TO ADJUST:** Obtain this setting by means of screws (E).

Rear end of Brush Blades must then be set  $\frac{1}{32}$ " higher than the front edge of Brush Blades.

**TO ADJUST:** Combination of loosening and tightening screws (F & G) will vary height of rear end of Brush Blades. To raise rear end, loosen screw (G) and tighten (F). To lower, loosen screw (F) and tighten (G).

## HORIZONTAL ADJUSTMENTS

The Brush Blades must close parallel to the Patch Guide and with clearance on each side of the Patch Guide equal to the thickness of Welting and Backing Material. To assure accurate performance, it is essential that the correct relationship exists between the Patch Folding Arms, Slide Blocks, Slide Bracket and Clevis. Refer to Foldout II at the rear of this manual so that proper settings are established before performing the following adjustments.

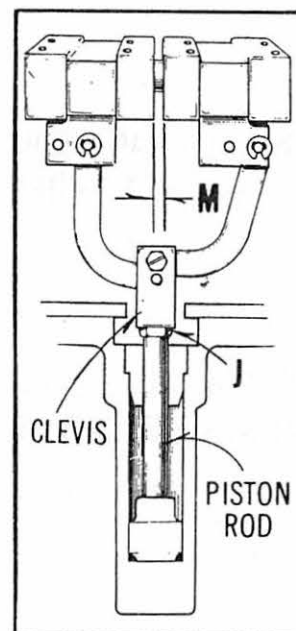
**TO ADJUST:** After proper settings are obtained, it may still be necessary to re-establish parallel relationship between Brush Blades and Patch Guide by means of screws (F).

Further adjustment for more or less clearance between Patch Guide and Brush Blades can be obtained by turning Piston Rod in or out of Clevis.

**TO ADJUST:** Loosen Nut (J) and using a pair of pliers (03-0123 ignition pliers) turn

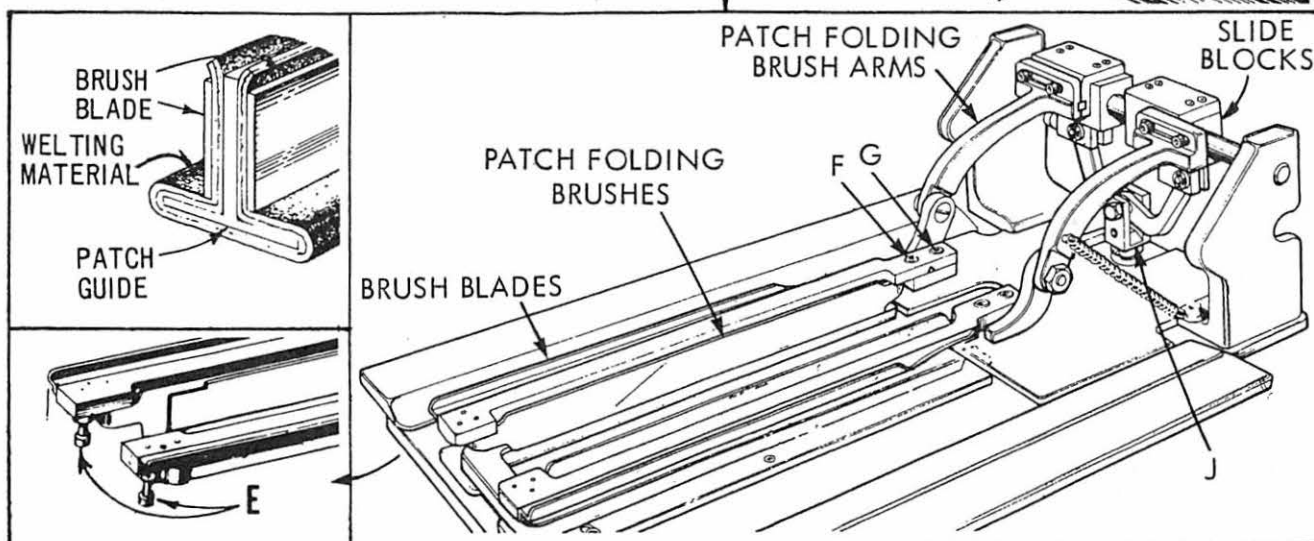
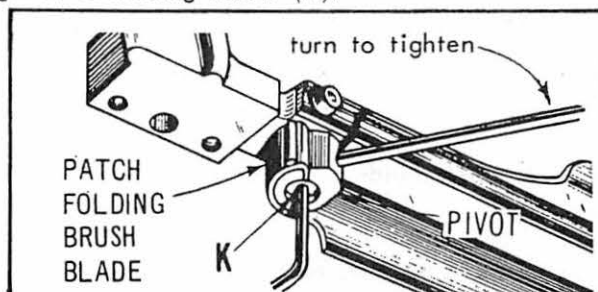
Piston Rod in or out of Clevis. Keep pliers close to Nut (J) when making adjustment. Clearance (M) varies with Patch Guide setting used when Patch Folding Brush Arms are in the closed position.

**IMPORTANT:** Patch Folding Brushes must not deflect Patch Guide when Welting and Backing material is being folded. If this occurs, uneven welting or needle breakage may result.



## INSTALLATION OF PATCH FOLDING BRUSH BLADES

Install Patch Folding Brush Blades by loosening screws (K) at both ends of Patch Folding Brush. Install Brush Blade to full depth of slot in Pivot. Tighten screw (K) at one end of Brush. Then placing hex wrench in Pivot at the other end of Brush turn to draw the Brush Blade taut. Finally tighten remaining screw (K).



**TROUBLESHOOTING****WELTING AND BACKING PATCHES  
ARE NOT PROPERLY FOLDED**

Check the Patch Guide and Patch Folding Brushes Adjustments.

Check information on pages 7-9.

**PATCH GUIDE AND PATCH FOLDERS  
DO NOT OPERATE AT DESIRED SPEED**

Check Patch Folding Adjustments. If sluggishness persists at maximum speed (metering screw all the way out), check oil level in pump. If sluggishness still persists, replace "O" rings in the Patch Folding Cylinder.

**PATCH FOLDERS FAIL TO RESPOND  
TO PEDAL CONTROL**

Check the following points:

That the Control Panel is set for the desired operating procedure.

Oil in pump is at proper level.

No binding or interference exists in the Patch Guide or Patch Folding mechanism.

Recheck Patch Guide and Patch Folding Brushes adjustment.

If trouble still persists, recheck the Patch Folding circuit.

**WELTING PATCH DOES NOT TRAVEL  
PROPERLY ALONG PATCH GUIDE**

Check Patch Guide Adjustments.

Check condition of Patch Guide. There should be no nicks or scratches that would prevent the Welting Patch from sliding off the Patch Guide. The tail end of the Patch Guide must be smooth and have sufficient radius to allow the forming of the Welt and also to allow the Welt to travel smoothly on to the Patch Guide.

When using material that is slippery and difficult to hold (i.e., lining material), small pads of adhesive-backed urethane foam should be placed on the Brush Blades. Check that the pads do not extend beyond the length of the Patch Guide.

## AUTOMATIC PATCH LOADING

Automatic Patch Loading is electrically controlled and operated.

With Control Panel Switches set for the desired operating procedure and with Patch Tray loaded with Welting and Backing Material, pressing the Pedal will start the following automatic sequence:

Clamp will lower on Stay and Work Material.

Clamp Table will travel to its rear position.

Automatic Patch Loader will load Welting and Backing Material into position.

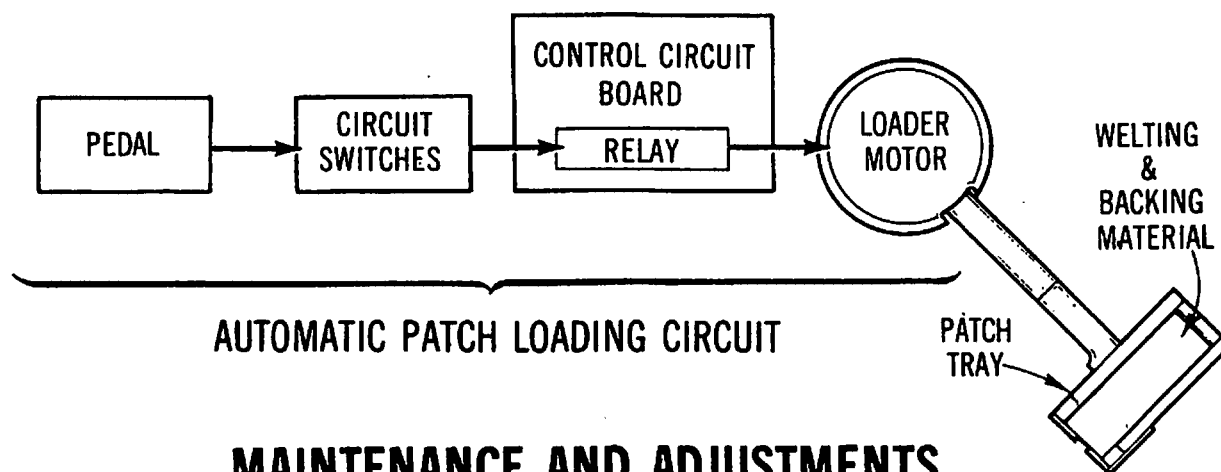
Patch Folders will fold Welting and Backing Material around Patch Guide.

Patch Tray will return to its rest position.

Sewing and Center Cutting will be completed.

Patches will be turned and Tabs cut.

Upon completion of the Sewing and Turning, the Clamp will rise and the Work is removed.



## MAINTENANCE AND ADJUSTMENTS

### PATCH LOADER AND STOP

For proper Loading and Folding of the Welting and Backing Patches, the following conditions must be met:

1. Smooth and uninterrupted movement of the Patch Loader Arm.
2. The Arm should not be deflected or bind as it contacts the Stop.
3. Sides of the Patch Tray should be parallel with the sides of the Patch Guide.
4. A 1/2" clearance between the Needles and the inside edge of Back Block when Patch Tray is in loading position.
5. Patch Guide must be centered in the opening of the patch tray.

In order to make these adjustments, the Automatic Patch Loader should be set to operate manually.

Set the Control Panel Switches as follows:

Main .....	Pull to Start
Selector .....	P & E
Clamp Safety .....	Rep.
Loading .....	Man. Front
Loader Sew .....	Off
Clamp Clearing ...	Center
Fingers .....	Semi

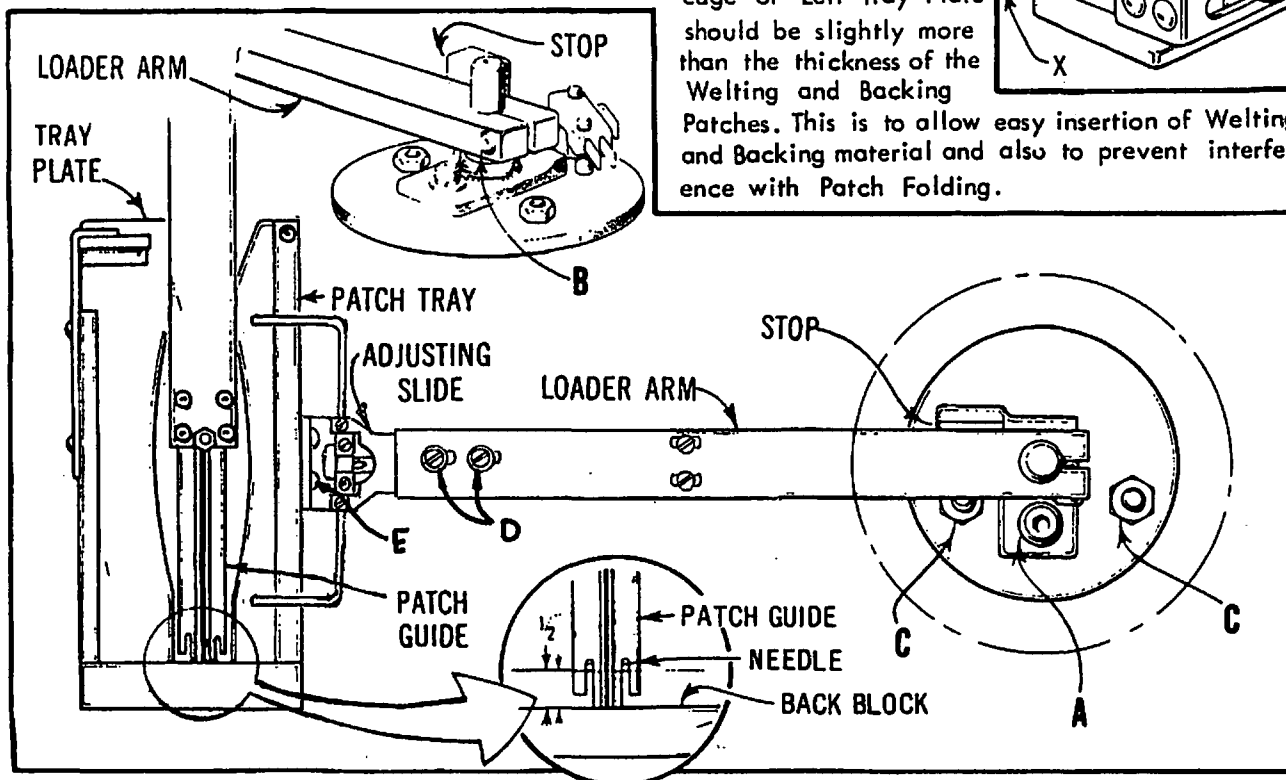


### ADJUSTMENT PROCEDURES

1. Return Clamp Table to its back position.
2. Loosen Stop by means of Screw (A).
3. Locate extreme forward movement of Loader Arm by operating Knee Control. Operate the Knee Control several times to determine its most forward point.
4. With the Patch Loader in this position, set the Loader Arm so that sides of Patch Tray are parallel with side of Patch Guide.
5. Set Stop to lightly contact the Loader Arm while Arm is in loading position. Operate Patch Loader several times at this setting, checking that no bounce or binding exists as the Loader Arm makes contact with the Stop.
6. With the Loader Arm held against Stop (Spring Clip 03-0193 may be used for this purpose) set inside edge of Back Block of Patch Tray  $1/2''$  from needles.

**TO ADJUST:** Loosen screws (E) to obtain this setting. This  $1/2''$  setting can also be obtained by loosening nuts (C) and repositioning entire Patch Loader Motor Assembly.

While making these adjustments, maintain the parallel relationship between the Patch Guide and the sides of the Patch Tray. After obtaining the adjustments, operate the Automatic Patch Loader several times to check that no binding exists.



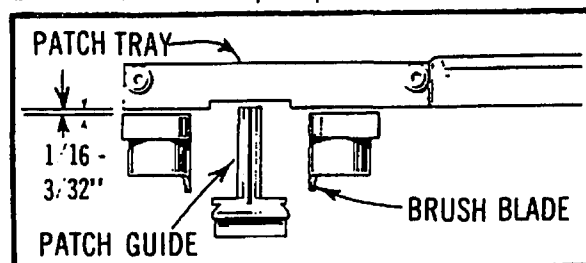
### PATCH GUIDE AND PATCH TRAY ALIGNMENT

Patch Guide must be centered between Left and Right Tray Plates of Patch Tray.

**TO ADJUST:** Loosen screws (D) and set Adjusting Slide to obtain proper setting.

Clearance between underside of Patch Tray and top of brushes should be approximately  $1/16''$  to  $3/32''$ .

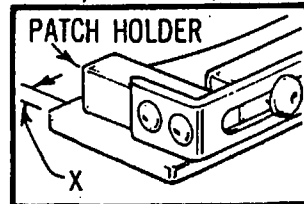
**TO ADJUST:** Loosen screw (B) to raise or lower Loader Arm. Take care not to lose previous Loader Arm and Stop adjustment.



### PATCH HOLDER

Patch Holder is used to keep the Welting and Backing Patches in place as they are being carried to the loading position.

The distance (X) from the Patch Holder and front edge of Left Tray Plate should be slightly more than the thickness of the Welting and Backing Patches. This is to allow easy insertion of Welting and Backing material and also to prevent interference with Patch Folding.



**TROUBLESHOOTING****MACHINE WILL NOT SEW AND  
LOADER ARM CONTINUES  
TO OSCILLATE**

Automatic Sew Switch is not actuating when Loader Arm returns to its rest position. (See page A62)

**WELTING PATCHES ARE NOT  
BEING SQUARELY FOLDED**

Check that Patch Guide and Patch Tray are parallel when Loader Arm is in Loading Position. (See page A84.)

**AUTOMATIC PATCH LOADER BINDS  
OR REMAINS IN LOADING POSITION**

Incorrect relationship between the Stop and Patch Loader Arm. (See page A84.)

**PATCH LOADER ARM MOVES  
BACKWARDS BEFORE STARTING  
FORWARD TO LOADING POSITION**

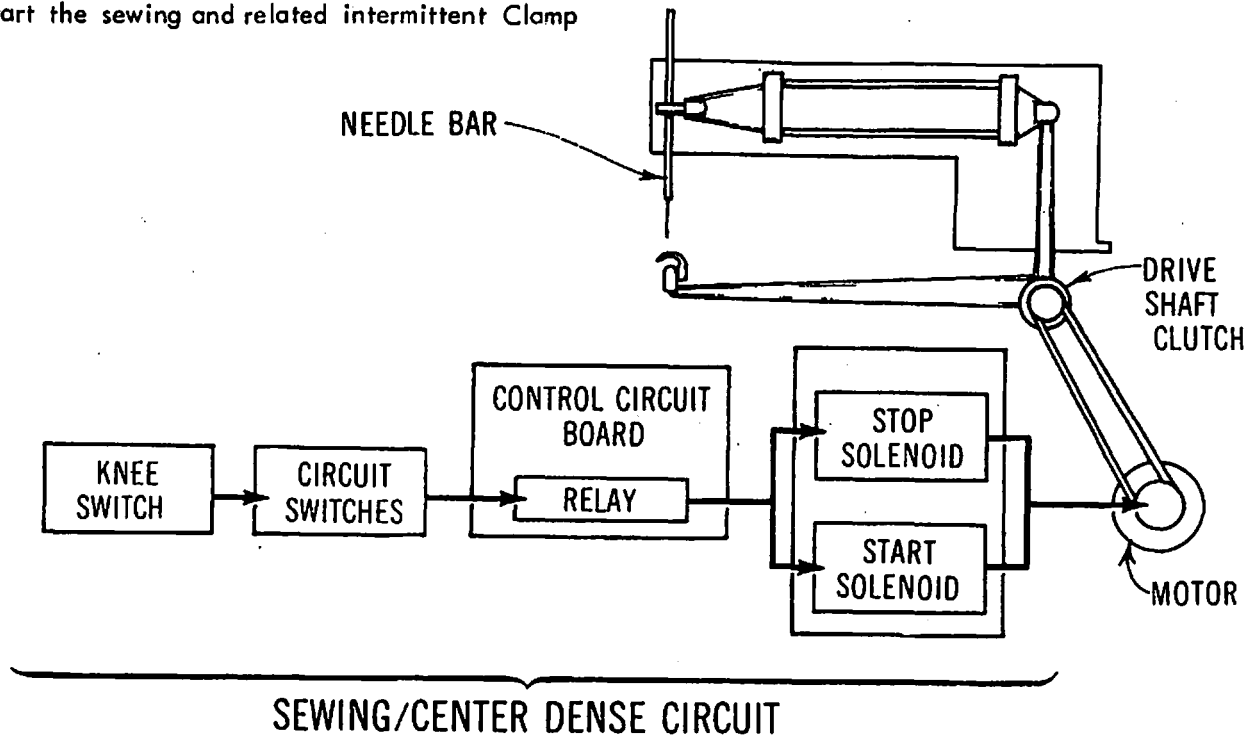
Loader Motor Switch is being actuated prematurely (i.e., before Loader Arm has reached rest position). (See page A62)

**CAUTION:** Do not disconnect power source or push Main Switch in to stop machine while the Loader Arm is in Loading position. Damage to the Loader Arm and Loader Motor may result as Clamp Table travels forward.



The Sewing Mechanism is belt driven and electrically operated. When the Knee Switch is pressed, the Sew/Center Dense Circuit actuates the Start Sewing Solenoid, engaging the Drive Shaft Clutch to start the sewing and related intermittent Clamp

Table Travel. Sewing then continues until the circuit automatically actuates the Stop Sewing Solenoid, disengaging the Clutch and latching the Stop Motion with the Needle Bar in its Up position.



## MAINTENANCE AND ADJUSTMENTS

### THREAD TENSION

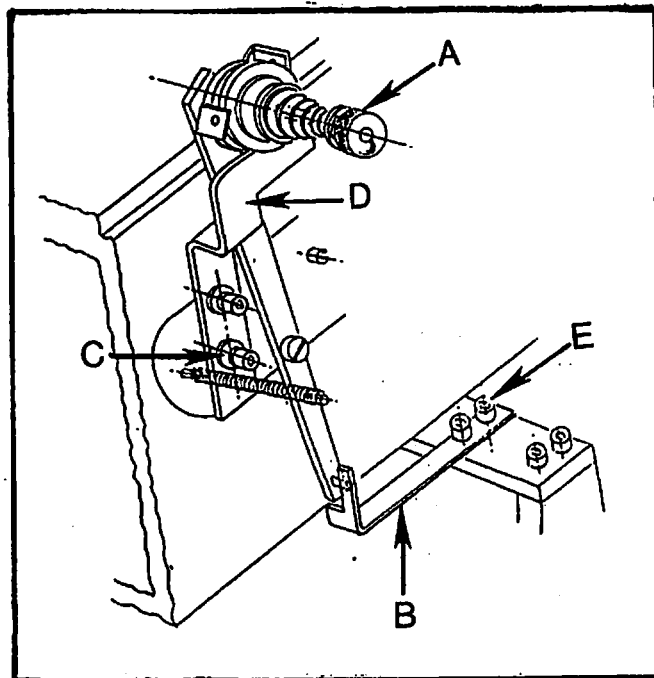
Adjust tensions (A) for minimum tightness that will firmly set stitching.

### STARTING THREAD

For more starting thread, loosen screws (E) and move actuator (B) backward; for less starting thread, move the actuator forward.

### THREAD RELEASE FOR FIRST STITCH

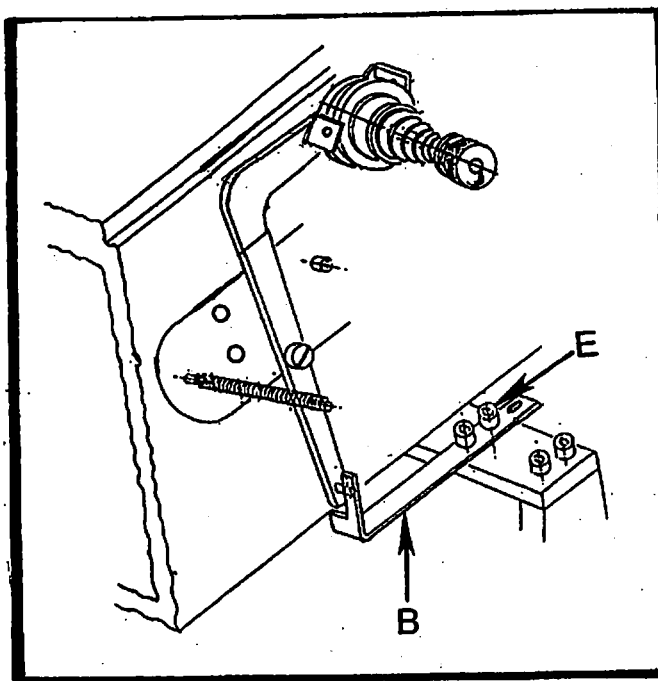
Tension bar (D) should just open the tension discs when the clamp table reaches the extreme backward position, and remain in that position until closed by the movement of the table starting its sewing cycle. Adjustment is made by loosening screws (C) and moving tension bar (D) up or down.



### NEW STYLE THREAD DRAW-OFF

#### STARTING THREAD

For more starting thread, loosen screws (E) and move actuator (B) backward; for less starting thread, move the actuator forward.



### THREAD LOOP SIZE

The proper size of the thread loop for average sewing conditions is just big enough for the looper to go into. Too large a loop may result in the loop turning over towards the front and the looper missing the loop causing skipping.

To adjust: Loosen set screw (A) and raise or lower loop wire (B) as required. Raising the looper wire increases loop size. Lowering the loop wire decreases loop size.

### NEEDLES TO THROAT PLATE

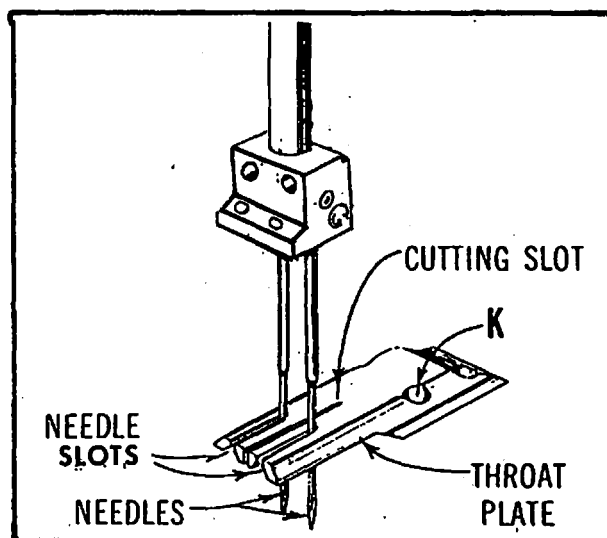
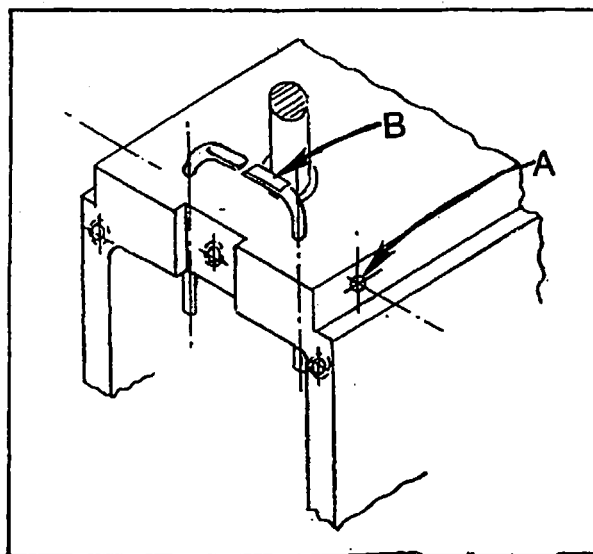
Throat plate should be positioned so that the needles enter the needle holes with clearance on both sides of the hole and a slight clearance at the rear.

To adjust:

With Clamp Table in its rear position, Clamp Safety Switch set to NORM, depress Pedal halfway to open Folding Brushes and set Selector Switch to ELEC. This will leave Folding Brushes open, allowing for removal of the Patch Guide. Manually operate sewing\* and observe Needles in the Throat Plate holes. If adjustment is required loosen screws (K) and tap the Throat Plate into the required position. Tighten all screws and replace Patch Guide.

\*In order to operate sewing manually, first remove wire from Normal Open pole of Patch Safety Switch and connect it to Normal Closed pole of same switch. Now, by pressing the knee switch, the Drive Shaft will be released, permitting manual sewing operation.

**IMPORTANT:** Be sure to return wire after adjustments are made and before returning to normal operation.



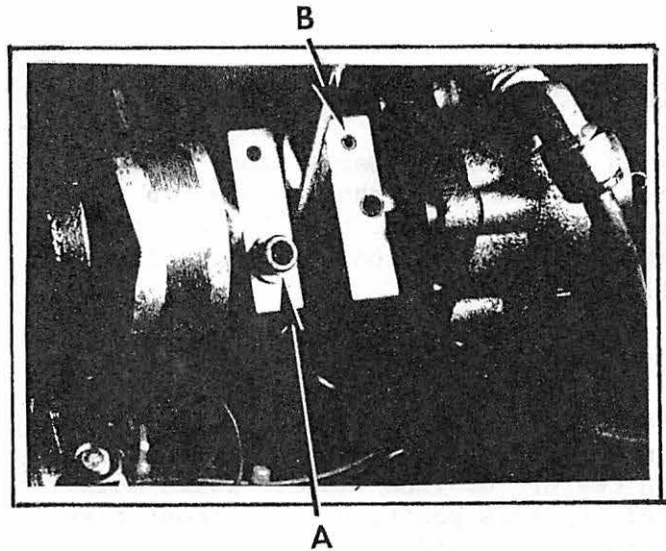
## NEEDLE AND LOOPER SYNCHRONIZATION

## Eccentric Setting:

The eccentric should be set such that when the Needle Bar is at the bottom of its stroke, the Looper assembly (loopers and holders) are at the maximum rearward position.

## To adjust:

Position Needle Bar at the bottom of its stroke. Loosen socket head cap screw (A) on the looper crank assembly (B). While preventing the Stop Motion V-belt drive from rotating, turn the looper crank assembly in a direction that will place the looper assembly at its maximum rearward position. Tighten screw.

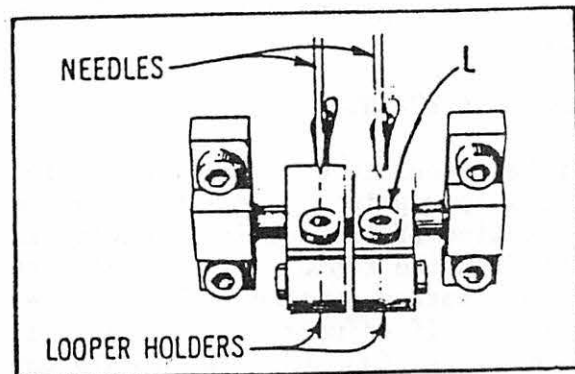


## LOOPER HOLDER ALIGNMENT

Looperr Holders should be positioned with the center of screws (L) in line with the Needles.

## To adjust:

Loosen screws (L) and position as required. See sketch.

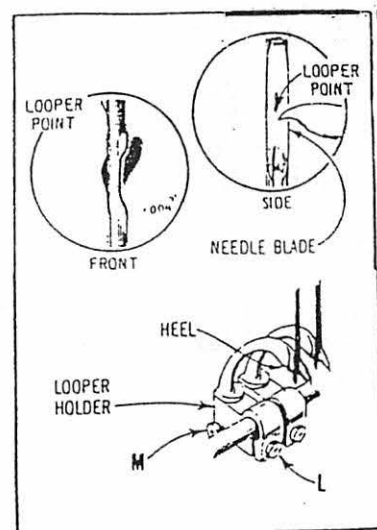


## LOOPER SETTING TO NEEDLE BLADE

When the Needle Bar has risen from the bottom of its stroke, the Looper points should be central with the Needle Blades and just clearing their sides.

## To adjust:

Rotate handwheel until the Looper points are central with the Needle Blades. Loosen screws (M) and adjust Loopers to just clear the inner sides of the Needles. Needles should pass as close as possible to the heel of Loopers without deflection.

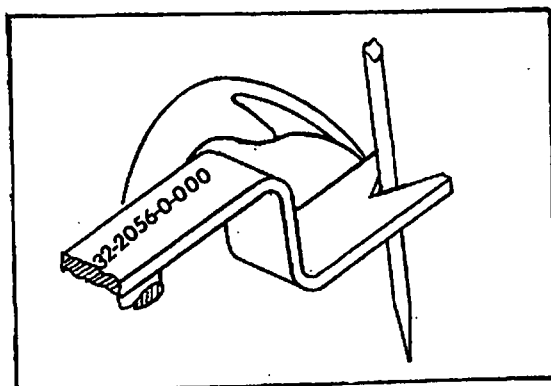


### LOOPER HOLDER SETTING TO NEEDLE

With the Needle Bar at the bottom of its stroke and the Loopers in their rearward position, the Looper points should be .100" from the centerline of the Needles.

To adjust:

Use Looper Gage (32-2056-0-000) to check clearance. NOTE: Needle goes in center of V on gage. While maintaining this position and without disturbing the sidewise location of the Looper Holders, loosen screw (L) and position Looper Points to the edge of the Looper gage by moving the Looper Holders.



### NEEDLE BAR HEIGHT SETTING

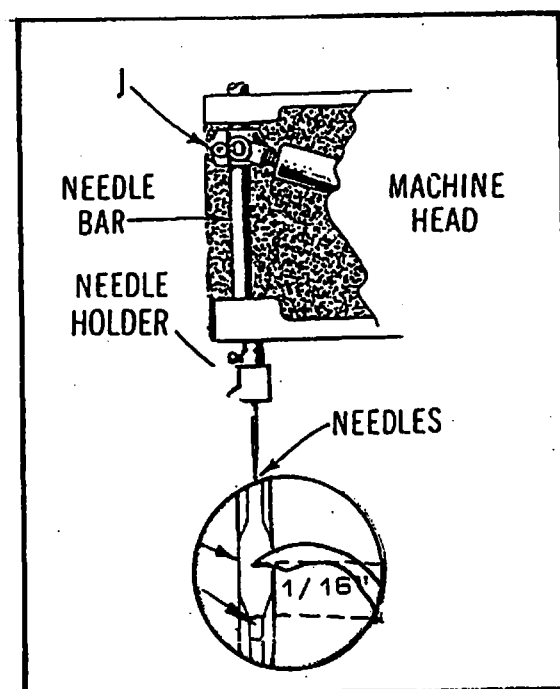
Turn handwheel in operating direction until looper point is in line with the center line of the needle. Setting is 1/16" from the top of the needle's eye and the bottom surface of Looper (see insert). If adjustment is required, loosen screw (J) and move needle bar carefully up or down. Check to see if the needles center in the needle holes or Throat Plate; retighten screw (J).

### LOOPER HEEL TO NEEDLE SETTING

As the needle passes by the heel of the looper on the up stroke and down stroke, it should pass as closely as possible to the heel within deflecting.

To Adjust:

Repeat eccentric setting procedure and looper holder setting to needle procedure.





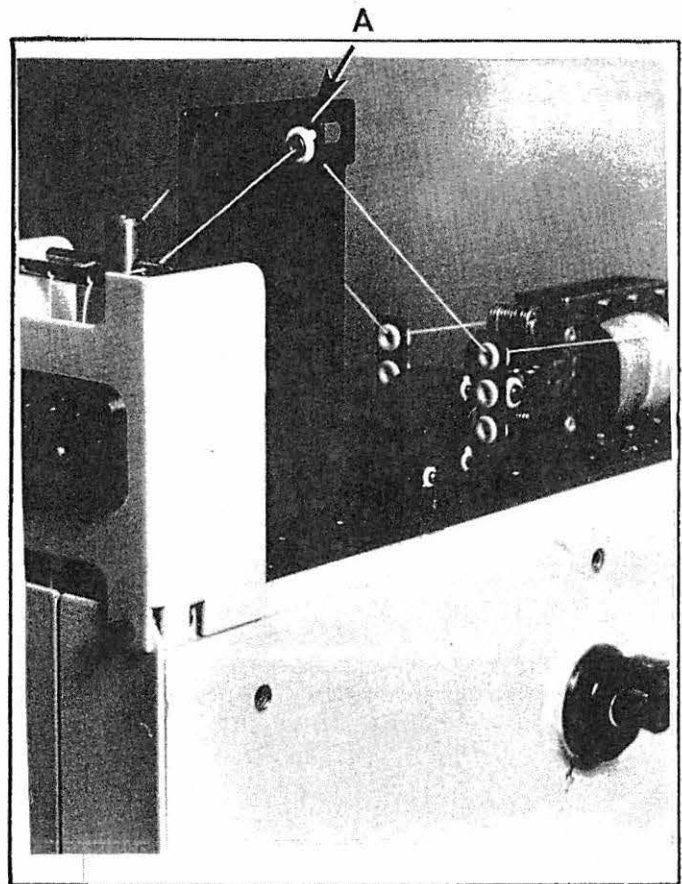
## ADJUSTING THREAD TAKE-UP EYELETS

The function of the eyelets (A) are to give a looser stitch or tighter stitch depending on the type of thread being used.

## To Adjust:

Loosen nut and move eyelet to the rear of the machine for a tighter stitch and forward for a looser stitch.

NOTE: It is recommended to set the thread tensions as loose as possible.





# A92      NOTES

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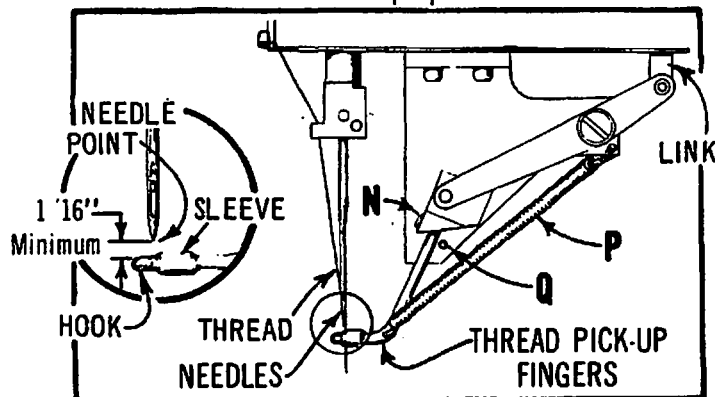
## THREAD PICK-UP FINGERS

When the Thread Pickup Solenoid is momentarily energized, the Pickup Fingers are designed to pass just beneath and just beyond the Needles, grasping the still taut thread before trimming occurs.

**TO ADJUST:** Press the Thread Pickup Solenoid plunger by finger pressure until it bottoms. The Thread Pickup Fingers should then be in a position shown in insert. Set screws (N) are provided to align the center of the hooks with the needle points.

Soft plastic Sleeves are installed over the Thread Pickup Fingers.

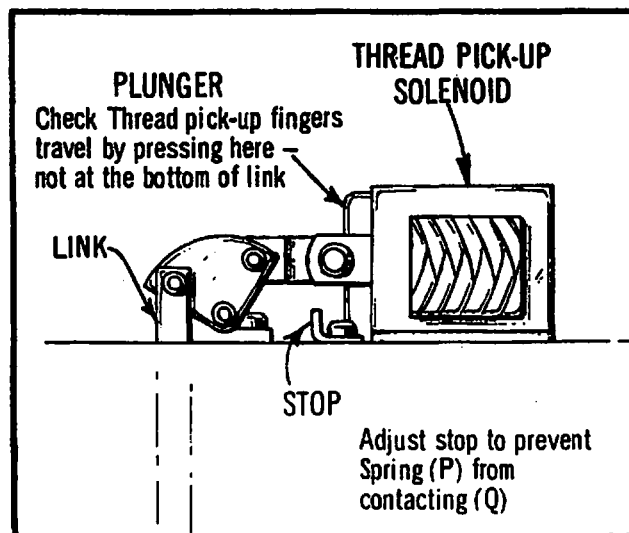
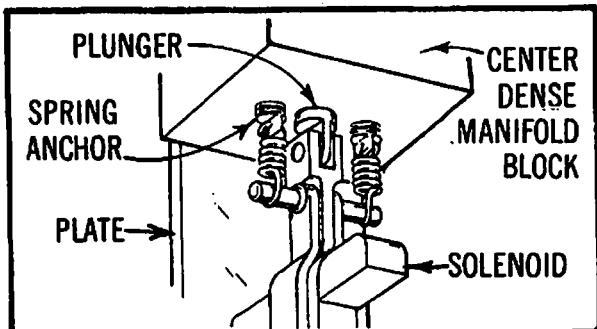
**TO ADJUST:** Move the Sleeve backward or forward to obtain the proper thread tension.



## TIMING CENTER DENSE SOLENOID

If the preceding adjustments are correct, but the Thread Pickup Fingers are operating after Thread is trimmed, check the Center Dense Solenoid. Plunger must return to "up" position very slowly.

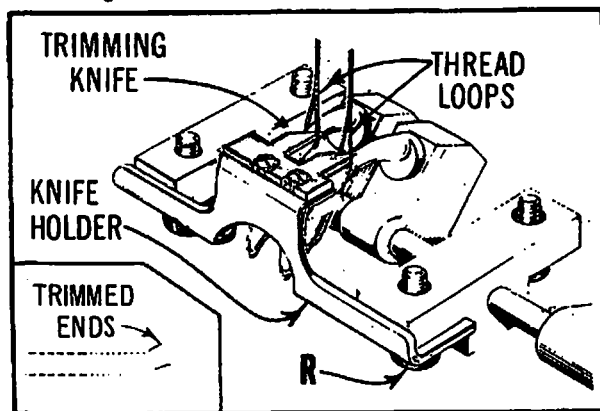
**TO ADJUST:** Back off Spring Anchors two full turns and recheck plunger action. If plunger still returns too quickly, air may be trapped in the Manifold Block. While the machine is actually sewing, loosen and quickly retighten the two screws holding Plate. Repeat this procedure until all air is bled from the system and the plunger "returns" slowly.



## THREAD TRIMMING

Thread Trimming takes place as the Clamp Table moves forward at the end of the sewing cycle. This movement brings the inside legs of the Thread Loops into contact with the Trimming Knife, cutting the thread as shown. The trimmed ends should be approximately 1/2" long as shown in insert.

**IMPORTANT:** Never operate with a dull knife that breaks the thread close to the last stitch as this may result in a raveling back of the stitching.



## SHARPENING TRIMMING KNIFE

Loosen screws (R) and remove Knife Holder and stone Trimming Knife to a keen edge, maintaining the bevel on the underside of the edge. (It is not necessary to remove Knife from Holder.) Reset the Knife Holder, keeping the Knife as close as possible to the Loopers without touching them and tighten screws (R) securely.

## ROCKER ROD TAKE UP

Take-up on Rocker Rods is accomplished by rotating the Front Shaft (Eccentric). Tighten rods by turning front shaft so that arrow moves toward the front of machine. Loosen rods by turning front shaft so that arrow points to rear.

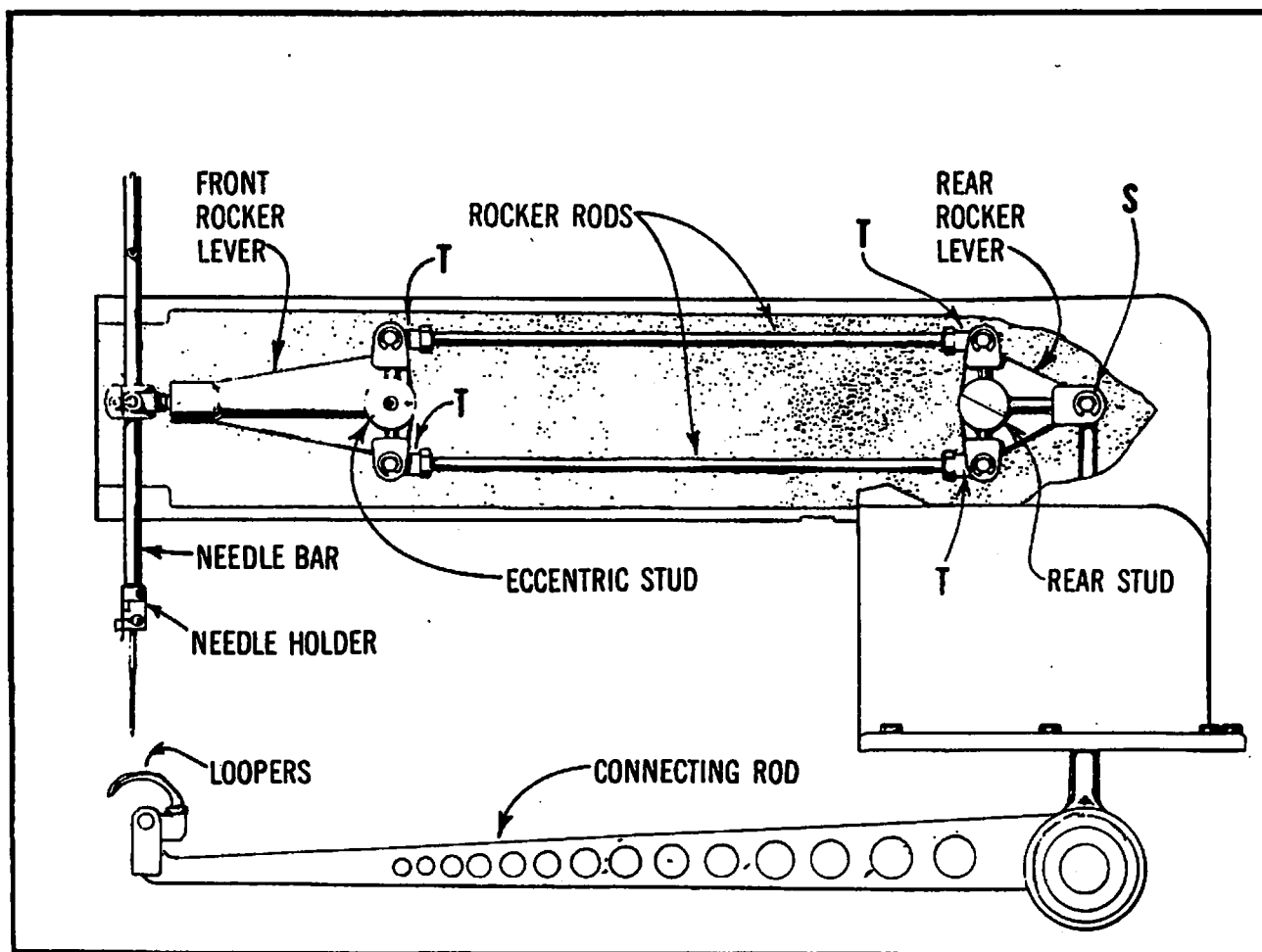
**TO ADJUST:** First remove the Needle Holder, Pin (S) and loosen nut on front shaft. Turn shaft toward rear of machine until Needle Bar moves up and down freely. Now move arrow toward the front until a slight dragging effect is obtained in the movement of the needle bar. Secure front shaft in this position. If arrow is turned entirely to its forward position, and this setting cannot be obtained, Rocker Rods will have to be readjusted or replaced.

## ROCKER ROD REPLACEMENT

While in most cases only one of the Rocker Rods will actually require replacement, change both Rocker Rods, accompanying connectors and nuts at the same time.

**TO ADJUST:** Turn arrow on Front Shaft to point toward rear of machine. Remove Needle Bar, Front Shaft, Rear Shaft and Pin (S). Be careful not to lose the small key in the Front Shaft. Withdraw the Rocker Rod assembly. Before disassembling, set new rods to exactly match old rod setting. Remove old rods from Front and Rear Rocker Levers and reassemble with the new Rocker Rods.

Reinstall Rocker Rod Assembly with arrow of Front Shaft pointing to the rear of machine. Adjust for Rocker Rod take-up as previously described.

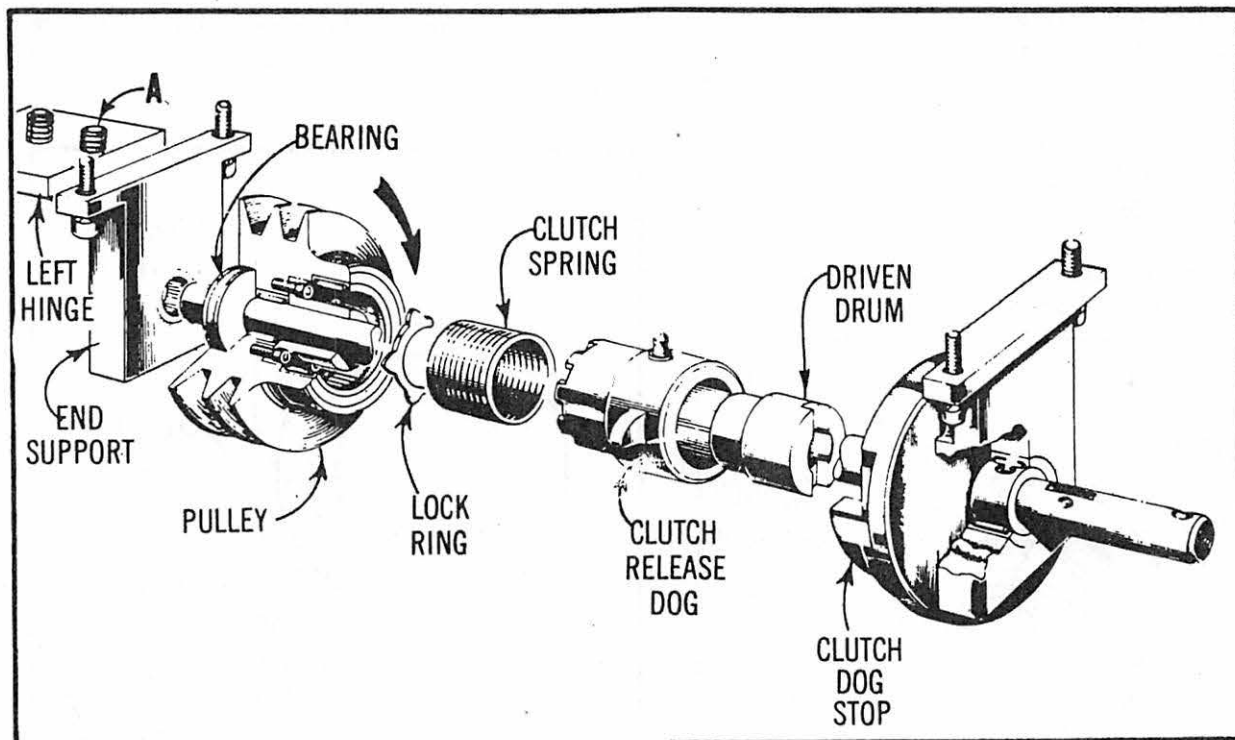


## REMOVAL OF CLUTCH SPRING

1. With machine in Stop position, remove Needle Holder and Upper Belts from Motor Pulley.
2. Remove screw (A) from Left Hinge, also remove End Support and Bearing. Then remove Pulley by turning it in direction of arrow while withdrawing Pulley.

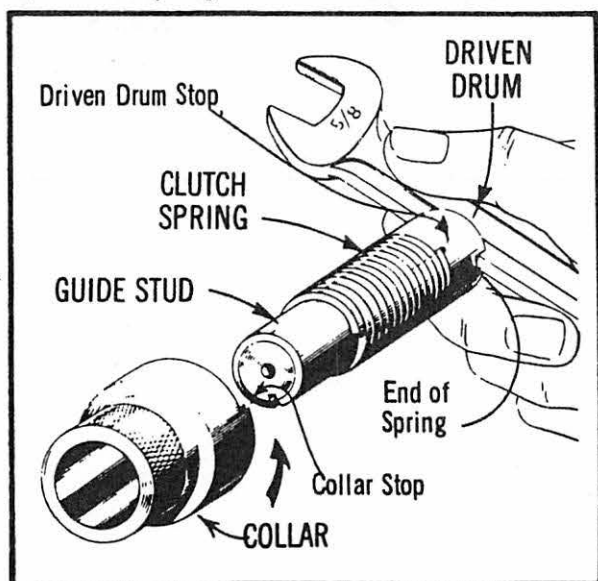
3. Unlatch Stop Motion.

4. Remove Lock Ring, Clutch Spring, Clutch release Dog, and Driven Drum. To remove Clutch Spring, it may be necessary to pry the Clutch Dog outward with a screwdriver inserted between the Clutch Release Dog and Clutch Dog Stop.



## INSTALLATION OF CLUTCH SPRING

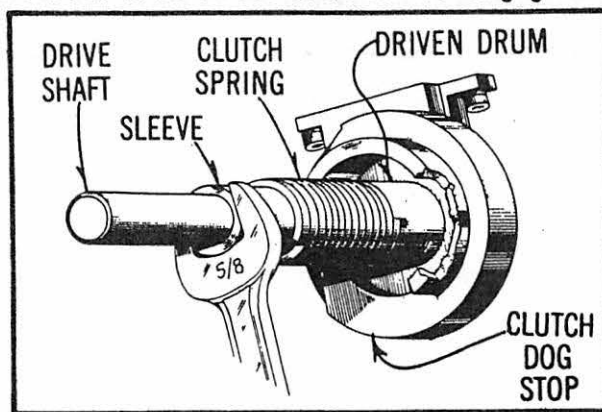
1. Start Spring on Guide Stud of Loading Tool. Then position Spring and Guide Stud in Collar of



Loading Tool with end of Spring engaged in the Collar Stop.

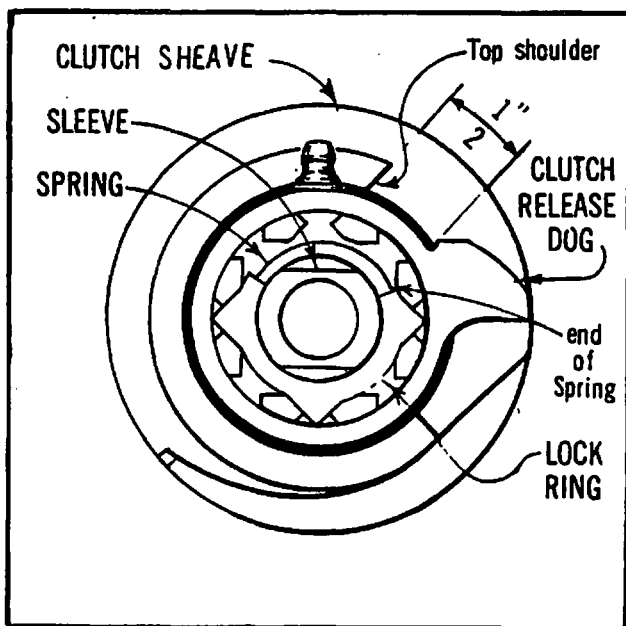
2. Start Spring on Driven Drum using the handle of a 5/8 inch wrench. Turn Collar in direction of arrow and press Spring toward Driven Drum until other end of Spring engages Driven Drum Stop.

3. Remove the Guide Stud and place the Spring and Driven Drum on the Drive Shaft. Engage the



Driven Drum in the Clutch Sheave. Insert the Sleeve of Loading Tool on Drive Shaft and start into Spring. Once started, hold Sleeve with 5/8 inch wrench while turning Drive Shaft by means of Handwheel until the Sleeve is fully engaged in the Spring.

4. Remove the assembled unit (Sleeve, Spring and Driven Drum) and install the Clutch Release Dog. Reinstall the assembled unit so that the Driven Drum is engaged in the Clutch Sheave and the end of the Spring faces toward you. Then position the Clutch Release Dog with the top of the Dog approximately 1/2 inch from the top shoulder of the Clutch Sheave. Seat the Spring by tapping it lightly with the small end of the loading tool Collar. Install the Lock Ring against the Spring so that it engages the splines of the Clutch Release Dog. Thick end of Ring is up against the end of Spring.



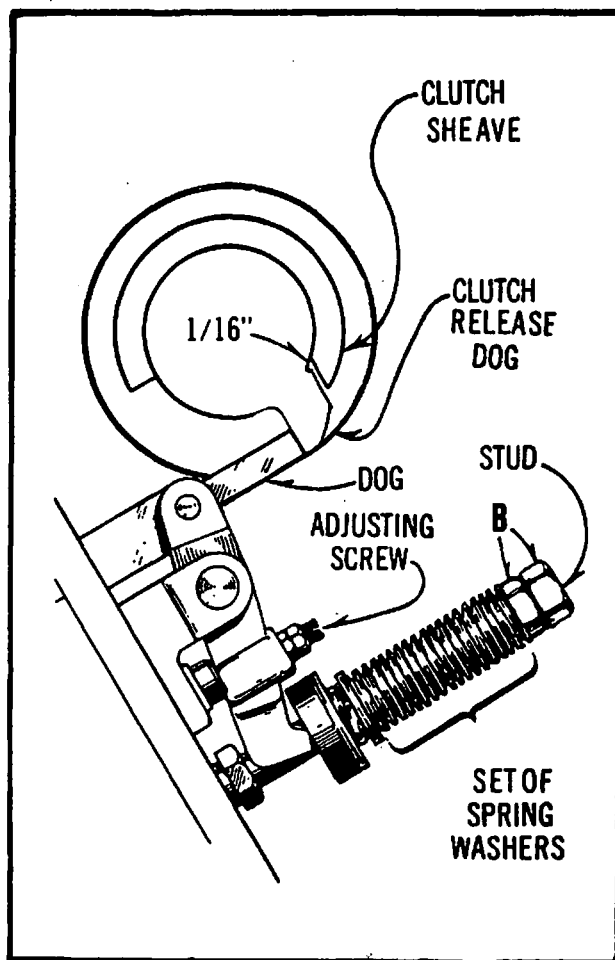
5. Holding the Lock Ring in place (use a 3/4 inch Wrench so that it bears against the two ends of Lock Ring), lock up machine and remove Sleeve of Loading Tool by turning it counterclockwise.

6. Replace Pulley slowly until contact is made, then snap it into place with pressure.

## STOP MOTION CLUTCH DOG ADJUSTMENTS

There should be approximately 1/16 inch clearance between the Clutch Release Dog and Clutch Dog Sheave.

**TO ADJUST:** With machine in Stop Position, turn Adjusting Screw until this 1/16 inch clearance is established. Tighten Nuts (B) together until the surface of the outer nut is flush with the end of Stud. This establishes the correct pressure on the set of Spring Washers.



## **TROUBLESHOOTING**

### **SEWING FAILS TO START OR STOP AT PROPER TIME**

Check Stop Motion adjustment, See page A96.  
Check Sew/Center Dense Circuit, See page A39.

### **GENERAL SKIPPING OR OTHER STITCHING TROUBLES**

Check Maintenance and Adjustments of Sewing  
Section, See pages A87 - A91.

### **OCCASIONAL SKIPPING**

Air in hydraulic lines may be causing erratic  
Clamp Table Travel. Clear air from hydraulic  
system by turning the Clamp Clearing Switch from  
FORWARD to BACK position several times. If air  
continues to build up excessively in the hydraulic  
system, check for oil leakage and eliminate any  
that exists. Also, check that hydraulic oil in  
pump is at the proper level.

Failure to lock the first stitch, when not related  
to incorrect sewing adjustment (see pages A87 -  
A91) may be caused by hesitation in the Clamp  
Table Travel Cylinder as it starts its forward  
motion. Refer to Clamp Table Travel Trouble-  
shooting (see pages A76 - A77) for causes and  
corrections of this condition.

### **LAST STITCH IS LONG INSTEAD OF SHORT**

If thread is breaking at the last stitch instead of  
being cut to proper length by the Trimming Knife,  
and sharpening does not correct the situation, use  
a stronger thread. Also, check that Thread Ten-  
sions are not excessive (See page A93).

### **LAST STITCH NOT PROPERLY LOCKED**

Check Stop Motion adjustment (See page A96).  
Check Timing Switch adjustment (See page A60).  
Make sure that Oil Check is functioning properly  
in the Center Dense Manifold Block.  
The function of this Oil Check is to slow the action  
of the plunger when returning to its "Up" position.



Normally, a center knife should be replaced approximately every 5000 pockets depending upon the material being cut. Within that period, the knife may require resharpener; this can be done by using a fine grade of oil stone. As the knife begins to dull, a pronounced pounding noise will be heard or a ragged center cut will be made. A supply of sharpened or new knives should be kept available for ready replacement.

To replace a center knife, first disconnect the air pressure; now loosen the two screws (A) which hold the center knife in place; at this time, raise the knife up through the throat plate, then down again. To replace a knife, place the knife up into the throat plate, then down between the clamp plate and the center knife holder, all the way to the stop screw.

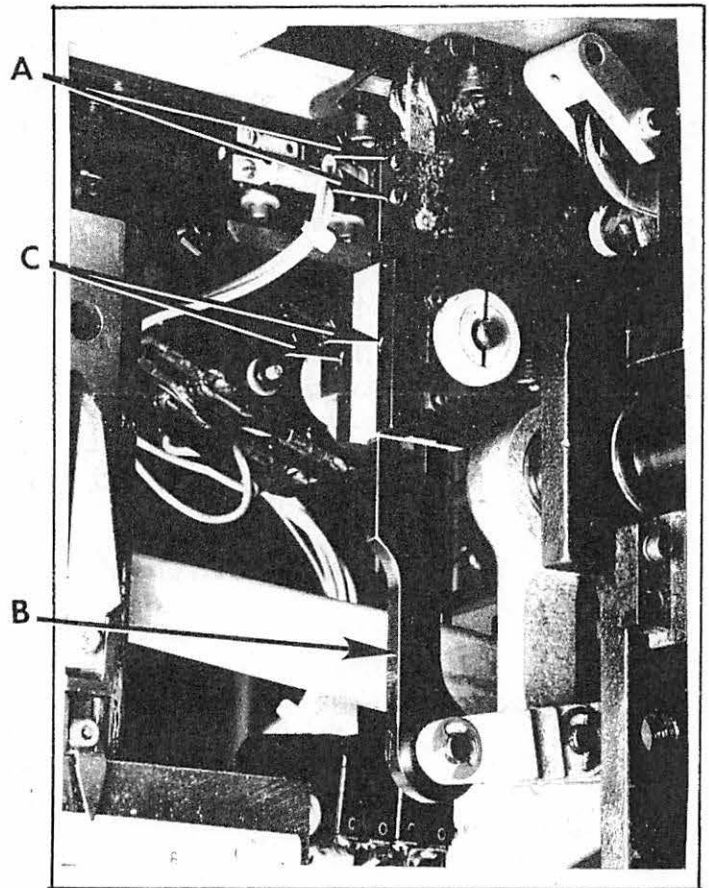
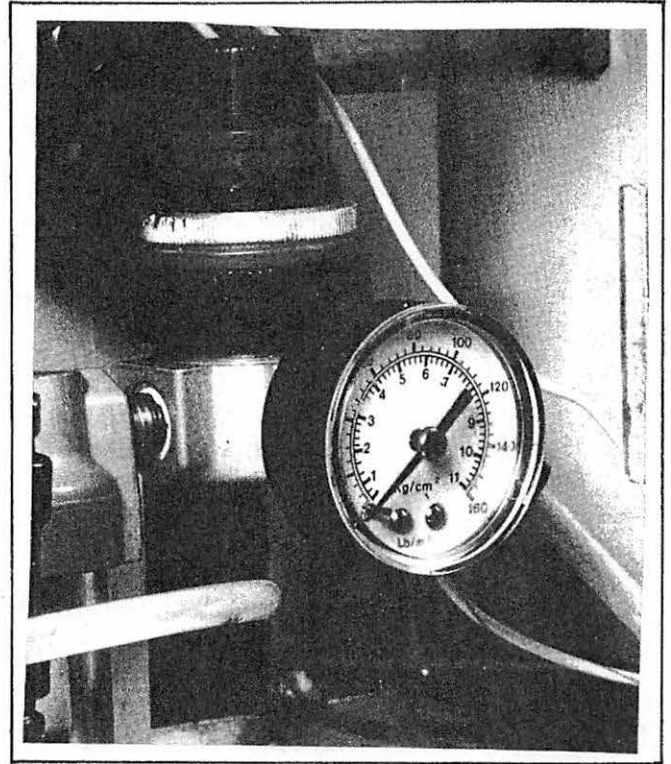
### CENTER KNIFE TO THROAT PLATE SETTING

While the air is still disconnected, push the knife holder (B) up so that the center knife passes up through the throat plate; it must not deflect more than .002" and must pass flush with the cutting edge of the throat plate. The cutting edge of the throat plate is the right side of the center slot when facing the machine.

To adjust:

With the clamp table in the rear position:

1. Manually move center knife up through throat plate.
2. Loosen set screws (C) on bearing blocks and adjust centerknife sideways until knife passes through the throat plate with no gap or deflection between knife and throat plate; tighten set screws (C). At this point, the center knife should be able to cut a single strand of thread.



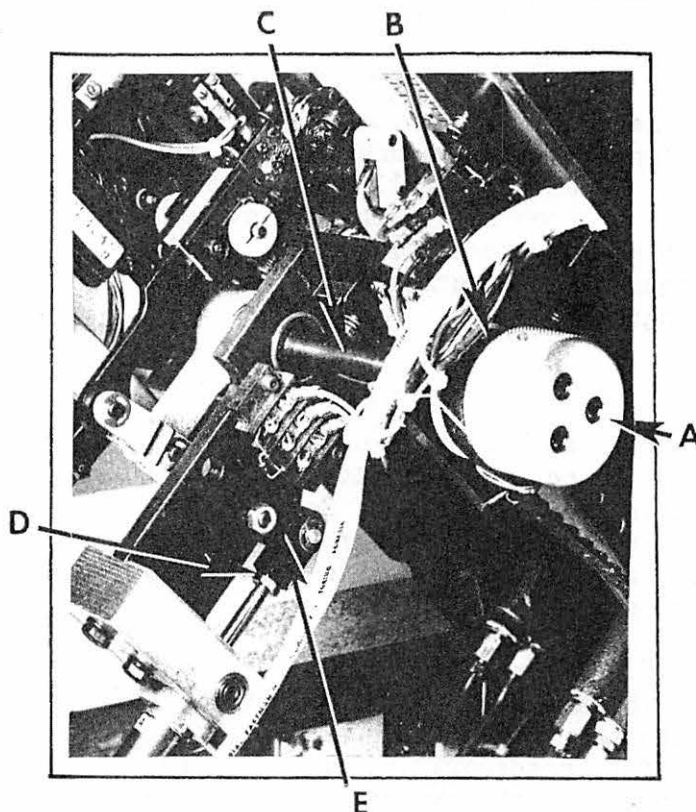


## CENTER KNIFE TIMING

The knife should be timed with the needle bar such that when the needle bar is coming down, the center knife is coming down.

To adjust:

With the clamp table in the rear position and the main switch pushed into OFF and the air supply is disconnected, remove the 3 screws on the handwheel (A) on knife drive shaft; now loosen the 2 screws on the drive pulley (B). You can now pull the drive pulley off the drive shaft (C), rotate the drive shaft in a position that the center knife is all the way up, ready to descend into the throat plate. Replace the drive pulley and belt, tighten the 2 set screws and replace handwheel and 3 screws.

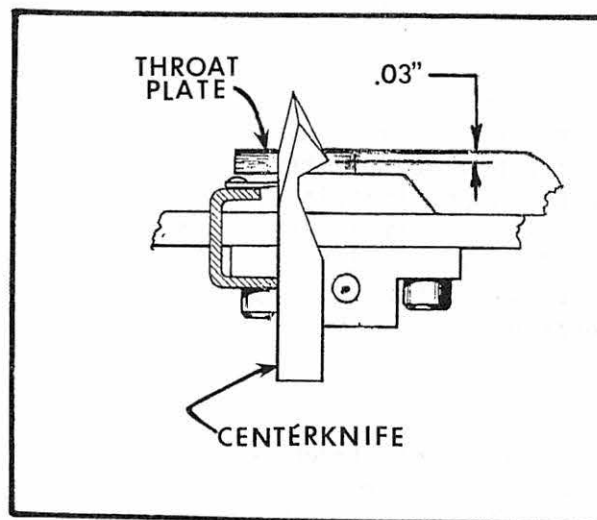


## CENTER KNIFE HEIGHT SETTING

When the center knife is in the cutting position, it should be adjusted so the knife point at the leading edge is  $1/32$  (.03") below the top surface of the throat plate at bottom of stroke. See sketch.

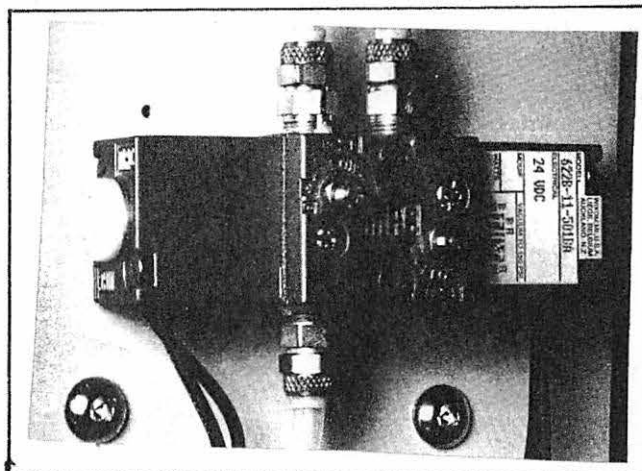
To adjust:

With the clamp table in the rear position and the power and air off, manually push knife holder up into cutting position; at this time, push the start/stop solenoid link up to engage the machine. Now rotate the handwheel until centerknife is at the bottom of its stroke; loosen hex nut (D) on air cylinder rod clevis and screw rod into clevis (E) to raise the knife and out to lower knife.



## CENTER KNIFE FINISH CUT

This adjustment should be made prior to setting the center knife startcut. The center cut should stop cutting approximately  $3/16$ " before the end of sew. The finish end dense limit switch fires the solenoid valve; this valve is located on the right side of the machine behind the second panel.





### CENTER KNIFE FINISH CUT (Cont'd)

As soon as end dense switch is fired, the solenoid valve sends air to the cylinder and this pulls the center knife down from its cutting position. Once this adjustment is made, it will not require re-adjustment when changing welt lengths.

To adjust:

Loosen the socket head cap screws (A) holding the centerknife pivot block (B) and slide it towards the front of the machine to decrease center cut length and towards the rear of the machine to increase center cut length.

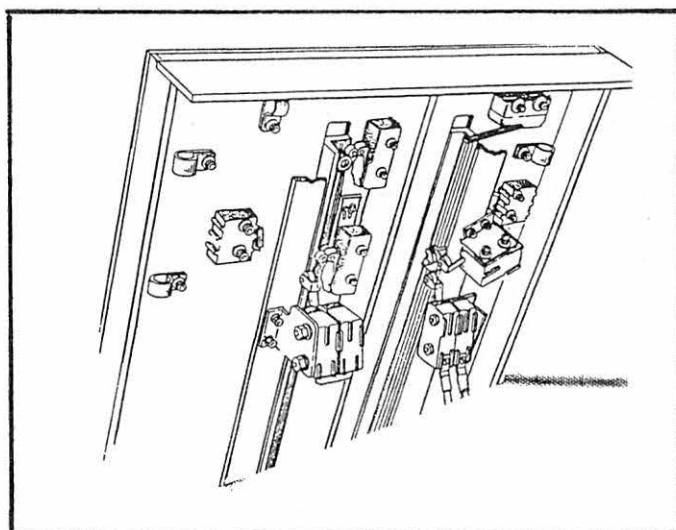
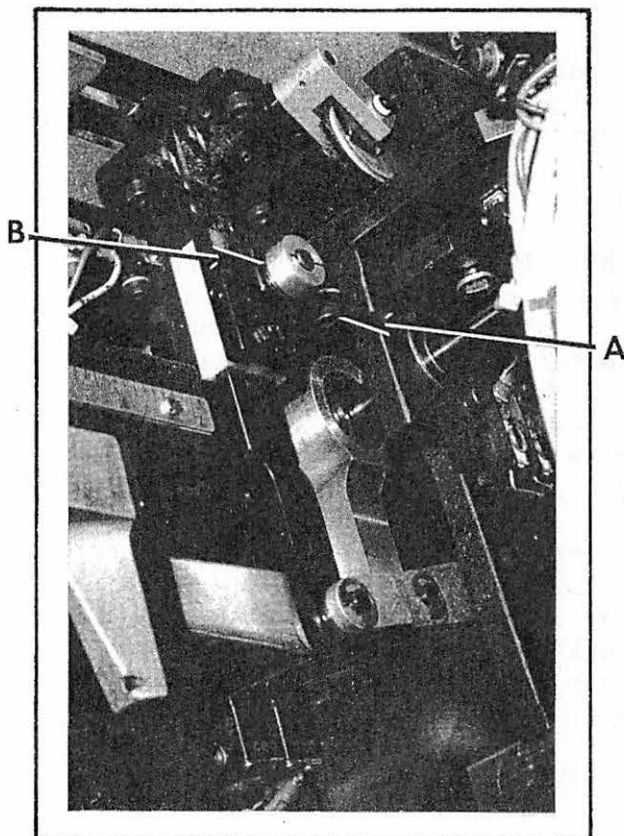
"Caution": Positioning the pivot block too far forward may result in interference with the thread trim bracket. It may become necessary to readjust the centerknife to the throat plate if the above adjustment is made.

### CENTERKNIFE START CUT

This adjustment is made after setting the finish cut position. The center cut should start approximately  $3/16$ " after sew. The Knife UP limit switch fires the solenoid valve which drives the knife up through the material into cutting position.

To adjust:

Loosen the two socket head cap screws (C) that hold the knife up limit switch (D) to the bedplate. Sliding switch towards front of the machine increases center cut length and towards the rear of the machine decreases center cut. NOTE: Keep bracket/switch lined up with the inner edge of the bedplate to assure proper contact with the actuator.



# TAB CUTTING

Tab Cutting is hydraulically operated and electrically controlled by the Fingers Switch of the Control Panel as follows:

## SEMI-AUTOMATIC (SEMI) POSITION

When the Clamp Table reaches its forward position, pressing Knee Switch closes the tab knife Circuit to energize the Solenoid.

This raises the plunger in the Manifold Valve Block, directing hydraulic fluid from the Pump to the bottom of the Tab Knife Cylinder, moving the Tab Knives up.

When the piston reaches the top of its stroke, the circuit automatically de-energizes the Solenoid. This lowers the plunger of the Manifold Valve Block, which in turn directs hydraulic fluid to the top of

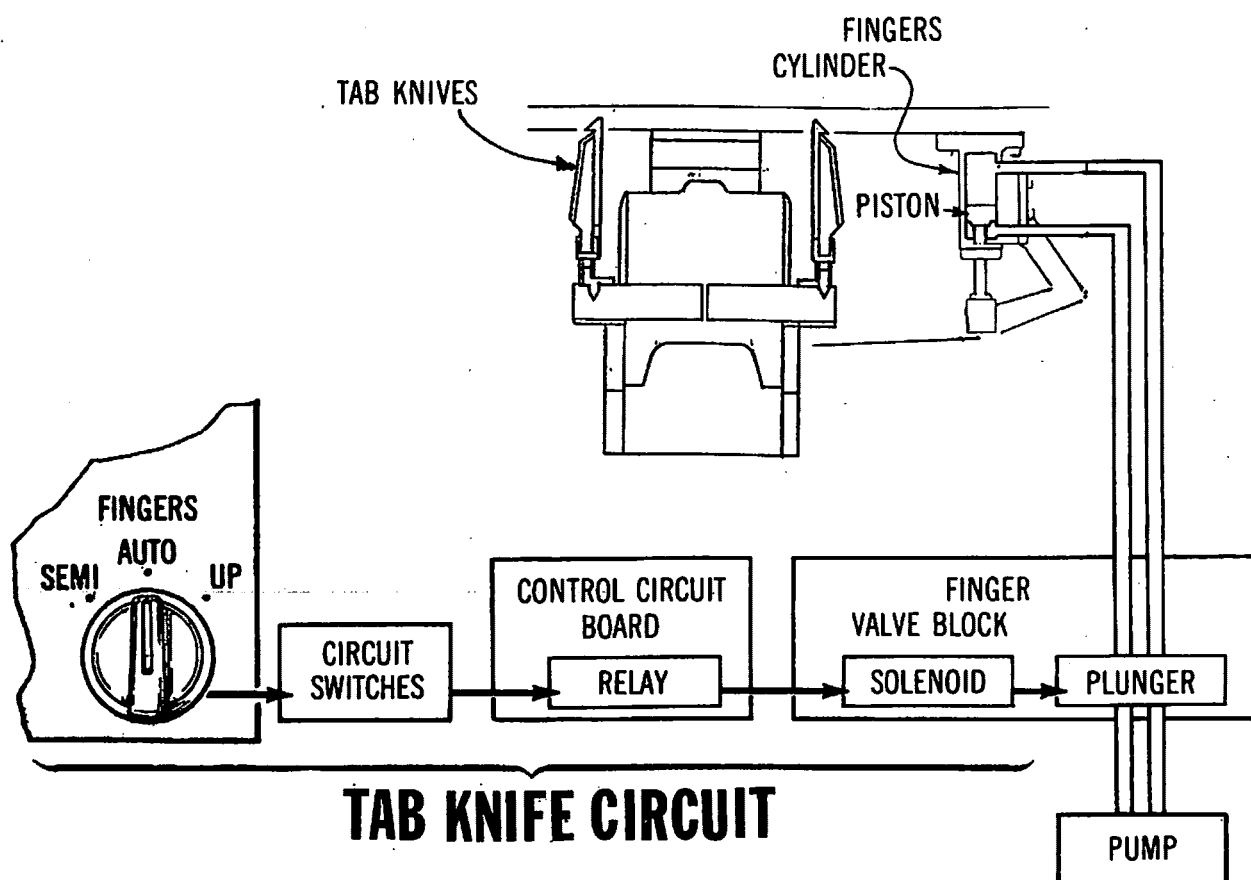
the Tab Knife Cylinder, moving the piston down.

## AUTOMATIC (AUTO) POSITION

When the Clamp Table reaches forward position, the circuit automatically energizes the Solenoid to operate the Fingers the same as described for Semi-Automatic.

## FINGERS REMAIN UP (UP) POSITION

This position is provided for changing the Tab Knives. Operation is the same as Semi-Automatic Position, except that Fingers will remain Up as long as the Fingers Switch is set at the "Up" position.





## MAINTENANCE AND ADJUSTMENTS

Tab Knives may be operated manually by releasing hydraulic pressure to Tab Knives Cylinder. First, bring Clamp Table to its "all the way forward" position and then set Selector Switch to its "E" (Electric only) position. Tab Knives may now be operated manually.

**IMPORTANT:** Clamp Table must be kept in its "all the way forward" position when manually operating the Tab Knives. Clamp Table has a tendency to slide back as the Tab Knives are being manually operated. This could trap the Tab Knives in the Up position. To prevent this, Clamp Table must be manually or otherwise kept from sliding back. A convenient way to assure that Clamp Table does not move is to place the 11/16 inch by 3/4 inch open end wrench (03-0086) between the Machine Head and Clamp Table, when the Clamp Table is all the way forward.

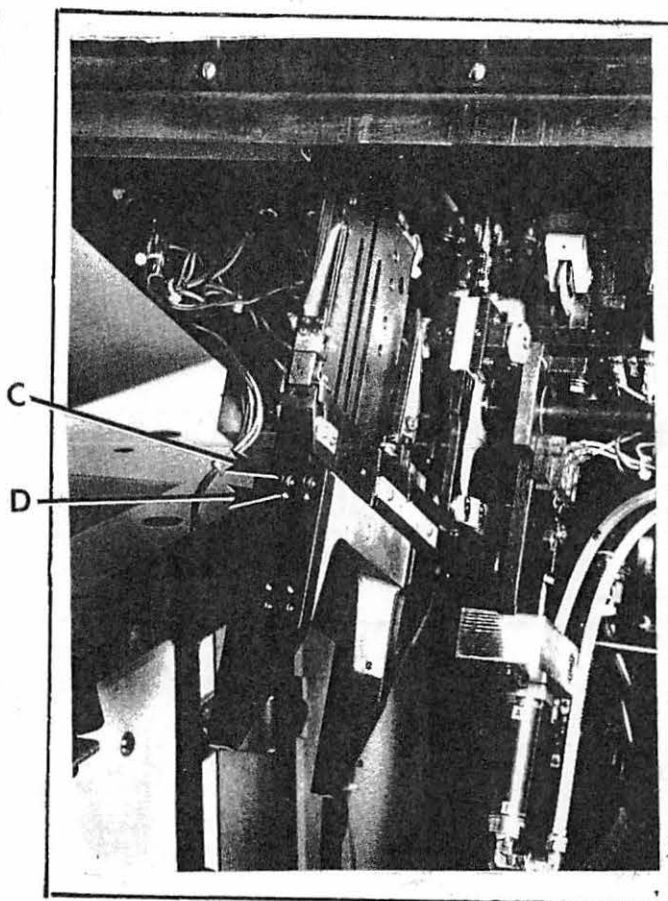
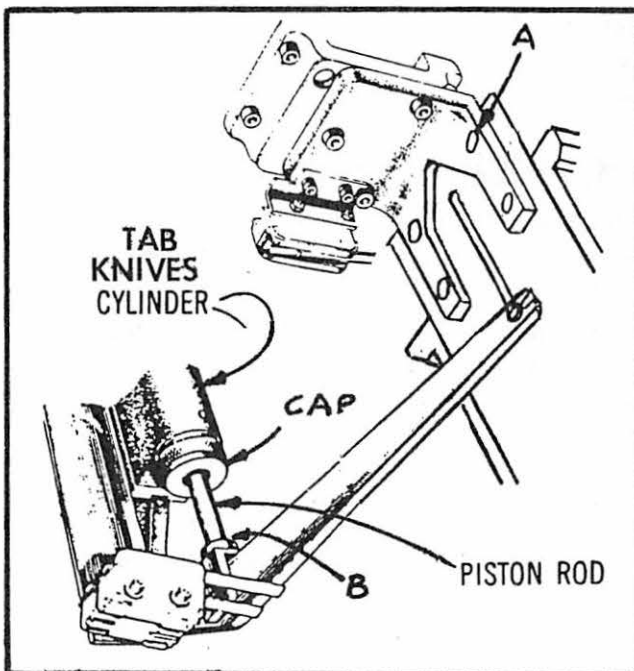
To remove the entire Tab Knife Mechanism without disturbing the existing setting, remove screws (A).

Tab Cutting should be accurately centered with respect to the two rows of stitches and the center cut. To establish and maintain this position, adjustments should be made in the following order:

### PLAY IN TAB KNIVES ASSEMBLY

Tab Knives should operate with minimum side or end play.

**TO ADJUST:** Loosen screws (C) and back off screws (D) about 1/8 inch turn. Then retighten screws (C) and check for play. Repeat this adjustment until play is eliminated without binding the movement of the Tab Knives. If side play remains after end play has been eliminated, replace Guide Plates and any other worn parts.



## CLAMPING MATS

Inner edges of Clamping Mats must be parallel and equidistant from the sides of the Throat Plate. For thin material the mats should just clear the sides of the Throat Plate. For heavier materials, the mats should be set further apart.

To Adjust:

Loosen screws (E) and set the Clamping Mats the required distance from the Throat Plate.

## CENTERING OF TAB KNIFE ASSEMBLY

Lower ends of Tab Knives should be centrally located between the Clamping Mats when the Tab Knives are at their top stroke.

To Adjust:

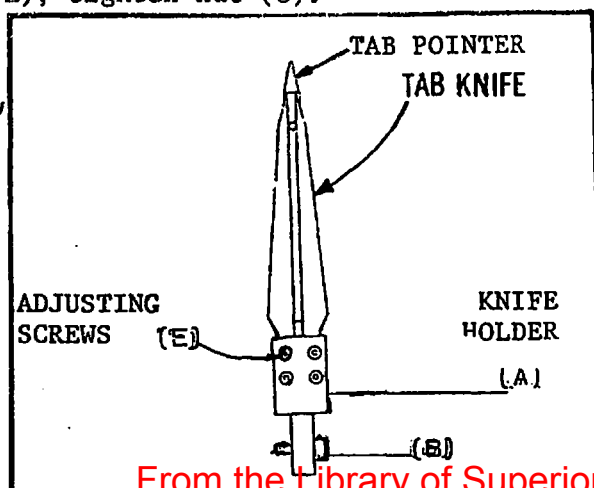
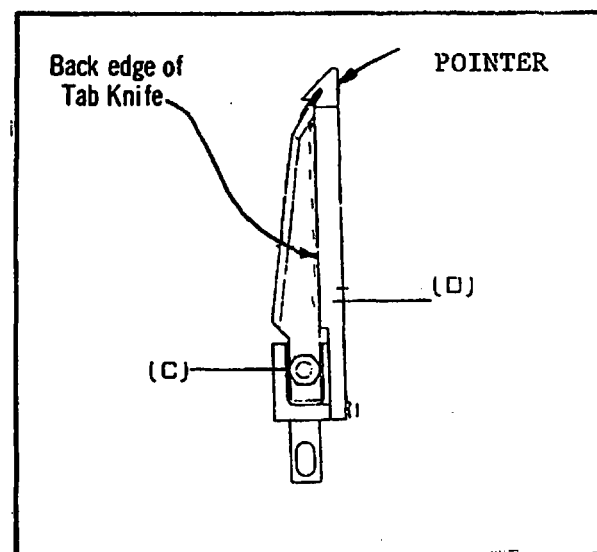
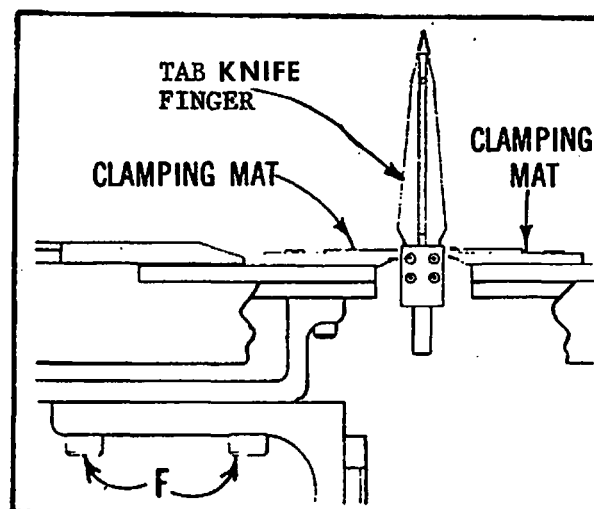
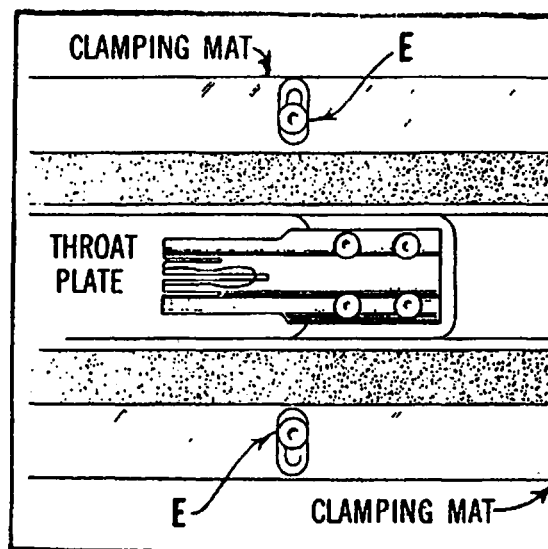
Loosen screws (F) and position Tab Knife Assembly as required.

## INSTALLING NEW TAB KNIVES

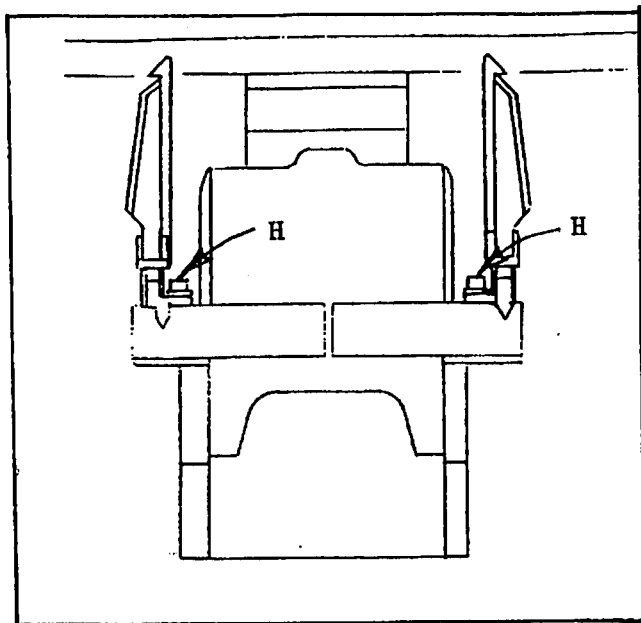
Remove Knife Holder (A) by removing screw (B). Remove Nut and Washer (C).

To install new knives, tilt knife up into the Knife Pointer (D) and down over the threaded screw; replace washer and nut.

After sewing and cutting, a check should be made to ensure that the Tab Knives are central to the two rows of stitching; if fine tuning is required, loosen nut (C) and adjust set screws (E); tighten nut (C).



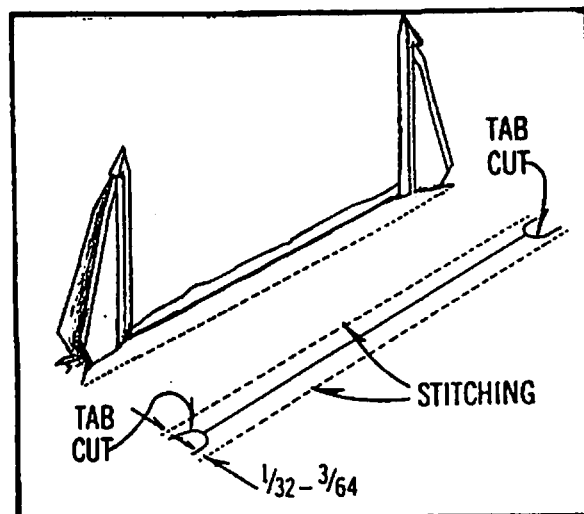




### HORIZONTAL ADJUSTMENTS

Front and rear Tab Knives should be positioned so that Tab Cuts are exactly even with ends of stitching and also equidistant from sides of stitching. Side clearance between Tab Knives and stitching must be  $\frac{1}{32}$  inch to  $\frac{3}{64}$  inch.

**TO ADJUST:** Sew test pattern on firm fabric without patch material to show location of knife cuts. Endwise adjustments of Tab Knives are made by means of screws (H). Sidewise adjustments are made by means of screws (F) (Shown on previous page).



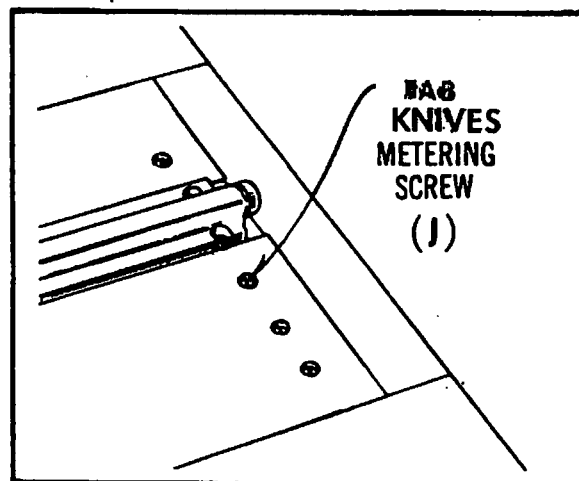
### 6. TEST ON PRODUCTION MATERIAL

The preceding adjustments are standard for most fabrics and materials. If materials are very thin, slippery or stretchy, compensating adjustments may be needed as covered in the Trouble Shooting section.

### 7. TAB KNIVES SPEED ADJUSTMENT

Tab Knives may operate at any reasonable speed that does not jar or strain the mechanism.

**TO ADJUST:** Turn Tab Knives Metering Screw outward for faster speed, or inward for slower speed.



## TROUBLESHOOTING

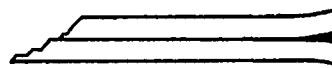
### TAB KNIVES FAIL TO OPERATE

Check for mechanical obstructions or binding in Tab Knife Assembly.

Back off and readjust Metering Screw (J).

Check Tab Knife Circuit.

### CORNERS OF WELTS OPEN



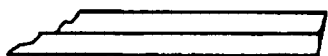
Tab Knives cutting too far. Adjust Knives.

### KNIVES STICK ON DOWN STROKE

Clamping Mats set too close, causing material to clog and tear at the corners. Readjust as required.

If Tab Knives lack power, replace all "O" Rings in Tab Knife Cylinder Assembly.

### ENDS OF WELTS NOT SQUARE



Tab Knives dull or unevenly positioned. Replace Knives, setting back edges flush with back surfaces of Knives.

Rows of stitching uneven at ends. Check that needles are straight and that there is no skipping of stitches when the sewing starts.

Knives bent or not properly centered. Readjust as required.

### SHORT TABS

Tab Knives cutting too short. Replace Knives if dull. Otherwise, adjust positions of Knives.

Center cut too long. Adjust Center Knife.

### STITCHES SHOWING ON FRONT OF WELT

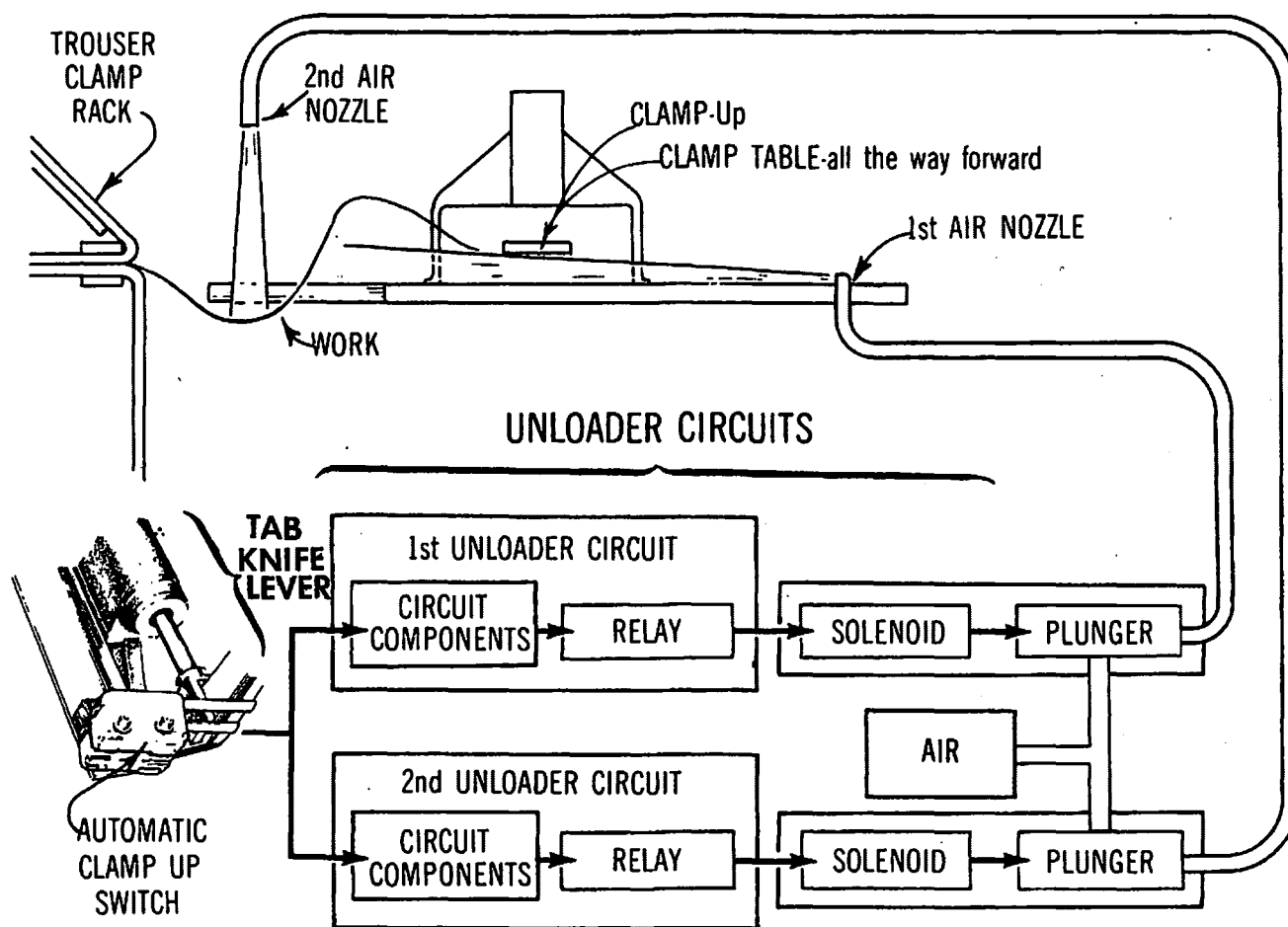
One stitch will be slightly exposed at each corner of the pocket welt, but side stitching should be well concealed. If not, tensions are too loose or Clamping Mats are set too close together. The thread should be approximately the same color as the garment material.



## UNLOADING

The Work Unloader consisting of two air nozzles, is designed to remove the work from under the clamp and onto the Trouser Clamp Rack at the completion of the welt. It is electrically controlled by two Unloader Circuits.

Set Loader Switch for "Auto Front, Auto Back or Manual Front" and the Finger Switch for "Auto". At the completion of the Welt (Clamp Table forward and Clamp up) the downward action of the Tab Knife Lever will close the Automatic Clamp Up Switch which in turn will activate the Unloader Circuits.



## MAINTENANCE AND ADJUSTMENTS

The Unloader requires an air supply of between 90 and 100 p.s.i.

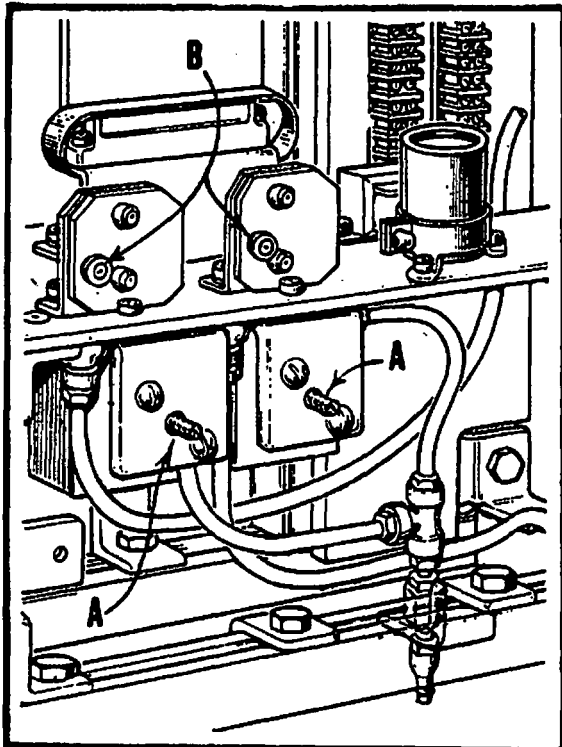
The two Unloader solenoids must be set for maximum air flow.

**TO ADJUST:** Turn screws (A) all the way out to obtain the greatest air flow. (Normally, once established, these settings need not be changed.)

The ideal condition for the air jets is to have them set for the shortest possible duration needed to carry the work away from the machine. Air remaining on after the work is removed, is unnecessary and only delays operator from starting the next welt.

Also, the second jet should be set to last slightly longer than the first jet. This is to assure that work will be completely carried onto the Trouser Clamp Rack.

**TO ADJUST:** Duration of air jets is set by turning adjusting slots (B) of potentiometers. Turning counterclockwise increases duration of air jets. Turning clockwise decreases the duration.



## TROUBLESHOOTING

### NO AIR PASSING THROUGH UNLOADER

Check Air Supply.

Check adjustments on Unloader solenoids.

Check that the Automatic Clamp Up switch is being actuated by the downward movement of the Tab Knife Lever.

### WORK NOT BEING COMPLETELY EJECTED

Check for mechanical obstructions.

Check solenoids for maximum air flow.

Check that Adjustable Potentiometers are set to provide sufficient time for air to eject work.

Check that Adjustable Potentiometers are set to allow Second Jet to remain on longer than First Jet.

### AIR JETS REMAINING ON TOO LONG

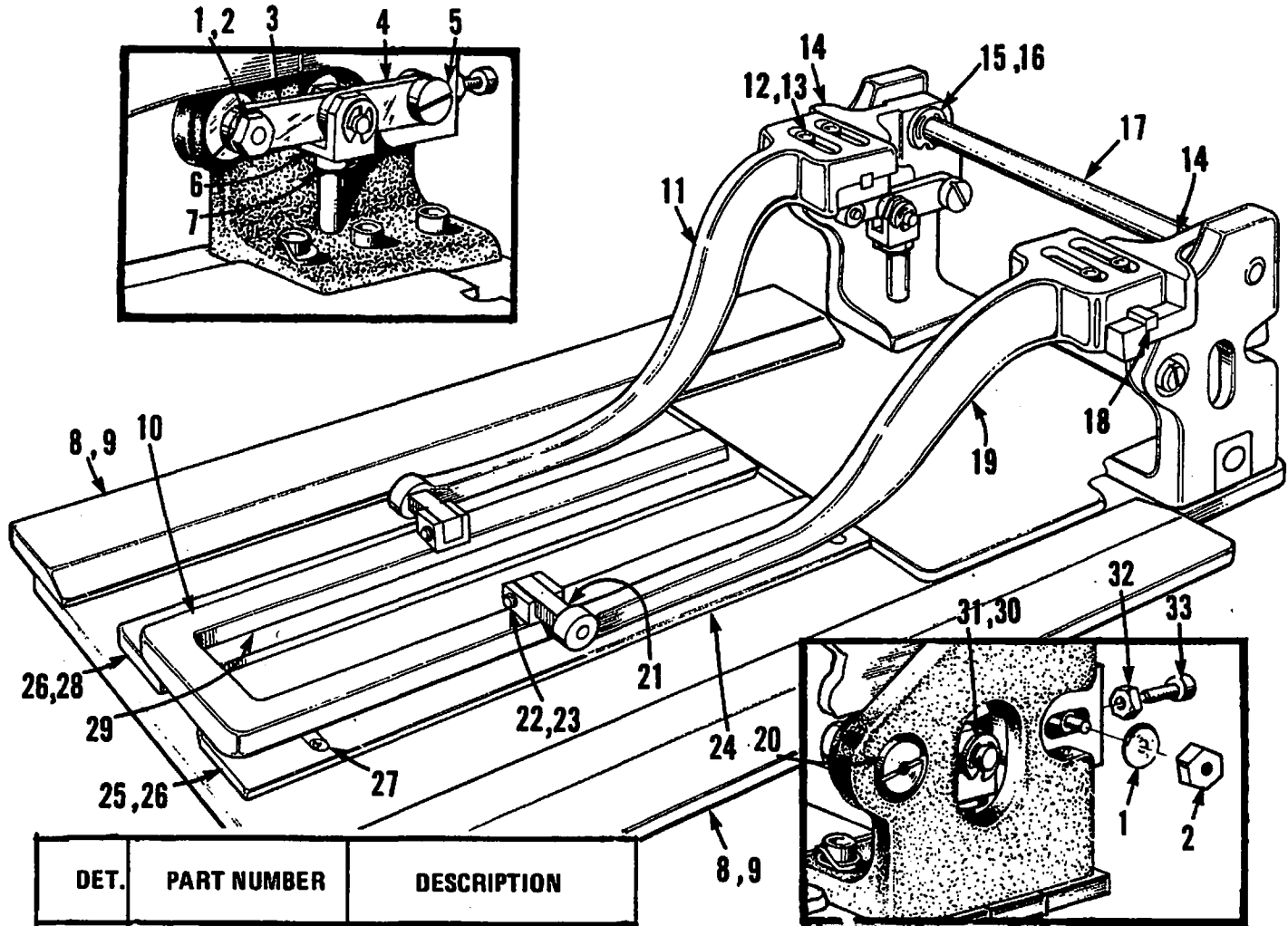
Check that Adjustable Potentiometers are set for shortest possible duration.



# ILLUSTRATED PARTS SECTION

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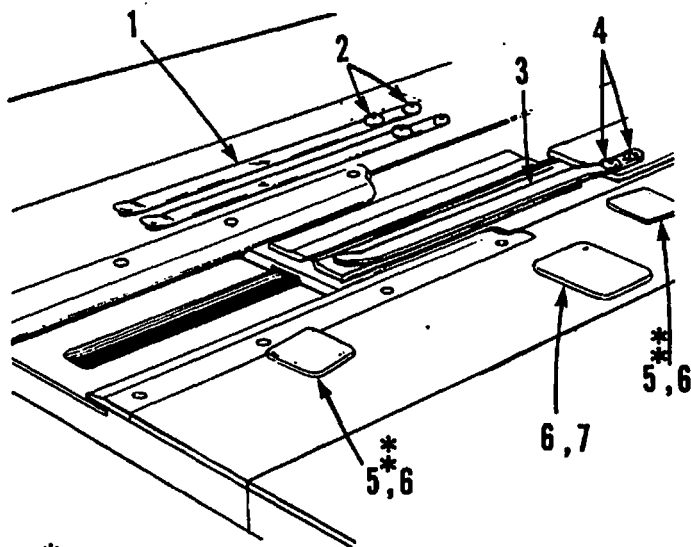
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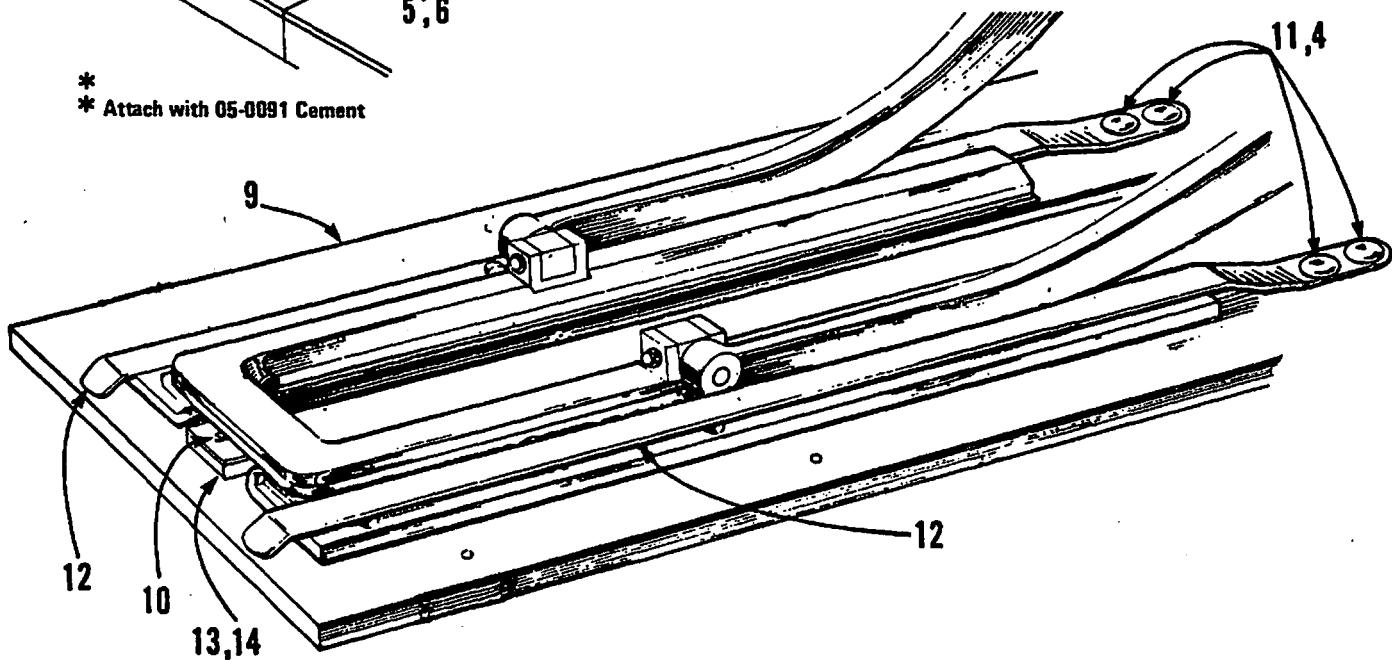
DET.	PART NUMBER	DESCRIPTION
01	01-3404	Nut
02	01-4441	Washer
03	40-0085	Lever
04	40-0079	Lever
05	01-1419	Screw
06	40-0087	Link
07	01-3415	Nut
08	40-0332-1	Slide Plate Cover (pair)
09	01-2451	Screw
10	see page 7	Clamp Foot
11	42-0071-0-004	Clamp Arm (left, front)
12	01-2447	Screw
13	01-4402	Washer
14	42-0071-0-007	Clamp Arm (Rear)
	32-2131	Clamp Arm (Right) Extra Wide Welt
	32-2132	Clamp Arm (Left) Extra Wide Welt
	42-0071-0-010	Clamp Arm Rear (Left) Narrow Welt
	42-0071-0-020	Clamp Arm Rear (Right) Extra Wide Welt

15	01-4484	Spacer
16	01-6561	Retaining Ring
17	41-0080	Slide Bar
18	01-7530	Key
19	42-0071-0-003	Clamp Arm (right, front)
20	01-1418	Screw
21	41-0072-0-002	Pivot Block
22	01-6477	Pin
23	01-6368	Retaining Ring
24	40-0676	Spacer (used with 1/2" support plate)
25	see page 7	Plate Cover
26	see page 7	Support Plate (R.H.)
27	01-2461	Screw
28	see page 7	Support Plate (L.H.)
29	see page 7	Sole
30	01-6489	Pin
31	01-6558	Retaining Ring
32	01-3402	Nut
33	01-2482	Screw

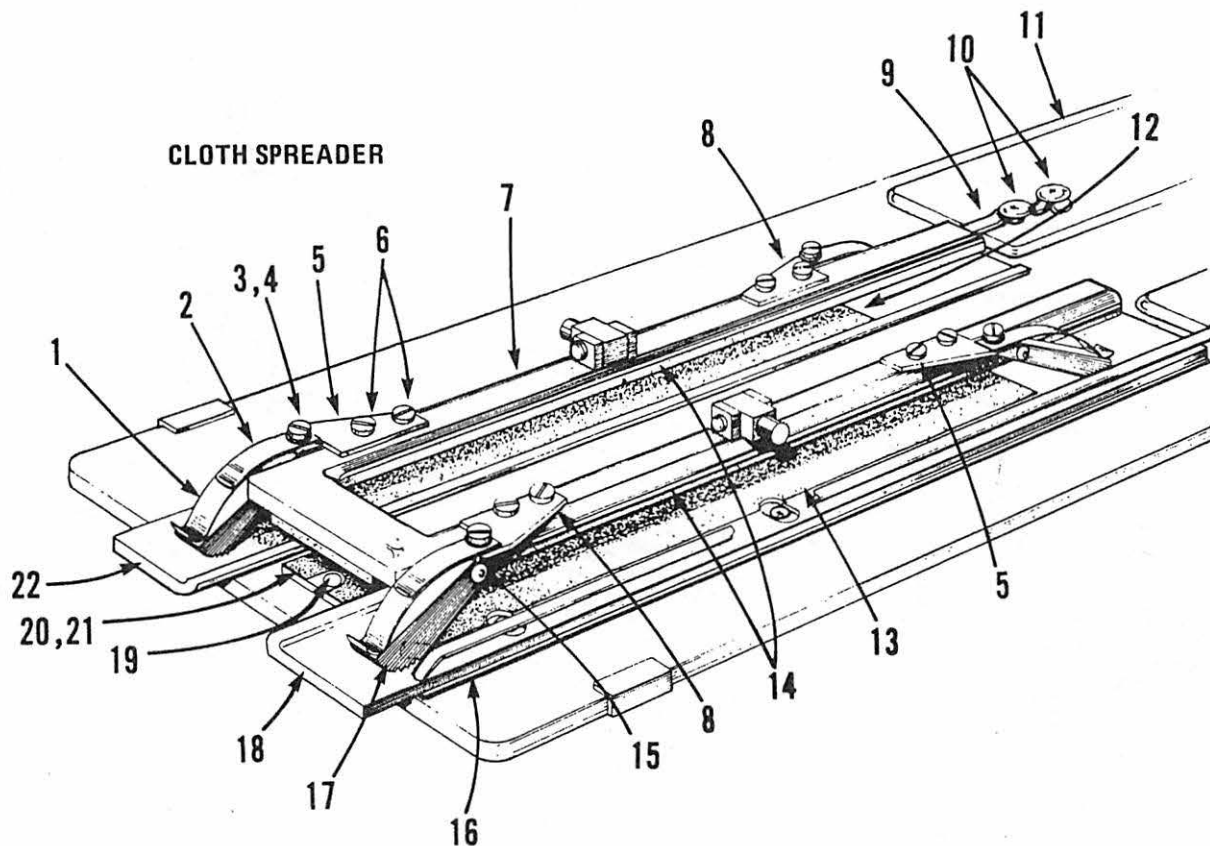
## TROUSER UNIT SETUP



\* Attach with 05-0091 Cement

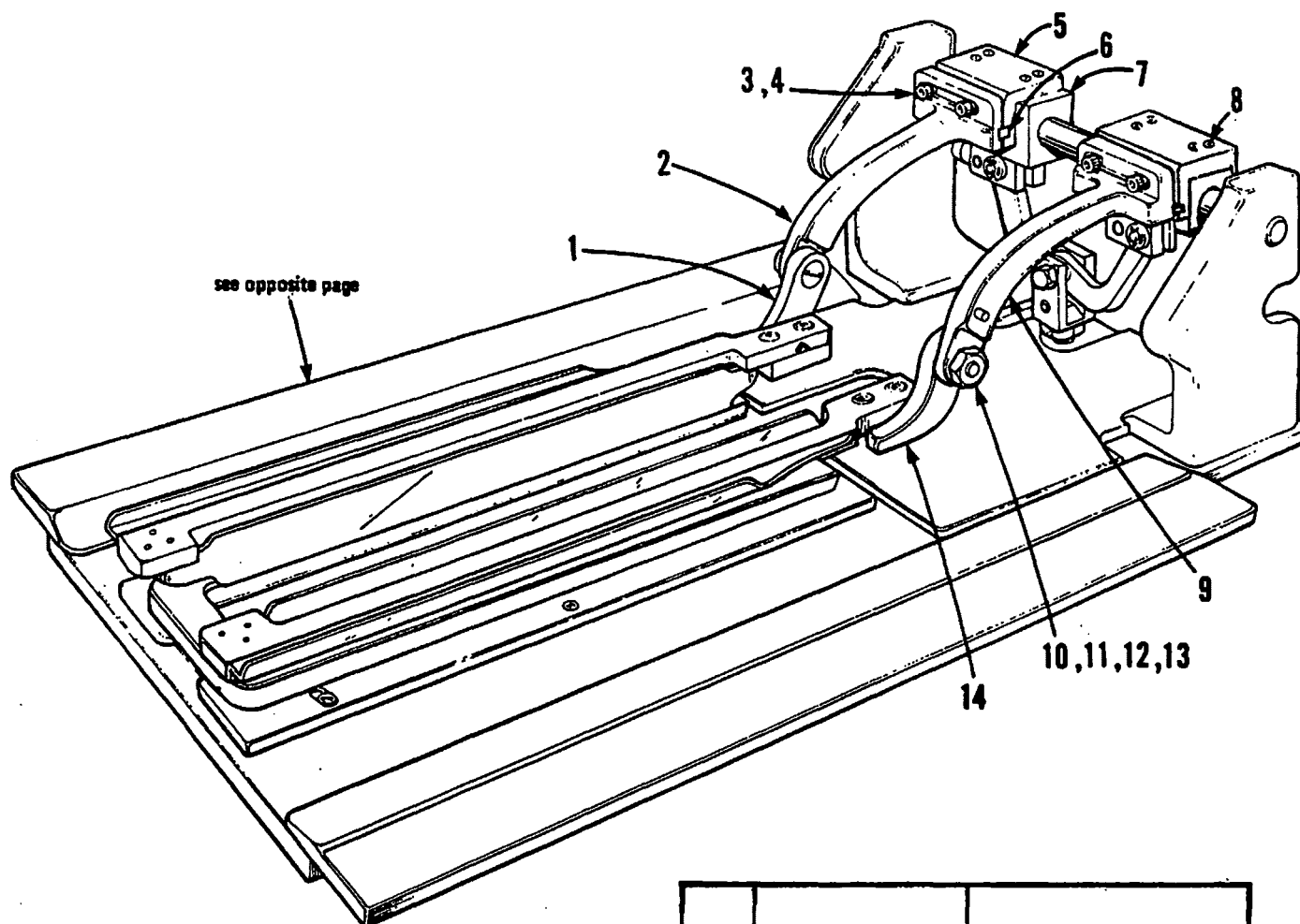


DET.	PART NUMBER	DESCRIPTION			
01	40-0596	Hold Down, Long	13	32-1025-0-050	Block Asm. (3/8"-7/16")
02	01-2536	Screw		32-1025-0-051	Block Asm. (1/2"-7/8")
03	40-0597	Hold Down	14	40-0717-2-375	Block Cover-Gray (3/8"-7/16")
04	01-2633	Screw		40-0717-2-500	Block Cover-Gray (1/2"-7/8")
05	40-0613	Gauge		32-2209	Block Cover-Antislip Black (3/8"-7/16")
06	05-0091	Contact Cement		32-2210	Block Cover-Antislip Black (1/2"-7/8")
07	40-0614	Gauge			
09	32-2110-0-050	Clamp Plate Asm.			
10	01-2523	Screw			
11	01-4489	Lockwasher			
12	40-0597	Hold Down			



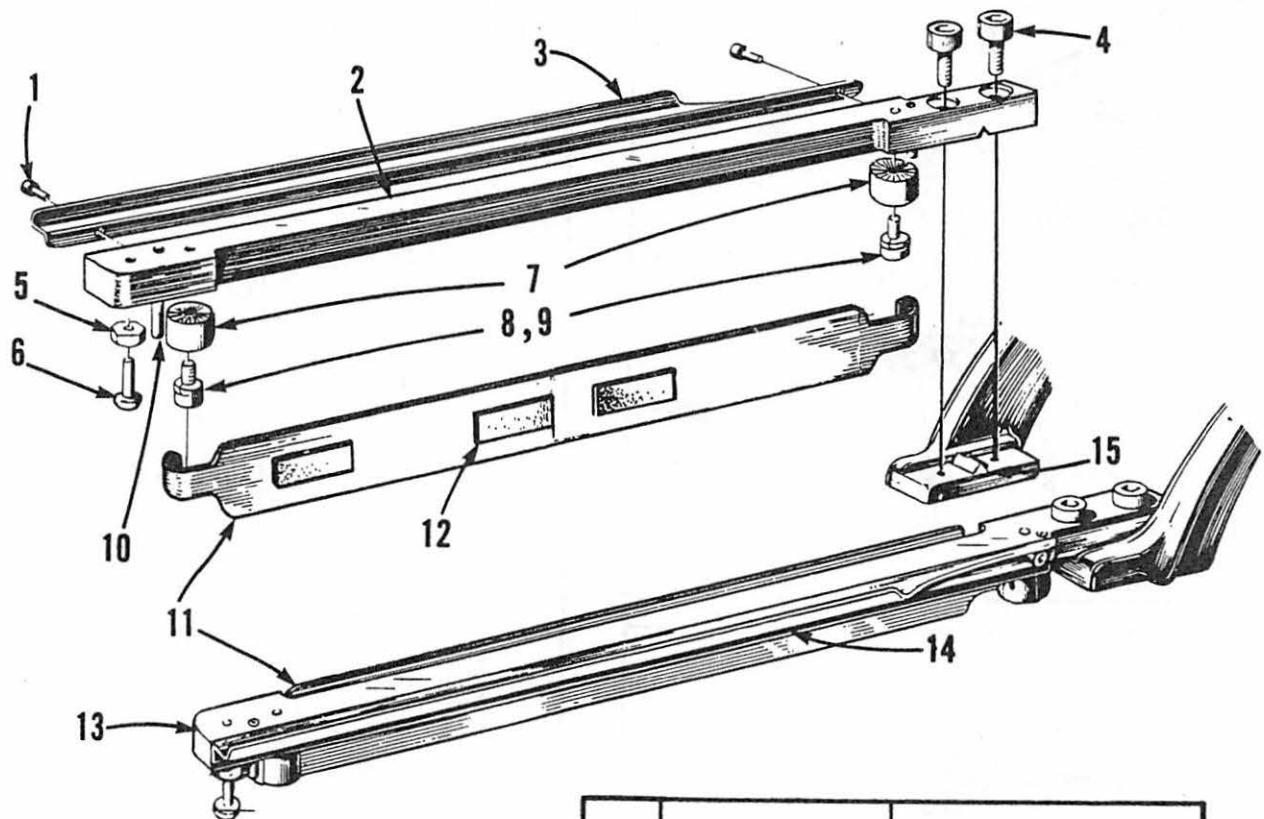
DET.	PART NUMBER	DESCRIPTION
01	01-5479	Spreader Spring
02	01-5480	Support Spring
03	01-2667	Screw
04	01-4494	Washer
05	40-0700-0-152	Foot Asm.
	40-0767-1-102	Spring Support
06	01-2597	Screw
07	see page 7	Clamp Foot
08	40-0700-0-151	Foot Asm.
	40-0767-1-101	Spring Support
09	40-0597	Hold Down
10	01-2545	Screw
11	41-0680	Stiffener Plate
12	see page 7	Plate Cover
13	see page 7	Plate Cover
14	see page 7	Sole
15	01-6519	Rollpin

16	40-0676	Spacer
17	40-0700-2-100	Spreader Foot
18	see page 7	Support Plate (R.H.)
19	01-2523	Screw
20	32-1025-0-375	Block (3/8"-7/16")
	32-1025-0-500	Block (1/2"-7/8")
21	40-0717-2-375	Block Cover (3/8"-7/16")
	40-0717-2-500	Block Cover (1/2"-7/8")
22	see page 7	Support Plate (L.H.)



DET.	PART NUMBER	DESCRIPTION			
01	42-0073-0-004	Brush Arm (Lower L.H.)	10	01-1486	Screw
02	42-0073-0-002	Brush Arm (Upper L.H.)	11	01-4044	Washer
	42-0073-0-010	Brush Arm Extra Wide (Upper L.H.)	12	01-3415	Nut
03	01-2412	Screw	13	01-4672-0-003	Lockwasher
04	01-4446	Washer	14	42-0073-0-003	Brush Arm (Lower R.H.)
05	42-0846-1	Slide Block Cover			
06	01-7530	Key			
07	41-0433	Slide Block			
08	01-2413	Screw			
09	42-0073-0-001	Brush Arm (Upper R.H.)			
	42-0073-0-020	Brush Arm Extra Wide (Upper R.H.)			

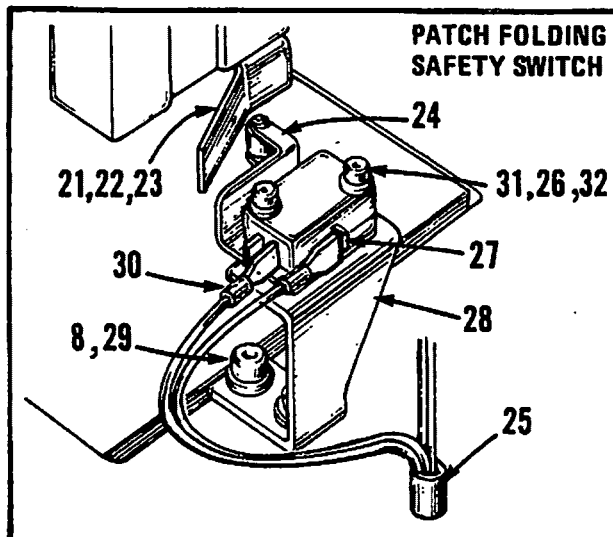
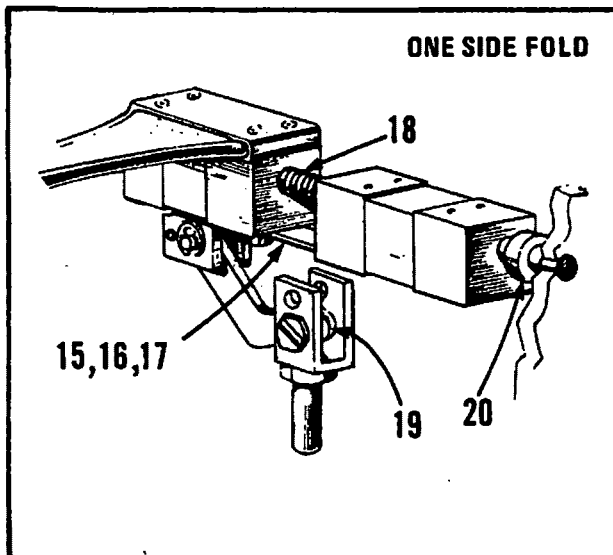
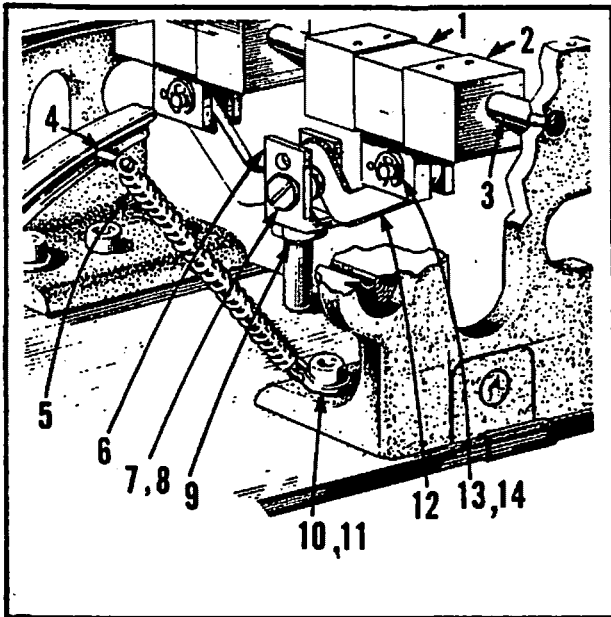




DET.	PART NUMBER	DESCRIPTION
1	01-2415	Screw
2	40-0070-0-072	Brush (L.H. 3/8"-1/2")
	41-0070-0-072	Brush (L.H. 5/8"-7/8")
3	chart, page 7	Patch Locator (L.H.)
4	01-2407	Screw
5	01-3426	Nut
6	01-2569	Screw
7	41-0468	Pivot
8	01-2413	Screw
9	01-4406	Washer
10	01-6521	Rollpin

11	— 41-0089-0-570 41-0089-0-670 41-0089-0-770	Brush Blades for Heavy Weight Mat. Medium Weight Mat. Med./Light Weight Mat. used on all models equipped with Auto- matic Patch Loaders
	41-0089-0-870	Light Weight Mat.
12	40-0762-1	Pad, self adhesive when working with silk lining or similar material, pads may be attached to brush blade as shown
13	40-0070-0-071 41-0070-0-071	Brush (R.H. 3/8"-1/2") Brush (R.H. 5/8"-7/8")
14	see chart, pg. 7	Patch Locator (R.H.)
15	40-0476	Leveling Pin

## PATCH FOLDING



DET.	PART NUMBER	DESCRIPTION
01	41-0081-0-000	Slide Bracket
02	41-0433-0-000	Slide Block
03	41-0080-0-000	Slide Bar
04	01-1422-0-000	Screw, Special
05	01-5419-0-000	Spring
06	41-0088-0-000	Clevis
07	01-2580-0-000	Screw
08	01-4003-0-000	Lockwasher
09	01-3434-0-000	Nut
10	01-2404-0-000	Screw
11	40-0434-0-000	Anchor
12	41-0086-0-000	Spreader Arm
13	01-6483-0-000	Pin
14	01-6474-0-000	Retaining Ring
15	41-0796-0-000	Link
16	01-2693-0-000	Screw
17	01-4411-0-000	Lockwasher
18	01-5486-0-000	Spring
19	01-4533-0-000	Spacer
20	01-4534-0-000	Spacer
21	40-0809-0-000	Actuator
22	01-2413-0-000	Screw
23	01-4406-0-000	Lockwasher
24	04-0342-0-005	Actuator, repl.part
25	42-0262-1-116	Head Harness
26	01-4405-0-000	Lockwasher
27	04-0250-0-000	Switch
28	40-0808-0-000	Bracket
29	01-2425-0-000	Screw
30	04-0258-0-187	Wire Terminal
31	01-2748-0-000	Screw
32	60-0079-0-000	Nut Plate

## CLAMPING AND FOLDING REPLACEMENT PARTS

MODELS		CLAMPFOOT ASSEMBLY		SUPPORT PLATES				PATCH LOCATORS <sup>(4)</sup>		BLOCK COVER	
SIZE	STYLE OF WELT	PART	SOLE <sup>(2)</sup>	LEFT GRAY *	RIGHT GRAY *	LEFT BLACK **	RIGHT BLACK **	LEFT	RIGHT	GRAY *	BLACK **
3/8 & 7/16	DOUBLE	41-0069-0-053	41-0090-0-100 32-1036-0-000	41-0096-1-052 (ASSY) 41-0096-0-002 (SUPP) 41-0094-2-002 (COVER)	41-0096-1-051 (ASSY) 41-0096-0-001 (SUPP) 41-0094-2-001 (COVER)	32-2210-0-052 (ASSY) 41-0096-0-002 (SUPP) 32-2210-0-002 (COVER)	32-2210-0-051 (ASSY) 41-0096-0-001 (SUPP) 32-2210-0-001 (COVER)	40-0470-0-072 (5)	40-0470-0-071	40-0717-2-375	32-2211-0-000
		42-0069-0-153 (1)	40-0766-0-000 (3)	"	"	"	"	"	"	"	"
	SINGLE	"	"	"	"	"	"	"	"	"	"
1/2	DOUBLE	41-0069-0-053 (8)	41-0090-0-100 32-1036-0-000	"	"	"	"	"	"	40-0717-2-500	32-2212-0-000
		40-0069-0-051	"	"	"	"	"	"	"	"	"
		42-0069-0-153 (1)	40-0766-0-000 (3)	"	"	"	"	"	"	"	"
	SINGLE	"	"	"	"	"	"	" (6)	40-0470-0-073	"	"
5/8	DOUBLE	42-0069-0-154 (1)	"	"	"	"	"	40-0470-0-074	"	"	"
		41-0069-0-050	"	"	"	"	"	"	"	"	"
	SINGLE	"	"	"	"	"	"	40-0470-0-072	"	"	"
	DOUBLE	41-0069-0-052	"	"	"	"	"	"	40-0470-0-071	"	"
3/4	SINGLE	"	"	"	"	"	"	"	40-0470-0-073	"	"
	OVER-LAPPING	"	"	41-0096-1-058 (ASSY) 41-0096-0-008 (SUPP) 41-0094-2-006 (COVER)	41-0096-1-057 (ASSY) 41-0096-0-005 (SUPP) 41-0094-2-005 (COVER)	32-2209-0-052 (ASSY) 41-0096-0-006 (SUPP) 32-2209-0-002 (COVER)	32-2209-0-051 (ASSY) 41-0096-0-005 (SUPP) 32-2209-0-001 (COVER)	40-0470-0-074 (7) 41-0470-0-072	40-0470-0-073 (7) 41-0470-0-071	"	"
	DOUBLE	41-0069-0-152 (1)	"	41-0096-1-052 (ASSY) 41-0096-0-002 (SUPP) 41-0094-2-002 (COVER)	41-0096-1-051 (ASSY) 41-0096-0-001 (SUPP) 41-0094-2-001 (COVER)	32-2210-0-052 (ASSY) 41-0096-0-002 (SUPP) 32-2210-0-001 (COVER)	32-2210-0-051 (ASSY) 41-0096-0-001 (SUPP) 32-2210-0-001 (COVER)	40-0470-0-072	40-0470-0-071	"	"
		41-0069-0-051	"	"	"	"	"	"	"	"	"
7/8	SINGLE	"	"	"	"	"	"	41-0470-0-072	41-0470-0-071	"	"

## NOTES

1. CLOTH SPREADER MODELS
2. ATTACH WITH 05-0091-0-000 CEMENT. FURNISHED IN MULTIPLES OF ONE FOOT.
3. NOT USED ON MODELS EQUIPPED WITH AUTO-MATIC PATCH LOADER.

5. USE 40-0470-0-072 FOR TROUSER APPLICATIONS.
6. INSERT 01-4436-0-000 WASHERS BETWEEN PATCH LOCATOR AND BRUSH. SUBSTITUTE 01-2402-0-000 SCREW FOR REGULAR ONES.

7. USE WITH 5 1/4" WIDE PATCH.
8. USE SPACER 40-0676-0-000 UNDER EACH SUPPORT PLATE WHEN USING THESE CLAMPFOOT ASSEMBLIES.

\* MATERIAL: 3A RESILIENT SAFETY WALK  
COLOR: GRAY

\*\* MATERIAL: GENERAL PURPOSE ANTISLIP SURFACING  
COLOR: BLACK

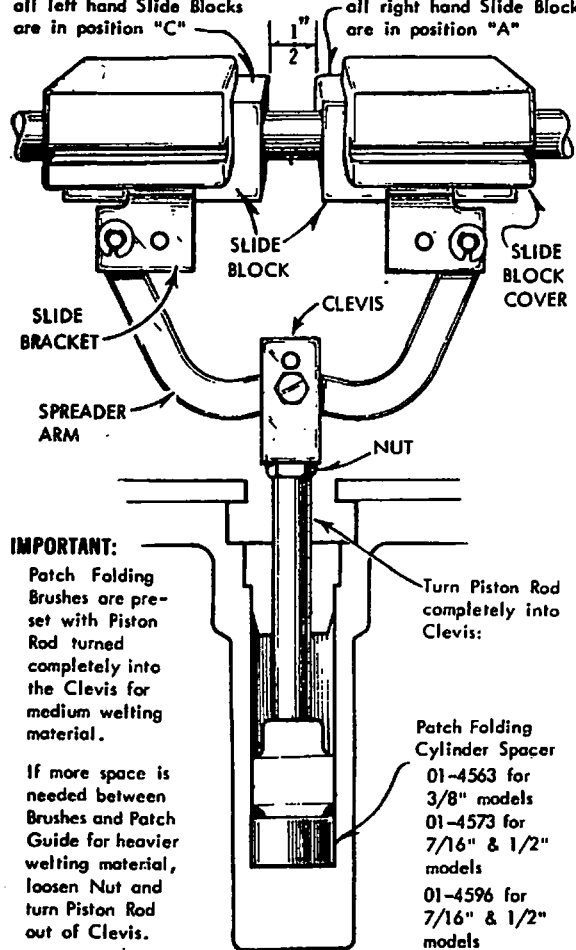
## MODELS

3/8" Double	.661	7/16" Double	.730
3/8" Double	.725	1/2" Double	.786
		1/2" Double	.850
7/16" Double	.690	7/16" Single	.744
		1/2" Single	.787

Slide Brush Arms to accommodate Brushes

all left hand Slide Blocks are in position "C"

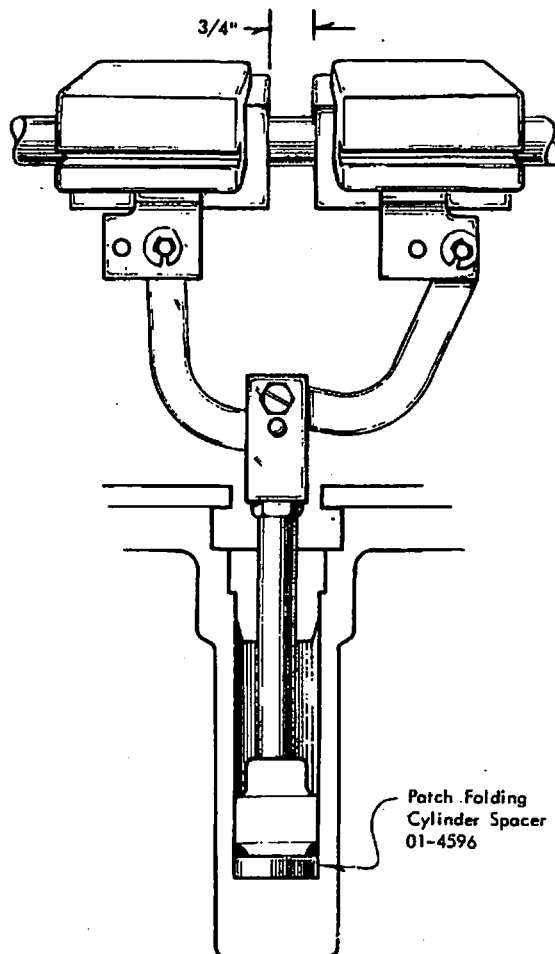
all right hand Slide Blocks are in position "A"



☛ = use these holes to position upper Brush Arms to Slide Block Covers

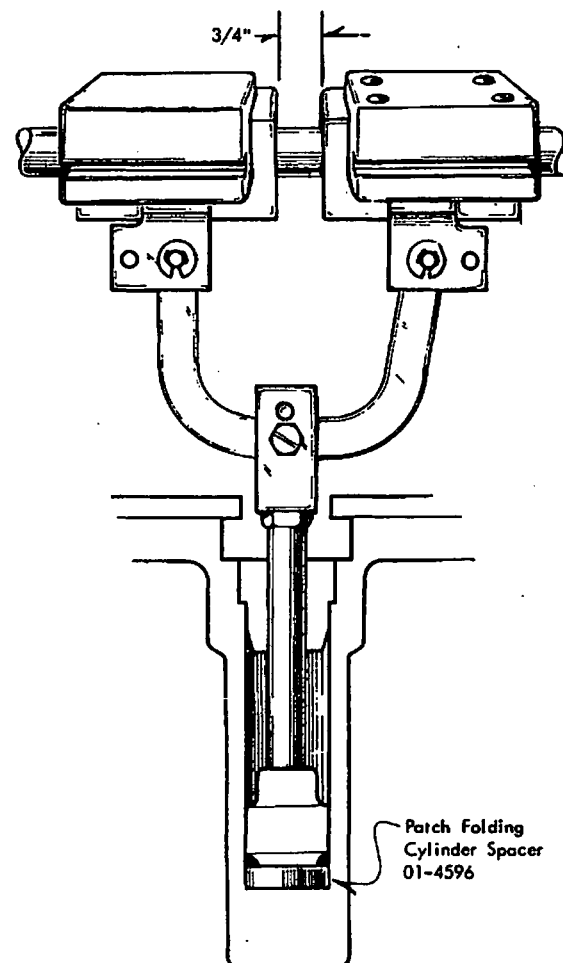
## MODELS

1/2" Single, left .932

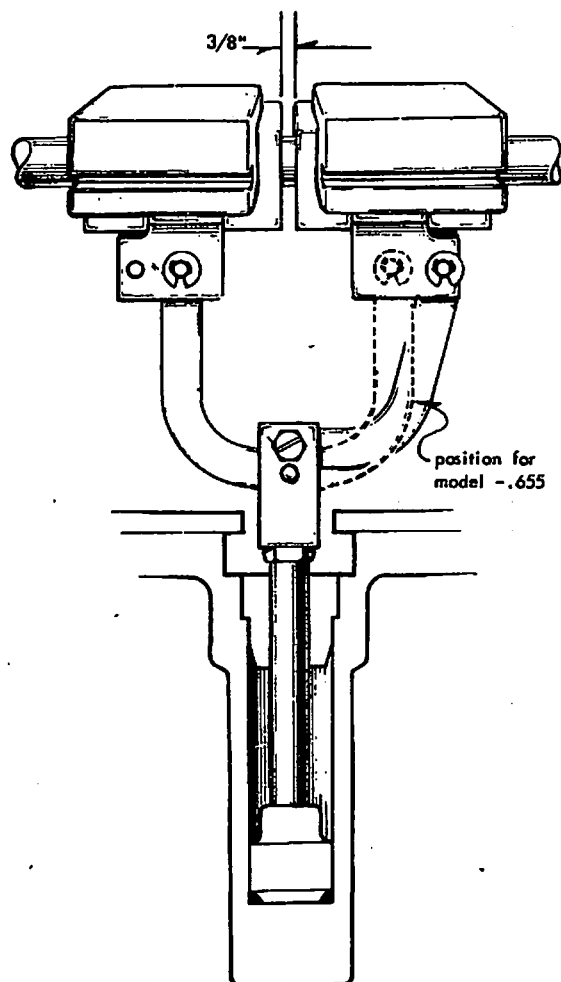


## MODELS

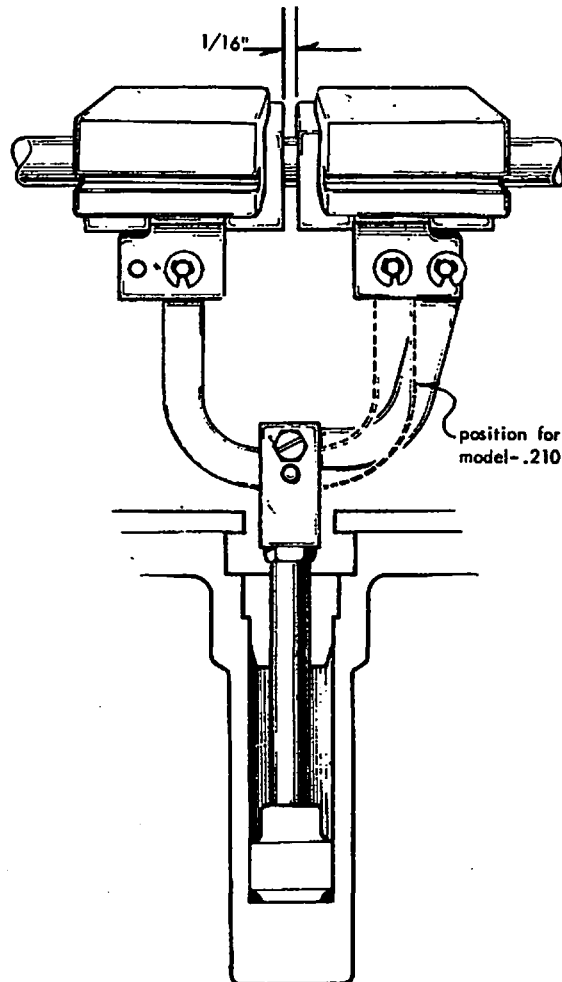
5/8" Double .100  
5/8" Double .148  
3/4" Double .350



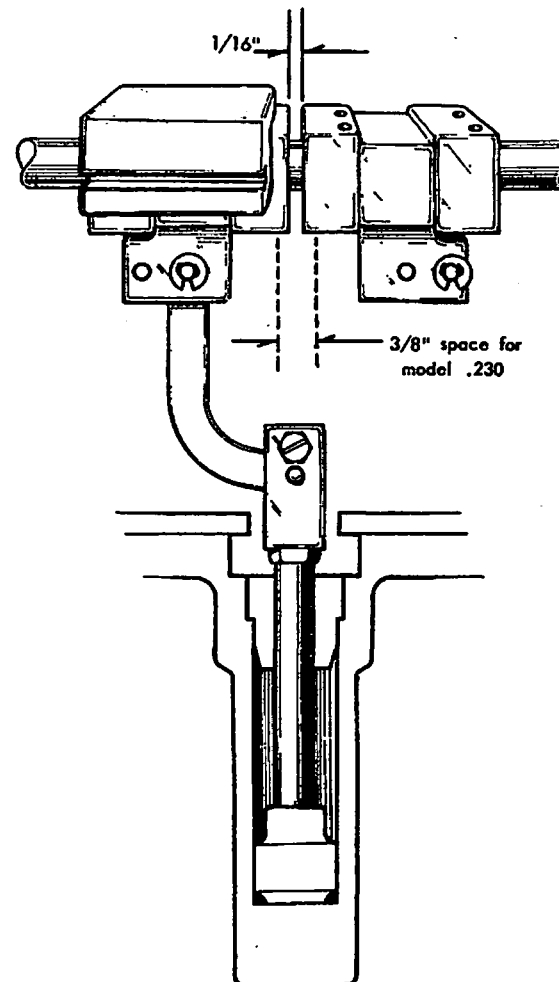
MODELS			
5/8"	Single	.230	
7/8"	Double	.655	



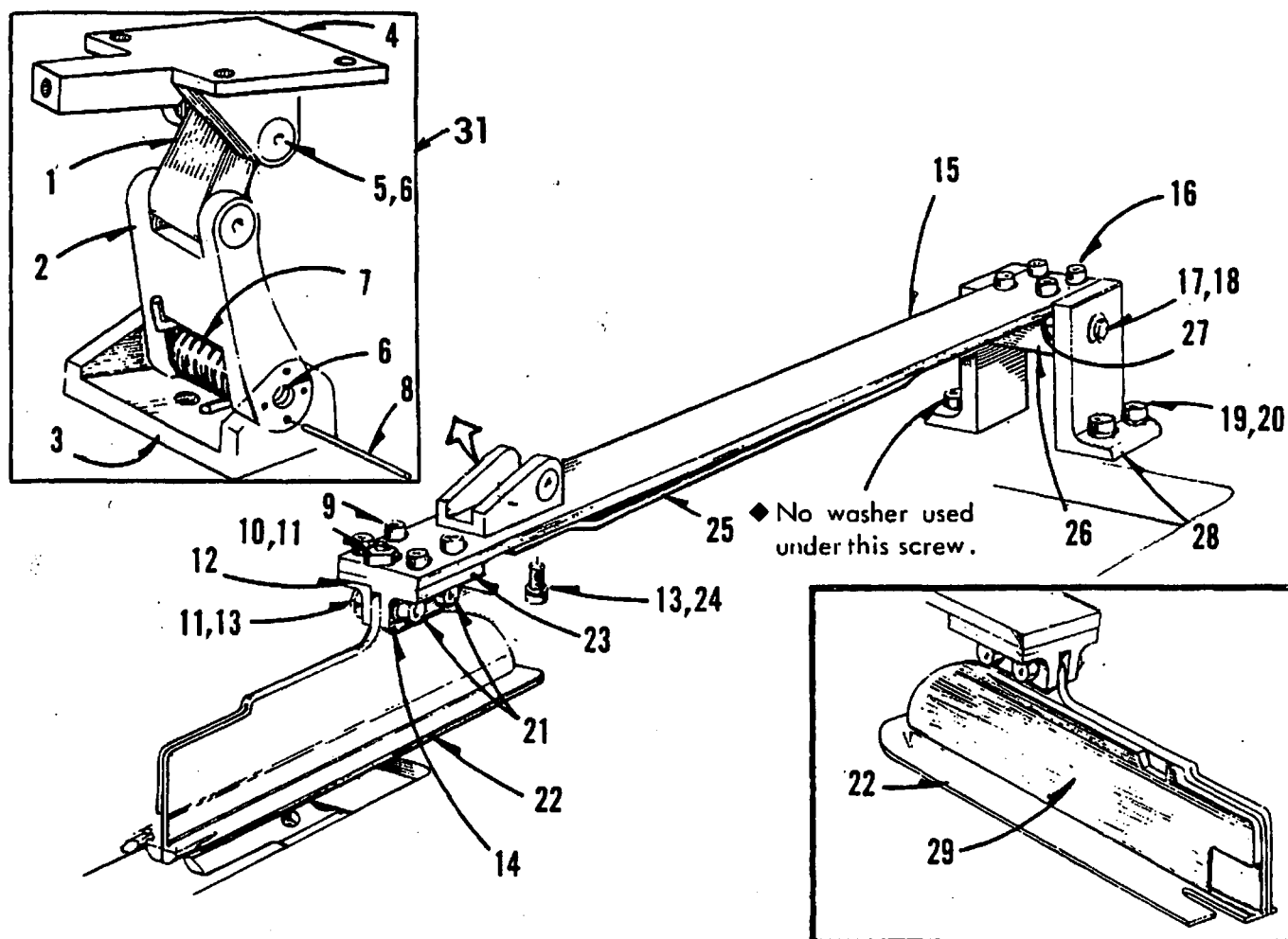
MODELS			
7/8"	Single	.654	
3/4"	Single	.470	
3/4"	Overlapping Single, left and right	.210	



MODELS			
3/4"	Single	.470	
7/8"	Single	.654	
5/8"	Single	.230	



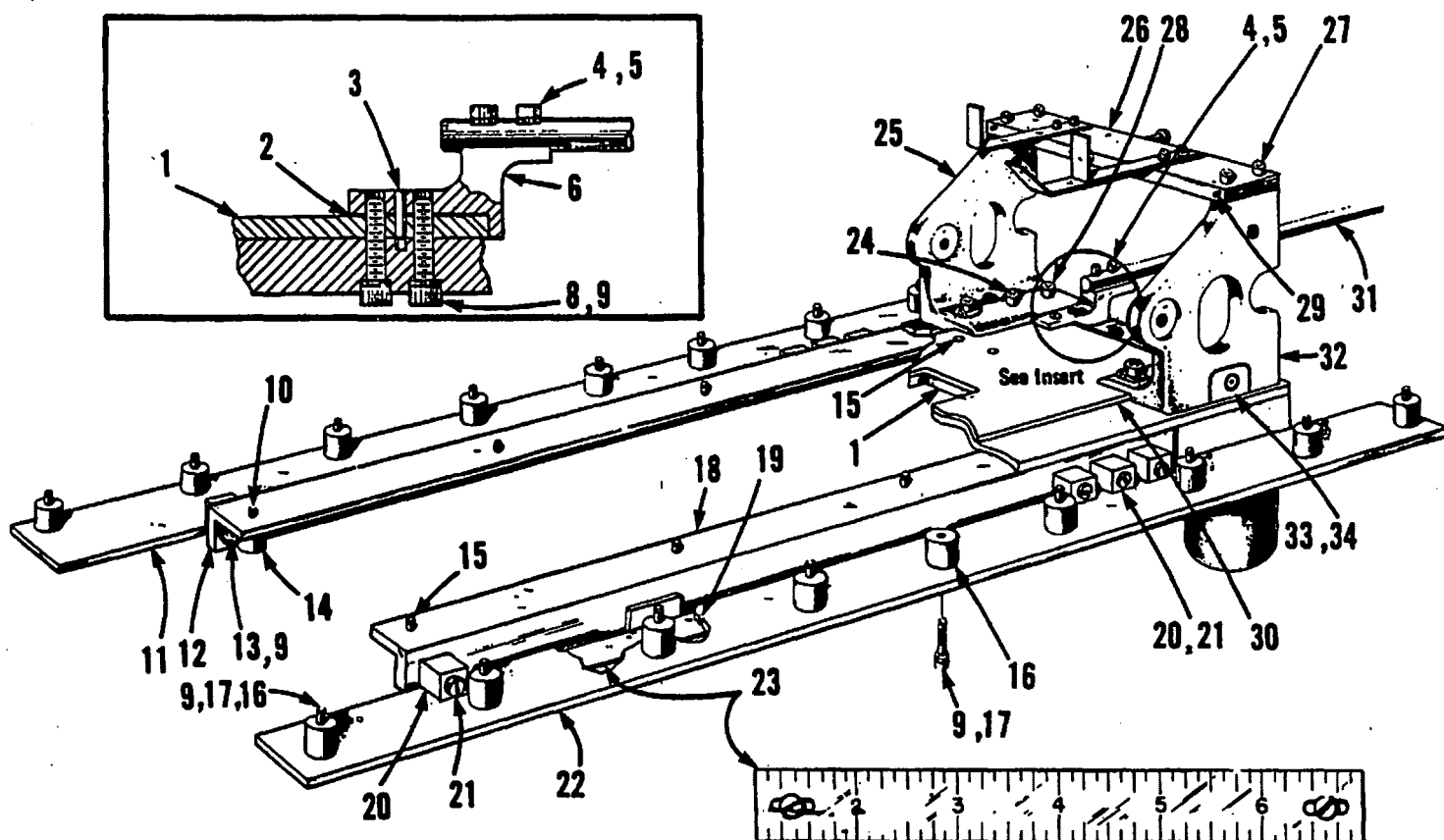




DET.	PART NUMBER	DESCRIPTION
01	42-0829	Lower Link
02	42-0828	Upper Link
03	41-0615	Bracket
04	41-0427-1	Guide Block, front (3/8"-1/2")
	32-2133	Guide Block, front (5/8"-7/8")
05	01-2713	Screw
06	01-7482	Heli-Coil
07	01-5490	Spring
08	01-6633	Pin
09	01-2411	Screw
10	01-2409	Screw
11	01-3426	Nut
12	40-0648	Nut Plate
13	01-4406	Lockwasher
14	01-4470	Spacer
15	40-0413	Patch Guide Arm
16	01-2412	Screw
17	01-6488	Pin

18	01-6454	Retaining Ring
19	01-2425	Screw
20	01-4003	Washer
21	01-2448	Screw
22	see page 11	Patch Guide
23	40-0414-1	Patch Guide Block
24	01-2531	Screw
25	40-0708	Cam Plate
	41-0708	Cam Plate, single welt
26	40-0053	Pivot Block
27	41-0683	Spacer (5/8"-7/8" only)
28	40-0412	Bracket
29	40-0051	Spacer (7/16"-1/2")
		Spacer (5/8"-7/8")
31	32-2142-0-050	Stabilizer Asm. (5/8"-7/8")

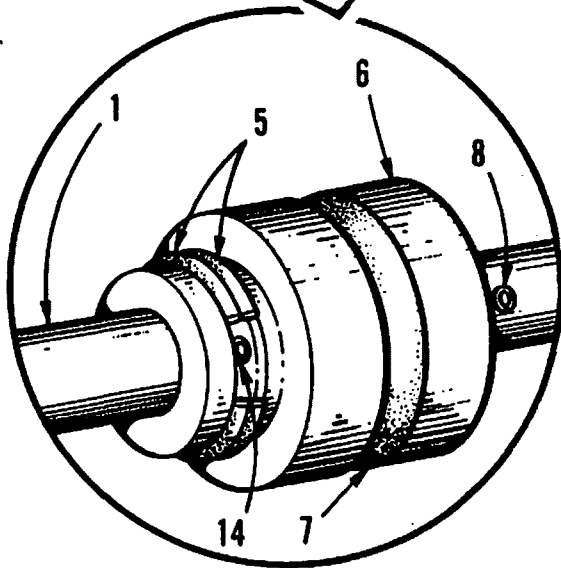
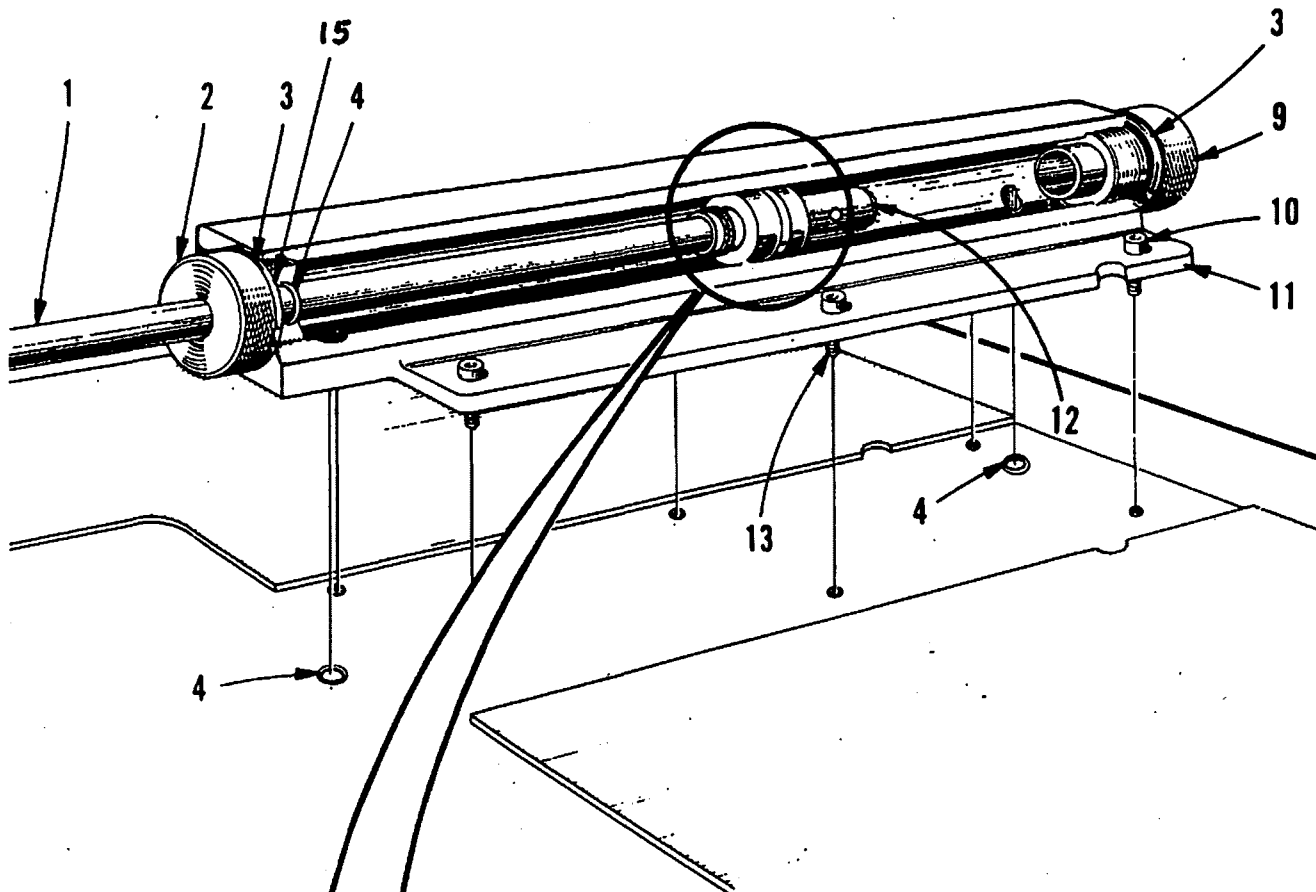
MODELS			NEEDLE HOLDER	THROAT PLATE
SIZE	STYLE OF WELT	PATCH GUIDE ASM.	page 21	
3/8	DOUBLE W = .661	32-2080-0-052	32-2200-0-001	32-2070-1-051
	DOUBLE W = .725	32-2080-0-051	32-2200-0-001	32-2070-1-051
	SINGLE W = .661	32-2080-0-053	32-2200-0-001	32-2070-1-051
7/16	DOUBLE W = .690	<del>32-2080-0-052</del> 32-2084-0-051	32-2200-0-002	32-2070-1-052
	DOUBLE W = .730	<del>32-2080-0-051</del> 32-2084-0-050	32-2200-0-002	32-2070-1-052
	SINGLE OFFSET W = .759	<del>32-2080-0-051</del> 32-2114-0-050	32-2200-0-002	32-2070-1-052
1/2	DOUBLE W = .786	32-2088-0-051	32-2200-0-003	32-2070-1-053
	DOUBLE W = .850	32-2088-0-050	32-2200-0-003	32-2070-1-053
	SINGLE W = .801	32-2115-0-050	32-2200-0-003	32-2070-1-053
	SINGLE W = .945	32-2115-0-051	32-2200-0-003	32-2070-1-053
5/8	DOUBLE W = 1.100	32-2111-0-050	32-2200-0-004	32-2070-1-054
	DOUBLE W = 1.1480	32-2111-0-051	32-2200-0-004	32-2070-1-054
	SINGLE W = 1.230	32-2116-0-050	32-2200-0-004	32-2070-1-054
3/4	DOUBLE W = 1.350	32-2112-0-050	32-2200-0-005	32-2070-1-055
	SINGLE W = 1.470	32-2117-0-050	32-2200-0-005	32-2070-1-055
	OVERLAPPING SINGLE 100	32-2128-0-050	32-2200-0-005	32-2070-1-055
7/8	DOUBLE W = 1.655	32-2113-0-050	32-2200-0-006	32-2070-1-056
	SINGLE W = 1.659	32-2118-0-050	32-2200-0-006	32-2070-1-056



DET.	PART NUMBER	DESCRIPTION
01	32-2110-0-050	Clamp Plate
02	42-1600	Shim
03	01-6652	Pin
04	01-2531	Screw
05	01-4406	Lockwasher
06	42-0100	Bracket
08	01-2446	Screw
09	01-4003	Lockwasher
10	01-2450	Screw
11	41-0452-0-004	Track (L.H.)
12	41-0451-0-002	Bracket (L.H.)
13	01-3404	Nut
14	40-0547	Actuator
15	01-2534	Screw
16	01-4442	Spacer
17	01-2490	Screw
18	41-0451-0-001	Bracket
19	01-2481	Screw
20	42-1624	Slide
21	01-1444	Screw
22	41-0452-0-003	Track (R.H.)

23	41-0540	Scale (Inches)
	41-0540-0-017	Scale (Metric, Extra Long)
	41-0540-0-070	Scale (7-1/2")
	41-0540-0-071	Scale (Metric)
24	01-2407	Screw
25	41-0076-0-002	Bracket (L.H.)
26	41-0075	Plate
27	01-2448	Screw
28	01-2447	Screw
29	01-2591	Screw
30	41-0680	Stiffener Plate
31	40-0252	Piston Rod
32	41-0076-0-001	Bracket (R.H.)
33	43-2505	Access Plate
34	01-2652	Screw

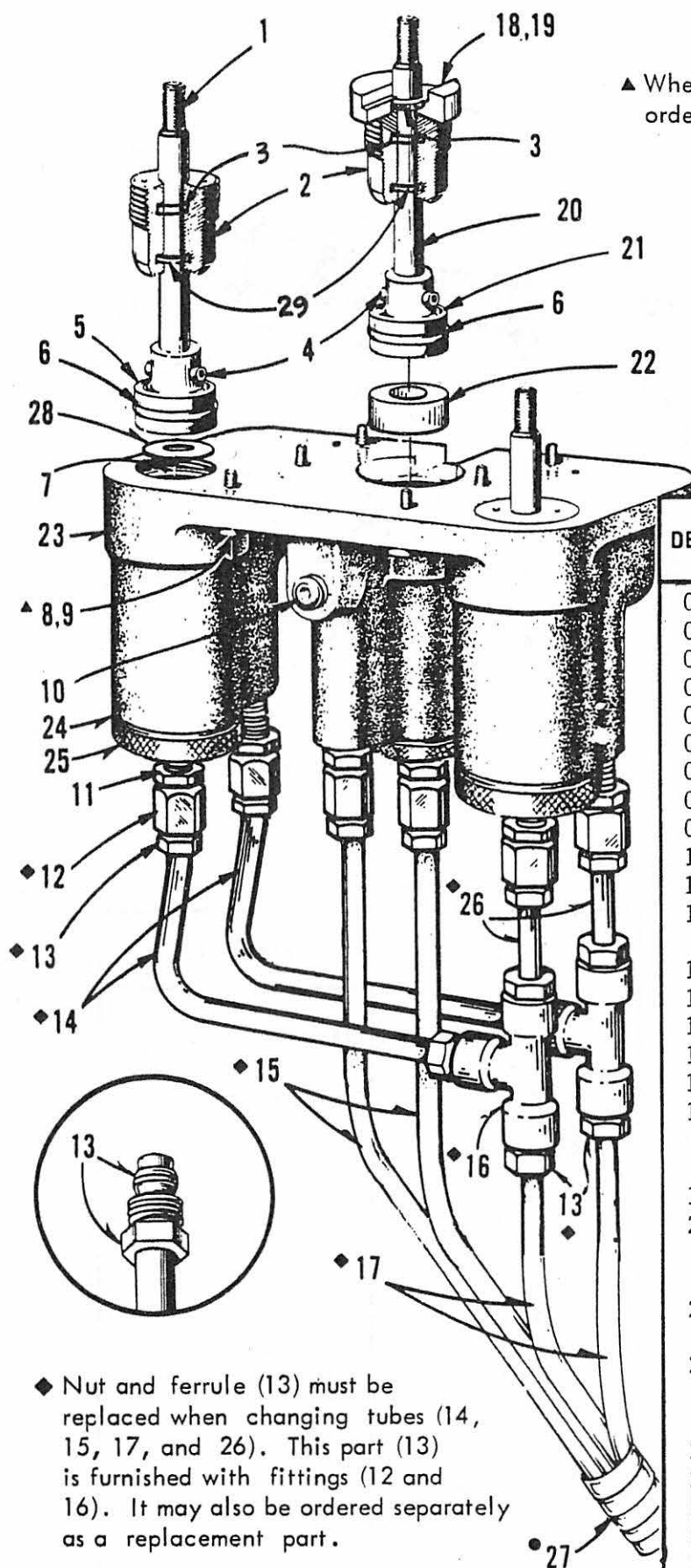
When replacing thread insert in the bedplate, order part #01-7419.



DET.	PART NUMBER	DESCRIPTION
1	40-0252	Piston Rod
2	42-1058	Cap Asm.
3	30-0194	Gasket
4	01-4480	"O" Ring
5	01-4450	"O" Ring
6	40-0472-1	Piston
7	01-4451	"O" Ring
8	01-6501	Roll Pin
9	40-0453-1	End Cap
10	01-2430	Screw
11	32-3032	Cylinder
12	40-0528	Plunger
13	01-2447	Screw
14	01-6652	Roll Pin
15	01-4301	"U-Cup" Seal



▲ When replacing thread insert in clamp plate, order part no. 01-7419.

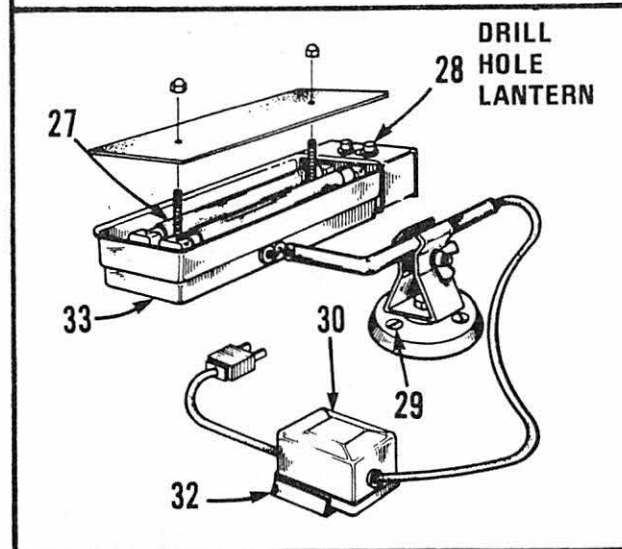
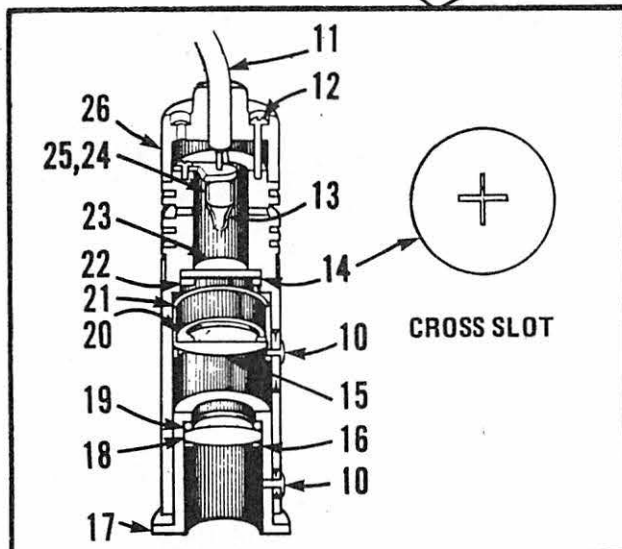
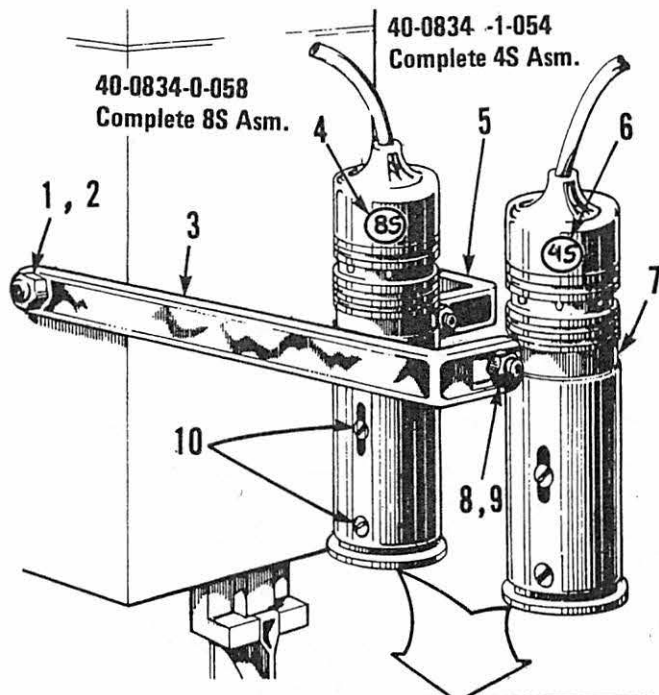


◆ Nut and ferrule (13) must be replaced when changing tubes (14, 15, 17, and 26). This part (13) is furnished with fittings (12 and 16). It may also be ordered separately as a replacement part.

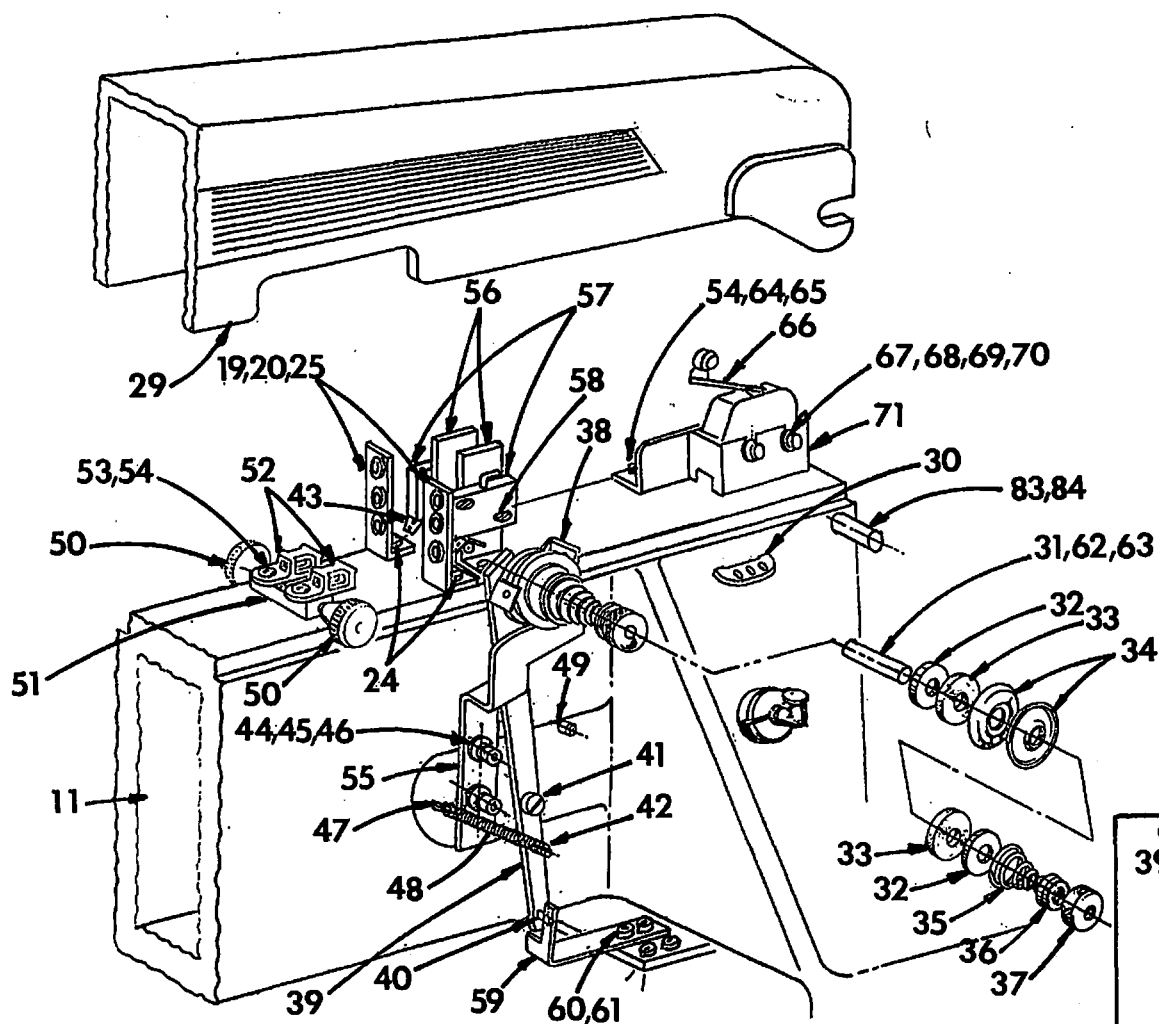
DET.	PART NUMBER	DESCRIPTION
01	40-0190	Piston Rod
02	42-1059	Cap Asm.
03	01-4480	'O' Ring
04	01-6470	Roll Pin
05	40-0191	Piston
06	01-4451	'O' Ring
07	01-4438	'O' Ring
08	01-2425	Screw
09	01-4003	Lockwasher
10	01-2438	Plug
11	01-3424	Lock Nut
12	40-0310-1	Nut, Ferrule & Fitting
13	40-0575-2	Nut and Ferrule
14	42-0516	Copper Tube
15	07-0294	Tubing, 34" •
16	40-0519-2	'T' Fitting
17	07-0294	Tubing, 31" •
18	41-0681	Cap Retainer
	32-2129	Cap Retainer (7/8" only)
19	01-6555	Roll Pin
20	41-0202	Piston Rod
	32-2109	Piston Rod (7/8" only)
21	40-0203	Piston
	32-2108	Piston (7/8" only)
22	01-4563-1	Spacer
	01-4573	Spacer { see pages 8&9
	01-4596	Spacer
23	41-0229-2-050	Cylinder Housing
24	30-0194	Gasket
25	40-0744-1	Cap
26	07-0294	Copper Tube
27	40-0586	'Spirap', 45" •
28	01-4439	Washer/Spacer
29	01-4301	'U-Cup' Seal

● Available only in multiples of one foot.



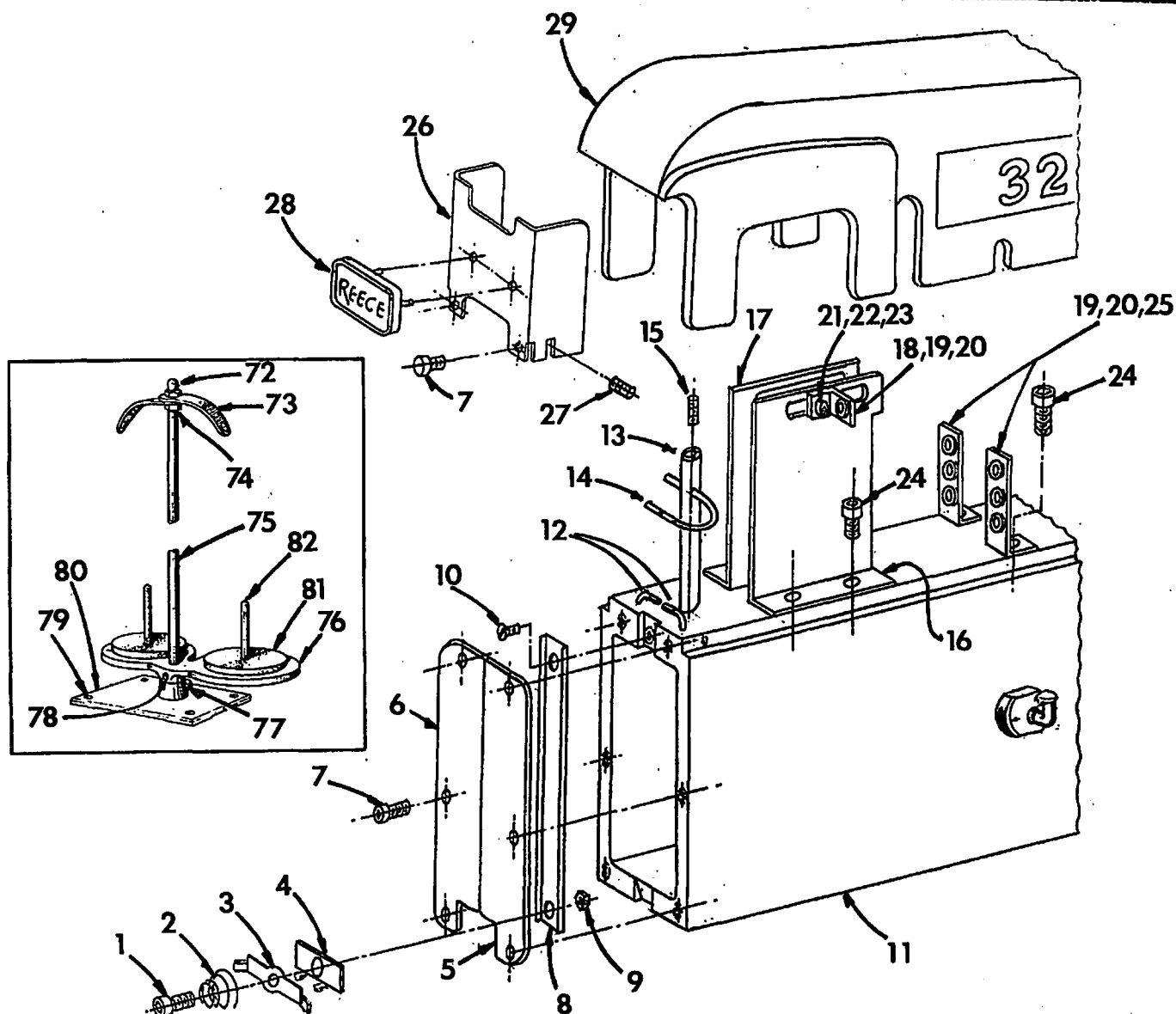


DET.	PART NUMBER	DESCRIPTION
1	42-1005	Stud
2	01-3417	Nut
3	42-1002-0-002	Arm (Long)
4	05-1085-0-002	Decal (8S)
5	42-1002-0-001	Arm (Short)
6	05-1085-0-001	Decal (4S)
7	40-0791	Brace
8	01-2531	Screw
9	01-3401	Jam Nut
10	01-2481	Screw
11	40-0478-0-008	Sleaving (18")
12	01-2653	Screw
13	40-0788	Lamp (GE #261)
14	40-0834-0-004	Reticle Cross Slot (4S)
	40-0834-0-008	Reticle Cross Slot (8S)
15	40-0786-1	Lens
16	01-6628	Retaining Ring
17	40-0787	Carrier
18	40-0803-1	Lens
19	01-4507	"O" Ring
20	01-6629	Retaining Ring
21	40-0785	Carrier
22	01-6621	Retaining Ring
23	40-0782-1	Glass Disc
24	40-0789-0-050	Lamp Holder
25	01-2518	Screw
26	40-0781	End Cap
27	05-0381	Lamp
28	05-0096	Switch
29	01-2444	Screw
30	05-0383-0-110	Ballast
32	01-4411	Washer
33	05-0450-0-050	Lantern Assembly (complete assembly)

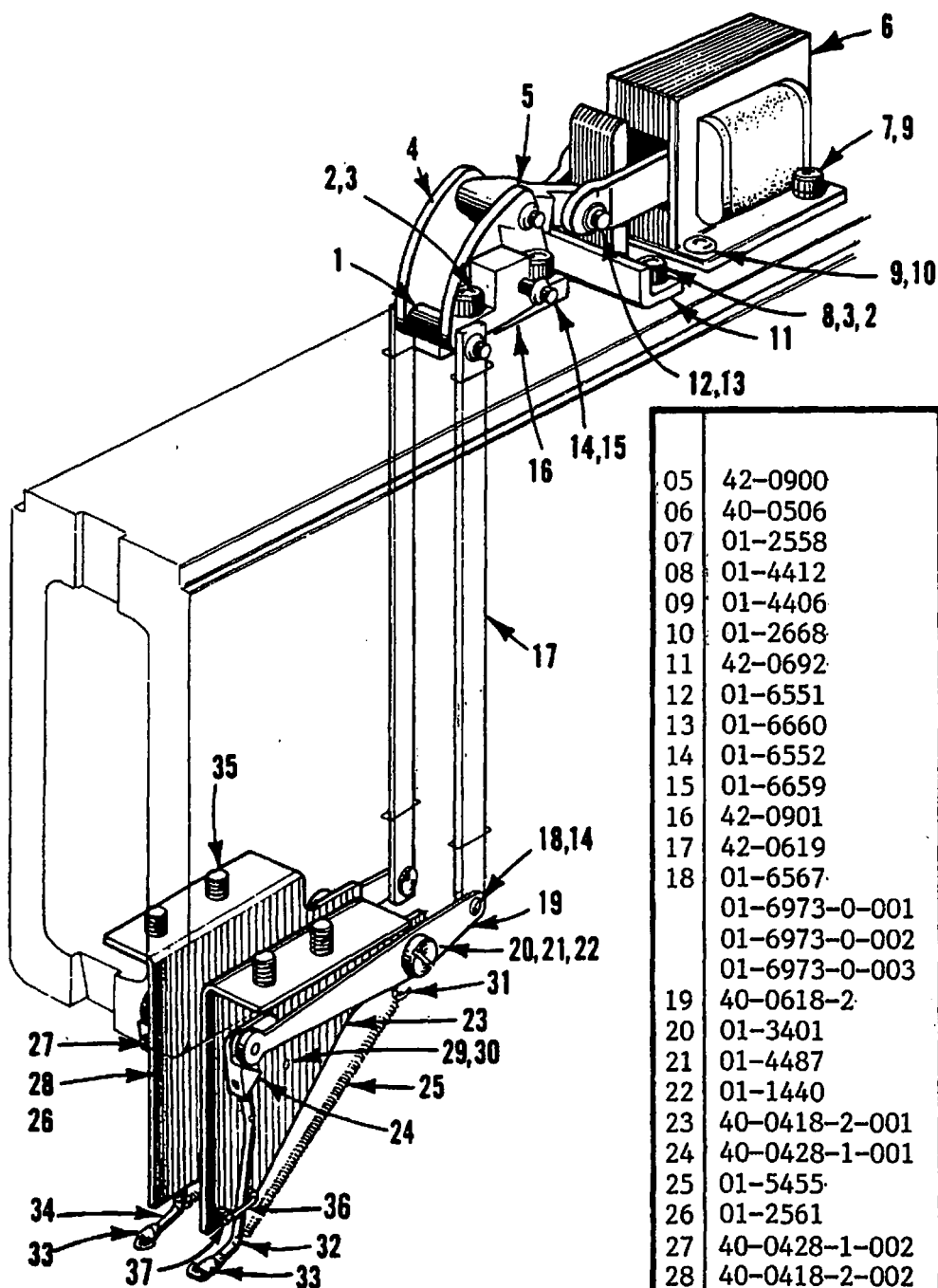


DET.	PART NUMBER	DESCRIPTION
01	01-1475	Screw
02	01-1144	Spring
03	32-1030	Plate
04	32-1015-1	Plate-Spacer
05	32-1013	Front Cover-Right
06	32-1020	Front Cover-Left
07	01-2401	Screw
08	32-1014	Guide
09	01-3016	Nut
10	01-2406	Screw
11	32-1021-0-050	Head
12	32-1006	Bar-Adjustable
13	32-1012-0-050	Needle Bar Asm.
14	32-1005	Thread Take-up
15	01-2442-0-001	Screw
16	32-1010	Bracket-Right
17	32-1019	Bracket-Left
18	32-1007	Eyelet
19	01-7447-1	Guide
20	01-6551	Retaining Ring
21	01-2582	Screw
22	01-4029	Washer
23	01-3401	Nut

24	01-2411	Screw
25	42-0037	Thread Guide
26	32-1011	Cover-Top-Front
27	01-2409	Screw
28	05-1130	Reece Nameplate
29	32-1017	Head Cover
30	05-1302	Thread Smoother
31	01-1433	Stud
32	01-4005	Washer
33	01-4424	Felt Washer
34	40-0475	Tension Disc
35	01-5001	Spring
36	20-0603	Collar
37	01-3036	Nut
38	32-1009	Thread Guide
39	32-1008-0-050	Lever Asm.
	32-1034-0-050	Thd.Drawoff Lever Asm.
	(NEW)	(Left) (Not Shown)
	32-1035-0-050	Thd.Drawoff Lever Asm.
	(NEW)	(Right)
40	01-6430	Pin
41	01-1410	Screw
42	01-6433	Pin



DET.	PART NUMBER	DESCRIPTION			
43	32-1022	Switch Actuator	60	01-2695	Screw
44	01-2506	Screw	61	01-4411	Washer
45	01-4407	Lockwasher	62	01-7448	Post
46	01-4402	Washer	63	01-6474	Ring
47	01-6452	Pin	64	42-0955	Bracket
48	01-5418	Spring	65	01-2411	Screw
49	01-2413	Screw	66	41-0257	Switch
50	42-0902	Knob	67	42-1007	Rocker Bracket
51	42-0903	Block	68	42-1208	Stop Lever
52	04-1400	Anchor-Tie	69	01-2628	Screw
53	01-2448	Screw	70	01-3401	Nut
54	01-4406	Washer	71	06-0170	Enclosure
55	32-1023	Tension Release-Right	72	01-3052	Nut
	32-1024	Tension Release-Left	73	32-3033-0-050	Arm
		(Use in machines with	74	01-3026	Nut
		Serial No. 3210450	75	05-0005	Post
		and lower.)	76	05-0002-0-001	Shelf
56	42-0896-0-006	Bracket	77	01-2492	Screw
57	04-1358-1	Switch	78	01-2028	Screw
58	60-0079	Nut Plate	79	01-2795	Screw
59	41-0034-0-001	Actuator-Right	80	05-0001-0-001	Base
			81	05-0006	Felt Pad
			82	01-6138-1	Stand Post
			83	01-6662	Retaining Ring



DET.	PART NUMBER	DESCRIPTION
1	01-6658	Shaft
2	01-2506	Screw
3	01-4407	Lock Washer
4	42-0899	Lever

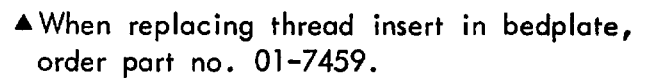
05	42-0900	Link
06	40-0506	Solenoid
07	01-2558	Screw
08	01-4412	Washer
09	01-4406	Lockwasher
10	01-2668	Screw
11	42-0692	Stop
12	01-6551	Retainer
13	01-6660	Pin
14	01-6552	Retainer
15	01-6659	Shaft
16	42-0901	Block
17	42-0619	Link
18	01-6567	Pin (3/8"-1/2")
	01-6973-0-001	Pin (3/4")
	01-6973-0-002	Pin (7/8")
	01-6973-0-003	Pin (5/8")
19	40-0618-2	Link
20	01-3401	Nut
21	01-4487	Spacer
22	01-1440	Screw
23	40-0418-2-001	Bracket (R.H.)
24	40-0428-1-001	Holder (R.H.)
25	01-5455	Spring
26	01-2561	Screw
27	40-0428-1-002	Holder (L.H.)
28	40-0418-2-002	Bracket (L.H.)
29	01-4420	Washer
30	01-6480	Shaft
31	40-0759	Hook
32	40-0436-2-051	Arm (R.H.)
33	40-0437	Sleeve
34	40-0436-2-052	Arm (L.H.)
35	01-2419	Screw
36	40-0760-1	Retainer
37	01-6569	Spring Pin





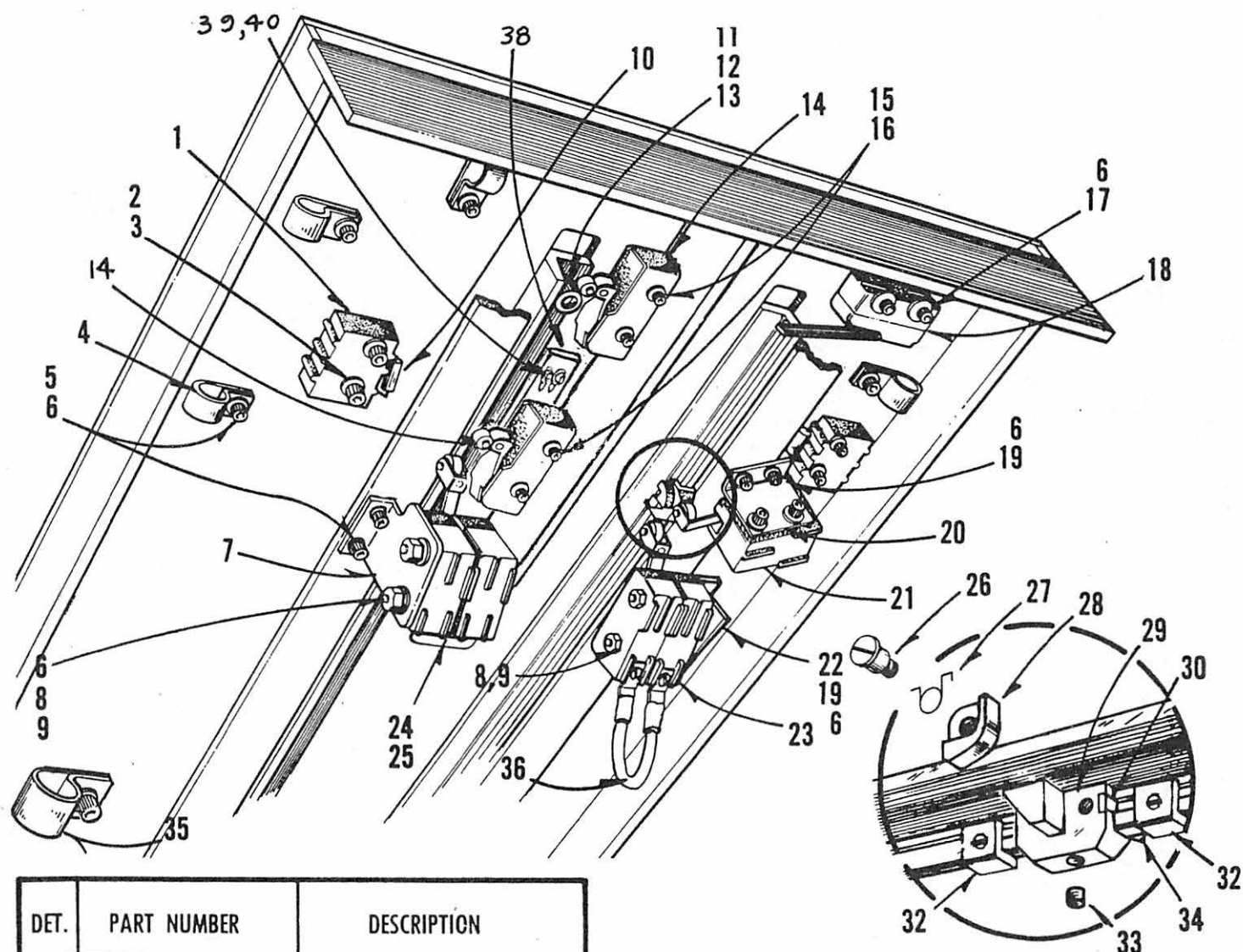
Needles for the Reece Series 32 Welting Machine are packaged in boxes of 100, in the sizes and types listed. These needles are of superior struck groove construction, and chromium plated. When ordering, specify quantity and needle part number. The last group in part number indicates needle size.

PART NUMBER	SIZE	CHARACTERISTICS	APPLICATIONS
02-0950-0-100 02-0950-0-110 02-0950-0-111 02-0950-0-112	Very fine (00) Fine (0) Medium (1) Heavy (2)	Sharp point Sharp point (spotted) " "	Standard for the majority of fibers and materials of average weight and texture, including knit goods.
02-0951-0-110  02-0951-0-111	Fine (0)  Medium (1)	Sharp point, Ball eye (spotted)  "	Applicable to closely woven fabrics or sewing over heavy seams, particularly in cottons. The ball eye produces a hole slightly larger than the needle blade diameter. This results in less needle heat than with needles of uniform diameter.
02-0952-0-100 02-0952-0-110 02-0952-0-111	Very fine (00) Fine (0) Medium (1)	Ball point Ball point (spotted) "	Use on synthetic fabrics, particularly if tightly woven or tightly knitted where the fibers of the material are subject to damage by the conventional sharp pointed needle.
02-0953-0-110  02-0953-0-111	Fine (0)  Medium (1)	Sharp point, double groove (spotted)  "	Applicable to materials that tend to trap needle thread as it descends into work, thereby disturbing thread take-up or causing thread breakage at needle eye. NOTE: Use double groove needles only when conditions warrant, as loop cast is smaller and may introduce skipping. Set looper points extremely close to needle blade.
02-0955-0-110  02-0955-0-111	Fine (0)  Medium (1)	Wedge point, Ball eye (spotted)  "	Applicable to leather and similar materials where conventional sharp pointed needles tend to leave excessive punctures. The slit made by the wedge point tends to close after penetration. This needle cuts at right angles to line of stitching, permitting higher stitch density where desirable. The ball eye tends to reduce needle heat.
02-0956-0-110  02-0956-0-111	Fine (0)  Medium (1)	Wedge point, ball eye, double groove (spotted)  "	Same application as type 955 needles, except double groove is desirable on thick leather and similar materials that tend to close on blade and trap needle thread as it descends into work. Refer to NOTE above on 953 needle application.
02-0958-0-110  02-0958-0-111	Fine (0)  Medium (1)	Spear point, ball eye, double groove (spotted)  "	Applicable to closely woven or heavily starched fabrics, leather, and similar materials that offer considerable resistance to needle penetration. The ball eye tends to reduce needle heating. Double groove minimizes tendency of material to trap the needle thread during descent into work, but the loopers must be set extremely close to needles to avoid skipping.



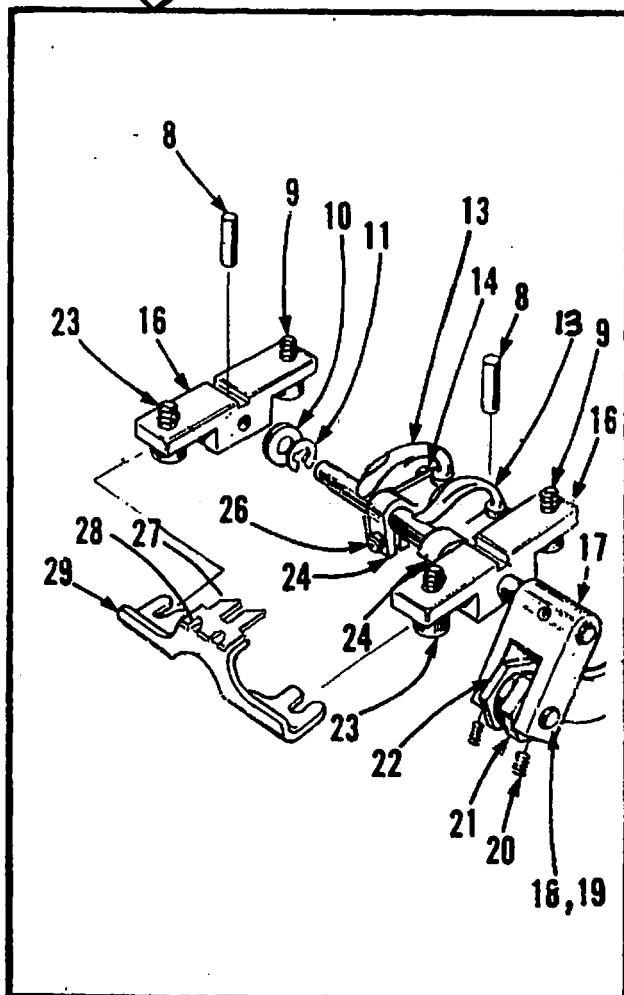
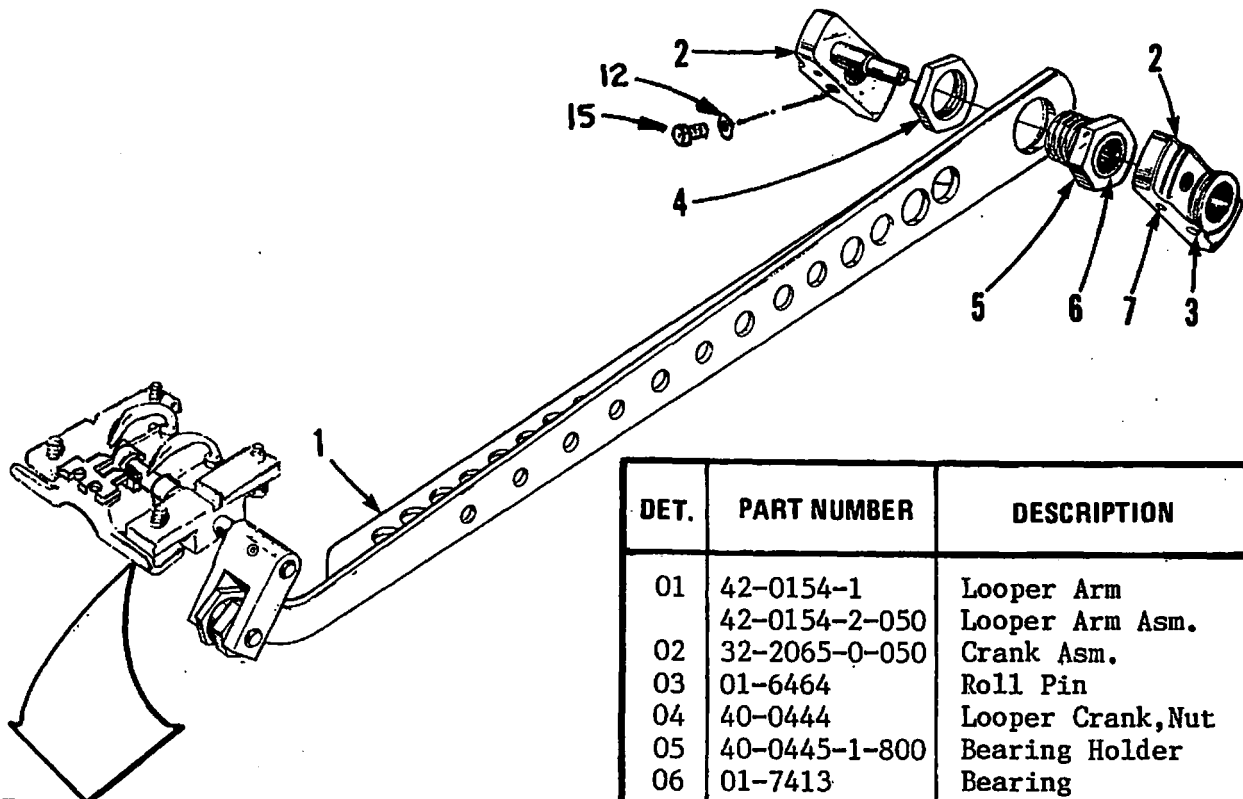
16	40-0466	Rod Connector
17	40-0593	Oil Inlet
18	01-3016	Nut
19	40-0467	Rod
20	01-8401	Key
21	40-0566	Front Shaft
22	30-0011	Oil Cup
23	01-6407	Pin
24	01-6454	Retaining Ring
25	40-0050-0-050	Front Lever
26	40-0010	Rear Shaft
27	40-0465	Rear Lever
28	01-6504	Pin
29	01-6475	Retaining Ring
30	01-6551	Plastic Ring
31	40-0567	Eccentric Bushing
32	30-0007	Bushing

## BEDPLATE/CLAMP TABLE - ELECTRICAL



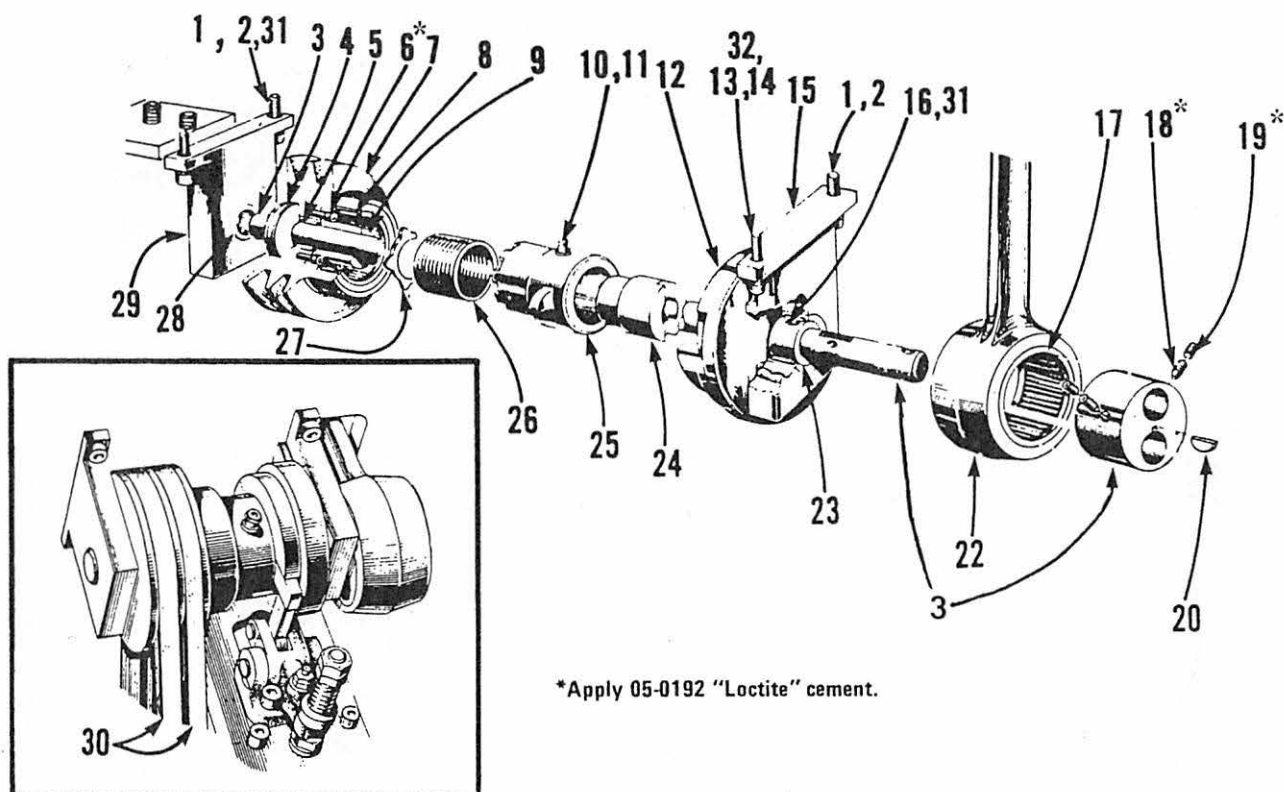
DET.	PART NUMBER	DESCRIPTION
1	04-1123	Terminal Block
2	01-4406	Washer
3	01-2604	Screw
4	04-1215	Wire Clip
5	01-2413	Screw
6	01-4411	Washer
7	40-0459-0-003	Bracket
8	01-2519	Screw
9	01-3401	Nut
10	04-1124	Fuse
11	01-4572	Washer
12	01-2450	Screw
13	40-0547	Actuator
14	40-0539	Switch
15	01-2530	Screw
16	01-4411	Washer
17	01-2433	Screw
18	40-0533	Switch

19	01-2411	Screw
20	41-0702-0-070	Bracket
21	30-0259	Switch
22	41-0456-0-070	Bracket
23	40-0578	Switch
24	42-0578	Switch
25	01-2481	Terminal Screw
26	01-1436	Screw
27	01-5515	Spring
28	40-0580-1	Actuator
29	41-0579	Block
30	41-0677	Retainer
32	42-0715	Stop
33	01-2557	Screw
34	41-0682	Pointer
35	04-1223	Wire Clip
36	42-0262-0-130	Jumper
38	32-2120	Bracket
39	01-2558	Screw



DET.	PART NUMBER	DESCRIPTION
01	42-0154-1	Looper Arm
	42-0154-2-050	Looper Arm Asm.
02	32-2065-0-050	Crank Asm.
03	01-6464	Roll Pin
04	40-0444	Looper Crank, Nut
05	40-0445-1-800	Bearing Holder
06	01-7413	Bearing
07	01-6703	Rollpin
08	01-6543	Pin
09	01-2469	Screw, Rear
10	01-4402	Washer
11	01-6454	Retaining Ring
12	01-4578	Lockwasher
13	32-2064	Looper
14	01-2561	Screw
15	01-2421	Screw
16	40-0059	Support
17	42-0063-1-050	Looper Shaft Asm.
18	01-6827-1	Pin
19	01-6551	Shaft Retainer
20	01-2442-0-001	Set Screw
21	42-1041	Spacer Nut
22	42-1040	Sleeve
23	01-2407	Screw, Front
24	32-2063	Looper Holder (pair)
26	01-2431	Screw
27	32-2040	Knife (3/8")
27	32-2067	Knife (7/16")
27	32-2061	Knife (1/2")
27	32-2125	Knife (5/8")
27	32-2126	Knife (3/4")
27	32-2119	Knife (7/8")
28	01-1683	Screw
29	32-2062	Knife Bracket

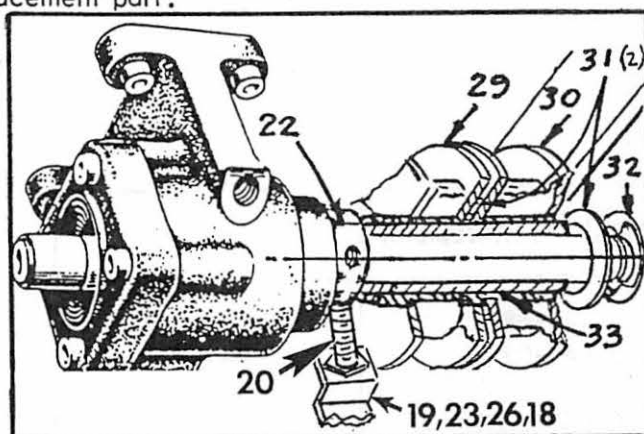
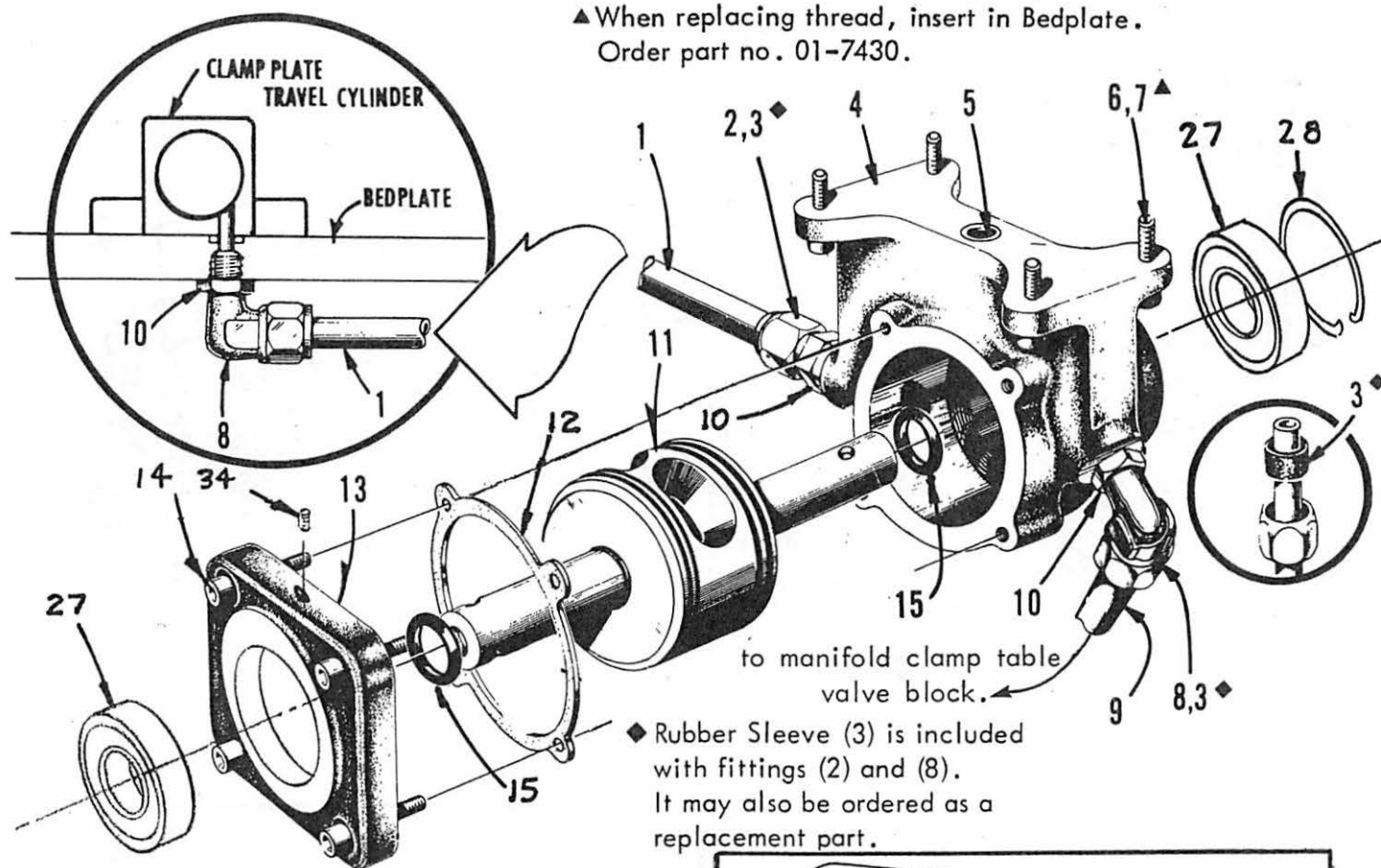




DET.	PART NUMBER	DESCRIPTION			
01	01-4004	Lockwasher	22	40-0151-0-050	Needle Bar Asm.
02	01-2430	Screw	23	01-7408	Bearing
03	32-2176-0-050	Eccentric & Shaft Asm.	24	30-0145-1	Driver Drum
04	20-0623	Bearing	25	30-0143-2	Clutch Release Dog
05	01-7409	Needle Bearing	26	01-5441	Spring
06	01-2427	Screw	27	30-0146	Ring
07	30-0141-0-050	Clutch Sleeve Asm.	28	01-7409	Needle Bearing
08	01-7411	Bearing	29	30-0131	End Support
09	30-0142	Driving Drum	30	05-0088-0-350	Belt (60 Hz)
10	01-4011	Washer		05-0088-0-360	Belt (50 Hz)
11	30-0134	Fitting	31	01-7431	Helicoil
12	30-0144-1	Clutch Dog Stop	32	01-7430	Helicoil
13	01-4003	Lockwasher			
14	01-2447	Screw			
15	30-0133	Center Support			
16	01-6419	Pin			
17	01-7412	Bearing			
18	01-2453	Screw			
19	01-2408	Screw			
20	01-8400	Key			

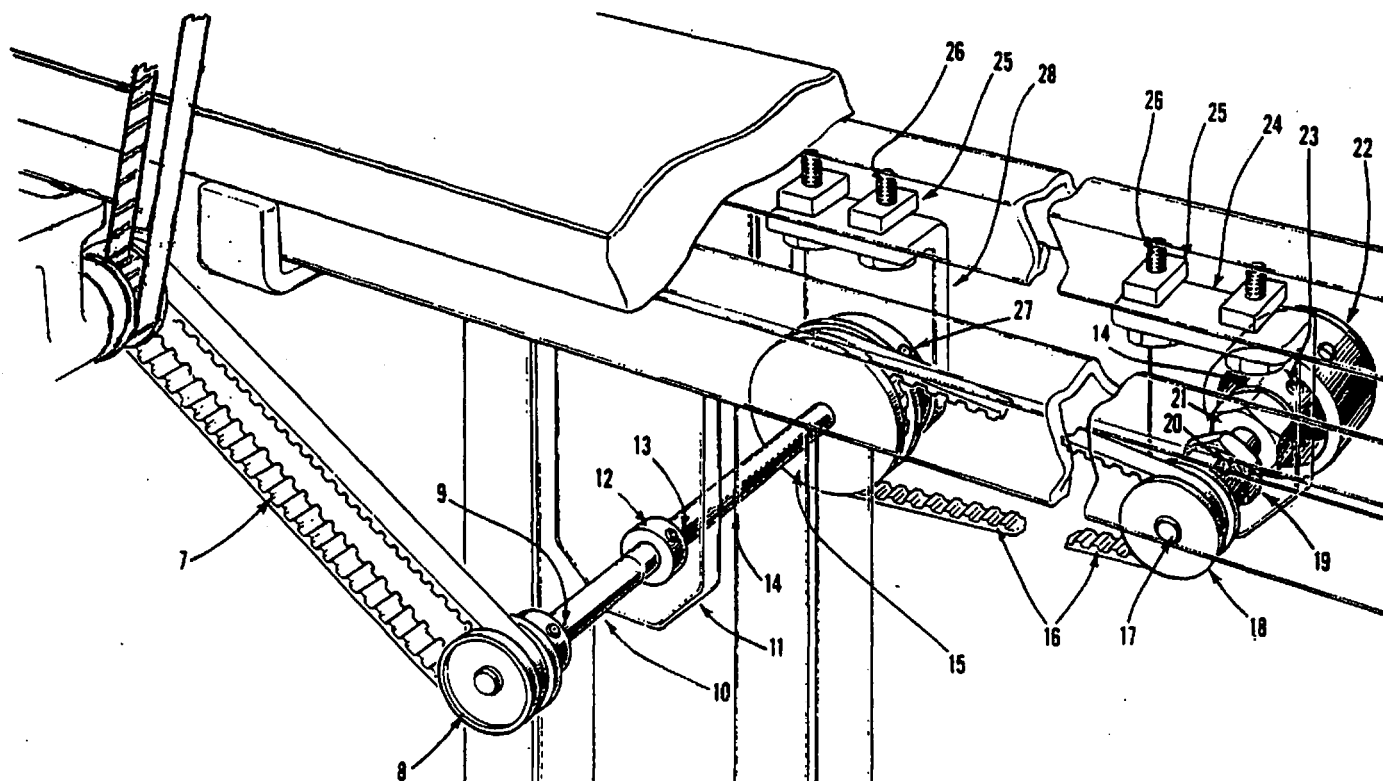


▲ When replacing thread, insert in Bedplate.  
Order part no. 01-7430.



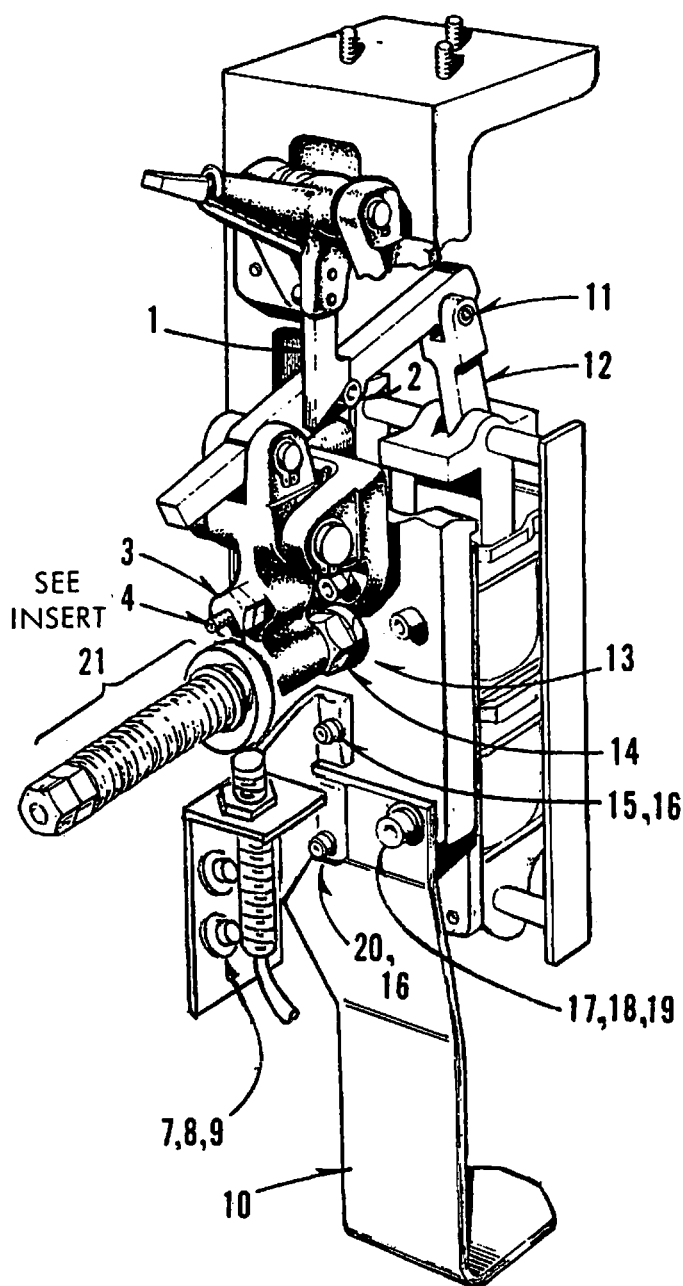
DET.	PART NUMBER	DESCRIPTION
01	40-0513	Tube
02	30-0310	Straight Fitting
03	30-0226	Rubber Sleeve
04	32-2006	Valve Case
05	01-4480	'O' Ring
06	01-2425	Screw
07	01-7430	Thread Insert
08	30-0218	Elbow Fitting
09	40-0512	Tube
10	01-3424	Nut
11	32-2007	Rotor
12	30-0181	Gasket
13	32-2008	Cover
14	01-2447	Screw
15	01-4302	Quad Ring
18	01-4411	Washer
19	32-0555	Bracket
20	32-0557-0-100	Timing Prox.
21	01-2456	Screw
22	30-0556	Timing Cam

23	01-2411	Screw
26	01-4406	Lockwasher
27	01-7313-0-001	Bearing
28	01-6847-0-003	Retaining Ring
29	32-2005	Drive Pulley
30	32-2003-0-050	One-Way Pulley
31	01-4560	Washer
32	01-6502-0-002	Retaining Ring
33	32-2002	Hub Shaft
34	01-2442-0-001	Screw

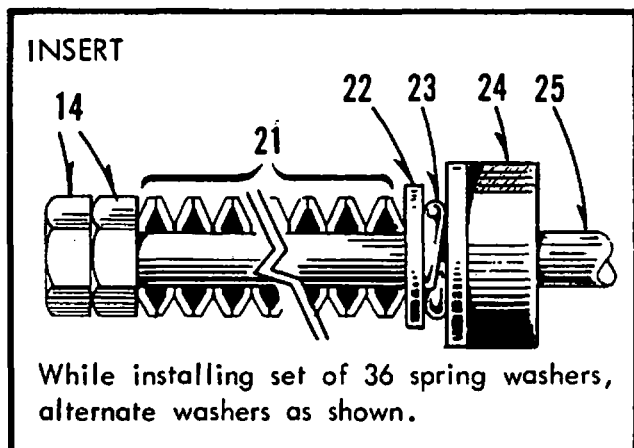


DET.	PART NUMBER	DESCRIPTION
7	42-0892	Timing Belt
8	42-0287	Timing Pulley
9	01-2559	Set Screw
10	42-0881	Pulley Shaft
11	42-0880-1	Bracket
12	42-0888	Collar
13	01-2408	Set Screw
14	01-6561	Retaining Ring
15	42-0883	Timing Pulley
16	42-0891	Timing Belt
17	42-0887	Shaft
18	42-0893	Timing Pulley
19	01-3463	Nut
20	01-2521	Set Screw

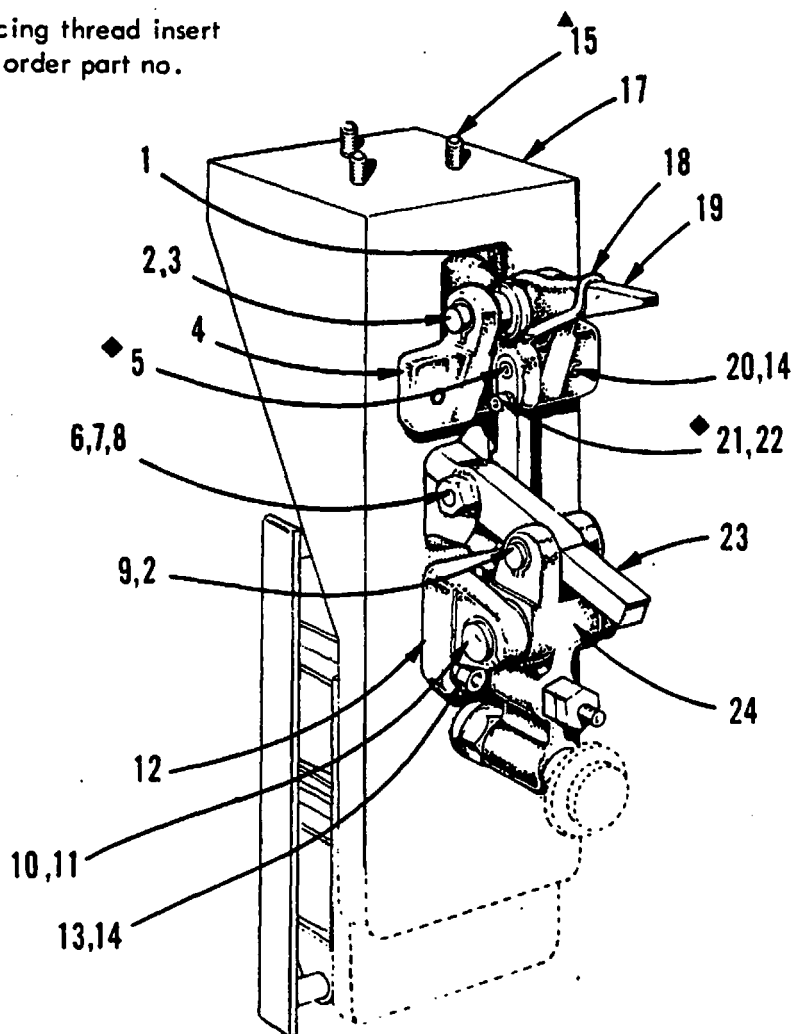
21	42-0886	Bearing
22	42-0290-1	Handwheel
23	01-2409	Set Screw
24	42-0869	Bracket
25	04-0467	Nut Block
26	01-2455-0-001	Screw
27	01-2787	Set Screw
28	42-0861	Bracket



DET.	PART NUMBER	DESCRIPTION
01	30-0174	Lever
02	01-2412	Screw
03	01-3404	Nut
04	01-2434	Screw
05	40-0695	Bracket
06	32-0557-0-100	Pickup Prox.
07	01-2413	Screw
08	01-4411	Washer
09	01-3401	Nut
10	40-0610	Bracket
11	01-6456	Roll Pin
12	30-0175	Link
13	01-4422	Lockwasher
14	01-3406	Nut
15	01-2413	Screw
16	01-4406	Lockwasher
17	01-2437	Screw
18	01-4003	Lockwasher
19	01-4404	Washer
20	01-2411	Screw
21	42-0989-0-050	Set of 36 (01-5521) Spring Washer
22	01-4491	Spacer
23	01-5458	Spring
24	32-0565	Prox. Actuator
25	01-1443	Stud



▲When replacing thread insert  
in Bedplate order part no.  
01-7431.

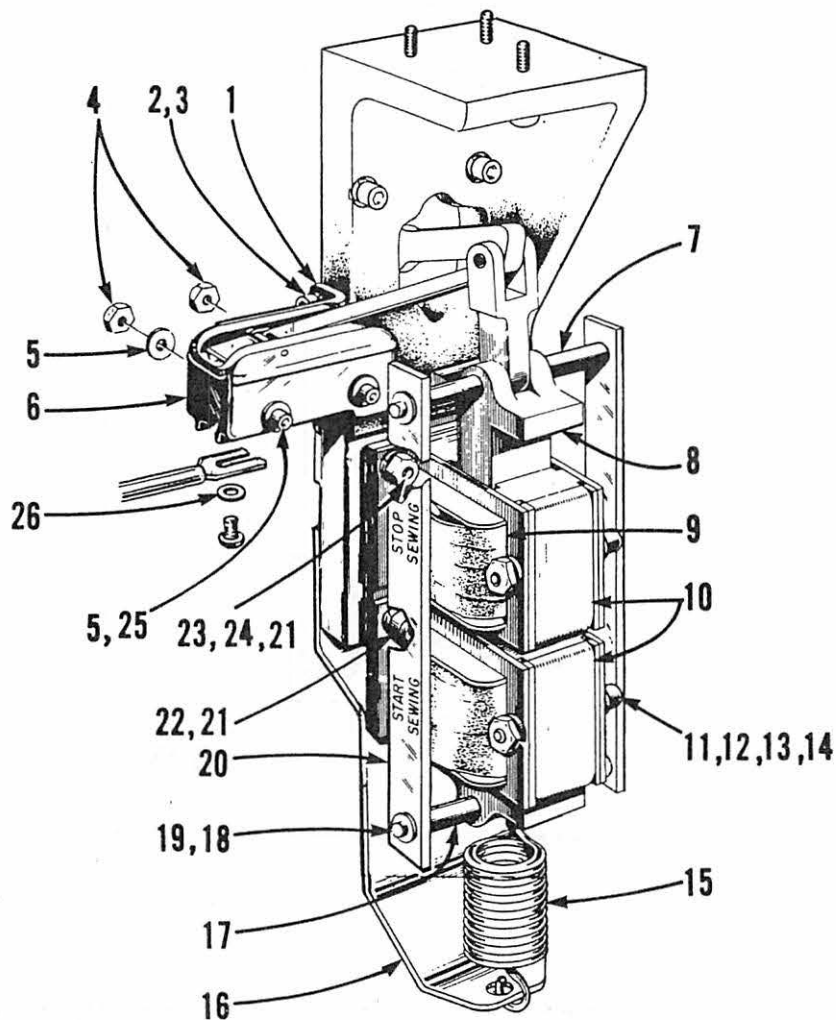


◆Apply 05-0192  
"Loctite" cement  
at these screws.

DET.	PART NUMBER	DESCRIPTION
1	01-4410	Spacer
2	01-6423	Truarc
3	01-6431	Pin
4	30-0162	Bracket
5	01-2415	Screw
6	01-3402	Nut
7	01-4407	Washer
8	01-2412	Screw
9	01-6432	Pin
10	01-6434	Pin
11	01-6433	Truarc
12	30-0163	Bracket

13	01-2447	Screw
14	01-4003	Lock Washer
15	01-2449	Screw
17	40-0161	Bracket
18	01-5409	Spring
19	30-0160	Dog
20	01-2437	Screw
21	01-2402	Screw
22	01-4405	Lock Washer
23	30-0168	Clutch Dog
24	30-0169	Arm

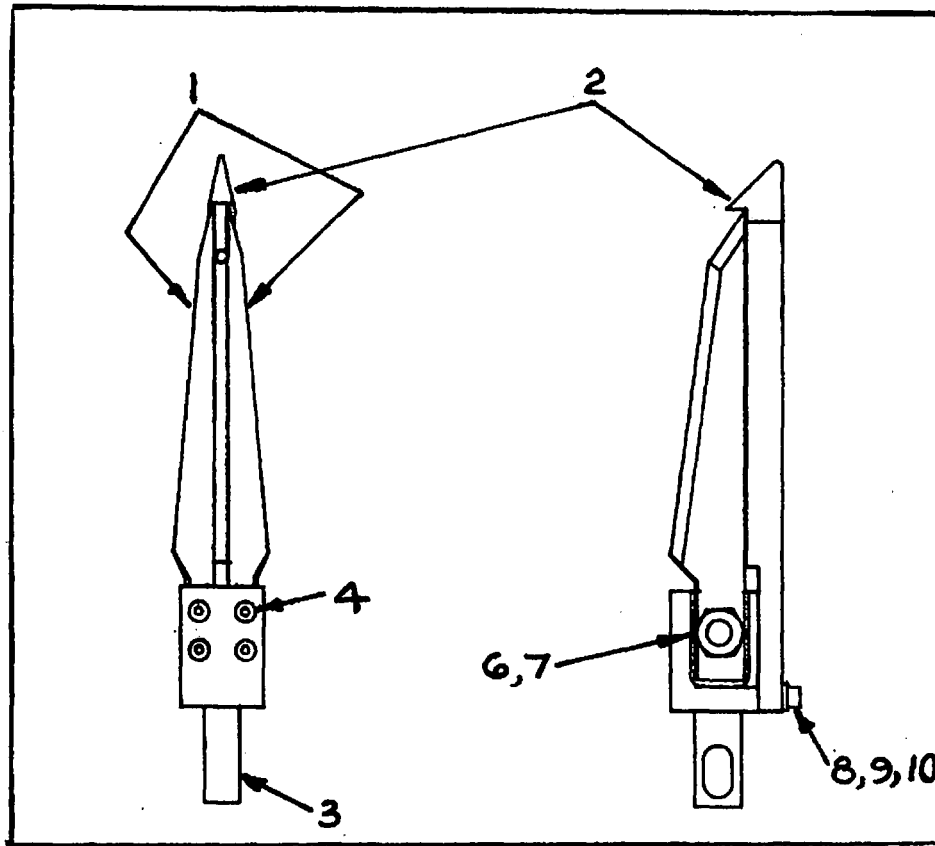




DET.	PART NUMBER	DESCRIPTION
1	40-0454	Bracket
2	01-2411	Screw
3	01-4406	Lock Washer
4	01-3401	Nut
5	01-4411	Washer
6	30-0265	Switch
7	01-4510	Spacer
8	30-0280	Solenoid Unit (60 Hz)
	30-0280-0-001	Solenoid Unit (50 Hz)
9	30-0390	Replacement Coil
	30-0390-0-001	Replacement Coil
		(50 Hz)
10	31-0390	Single Solenoid
		(60 Hz)
	31-0390-0-001	Single Solenoid
		(50 Hz)

11	01-2542	Screw
12	01-4407	Lockwasher
13	01-3402	Nut
14	01-4018	Lockwasher
15	01-5453	Spring
16	40-0610	Bracket
17	01-4459	Spacer
18	01-6551	Retaining Ring
19	01-6589	Pin
20	30-0409	Link
21	01-4003	Lockwasher
22	01-2602	Screw
23	01-3404	Nut
24	01-2446	Screw
25	01-2433	Screw
26	01-4473	Lockwasher (3 used at this switch only)

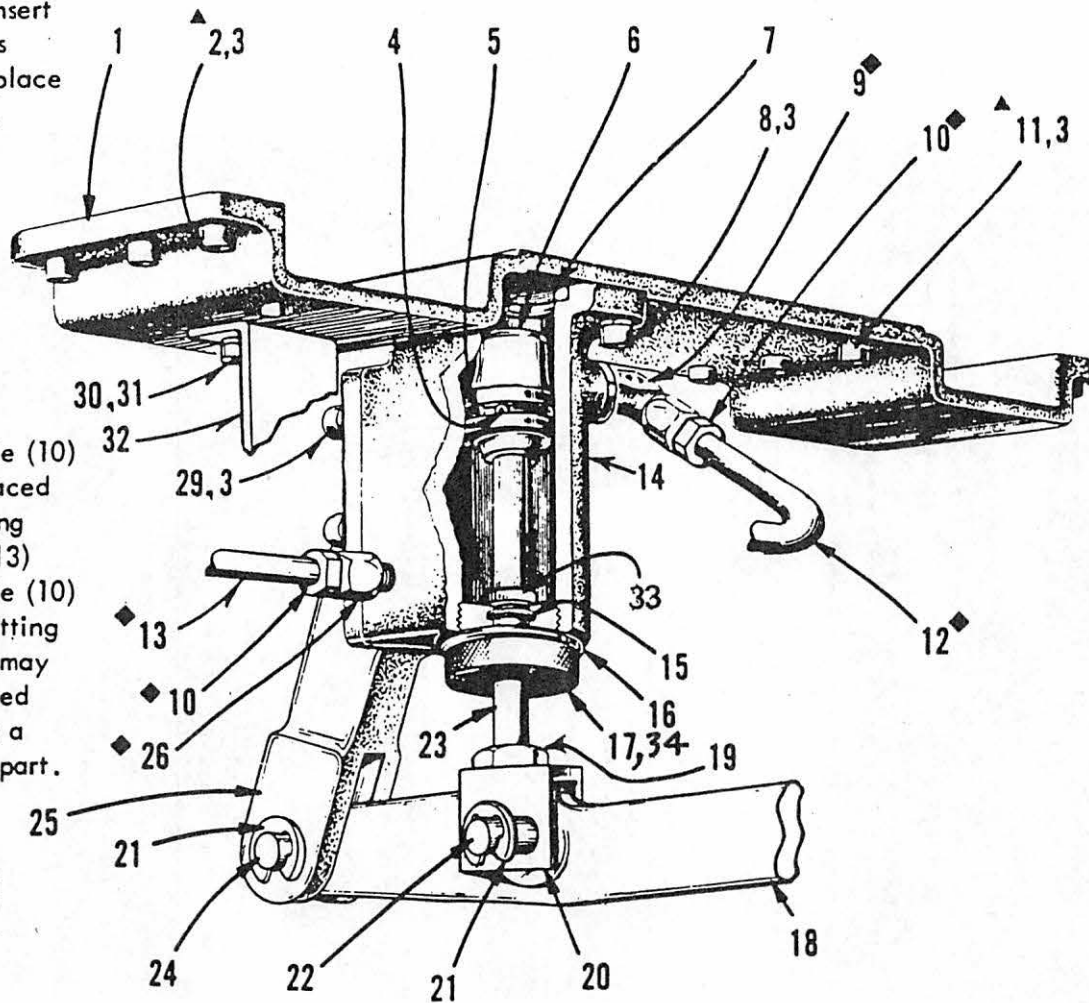




ITEM	ITEM NO.	3/8"	7/16"	1/2"	5/8"	3/4"	7/8"
TAB KNIFE ASM.	1	32-2047-1-050	32-2047-1-050	32-2047-1-050	32-2048-1-050	32-2048-1-050	32-2048-1-050
POINTER ASM.	2	32-2045-0-050	32-2045-0-050	32-2045-0-050	32-2045-0-050	32-2045-0-050	32-2045-0-050
HOLDER	3	32-2044-0-050	32-2046-0-050	32-2046-0-050	32-2049-0-051	32-2049-0-052	32-2049-0-053
SCREW	4	01-1956-0-000	01-1956-0-000	01-1956-0-000	01-1956-0-000	01-1956-0-000	01-1956-0-000
NUT	6	01-3074-0-000	01-3074-0-000	01-3074-0-000	01-3074-0-000	01-3074-0-000	01-3074-0-000
WASHER	7	01-4537-0-000	01-4537-0-000	01-4537-0-000	01-4537-0-000	01-4537-0-000	01-4537-0-000
SCREW	8	01-2334-0-000	01-2334-0-000	01-2334-0-000	01-2334-0-000	01-2334-0-000	01-2334-0-000
WASHER	9	01-4528-0-000	01-4528-0-000	01-4528-0-000	01-4528-0-000	01-4528-0-000	01-4528-0-000
WASHER	10	01-4015-0-000	01-4015-0-000	01-4015-0-000	01-4015-0-000	01-4015-0-000	01-4015-0-000

▲ When steel insert in Bedplate is damaged, replace with part no. 01-7452

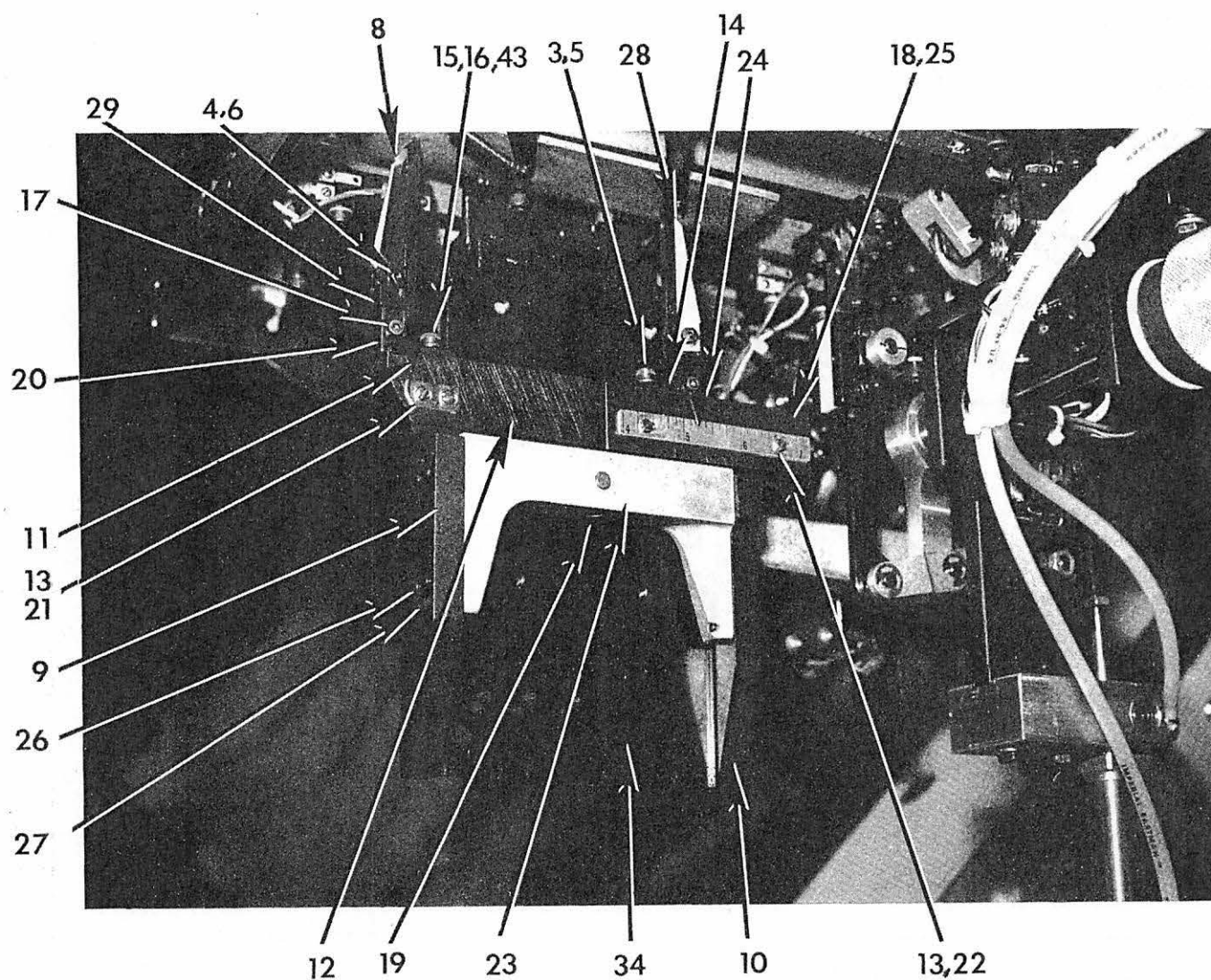
◆ Nut & Ferrule (10) must be replaced when changing tubes (12 & 13) Nut & Ferrule (10) are part of fitting (9 & 26) but may also be ordered separately as a replacement part.



DET.	PART NUMBER	DESCRIPTION
1	42-0450	Bracket
2	01-2425	Screw
3	01-4003	Lock Washer
4	01-6564	Roll Pin
5	01-4451	"O" Ring
6	41-0474-1	Piston
7	01-4438	"O" Ring
8	01-2404	Screw
9	40-0218-1	Elbow Fitting
10	40-0575-2	Nut and Ferrule
11	01-2407	Screw
12	42-0952	Copper Tube
13	42-0953	Copper Tube
14	40-0249-1	Cylinder
15	01-4480	"O" Ring
16	30-0194	Gasket

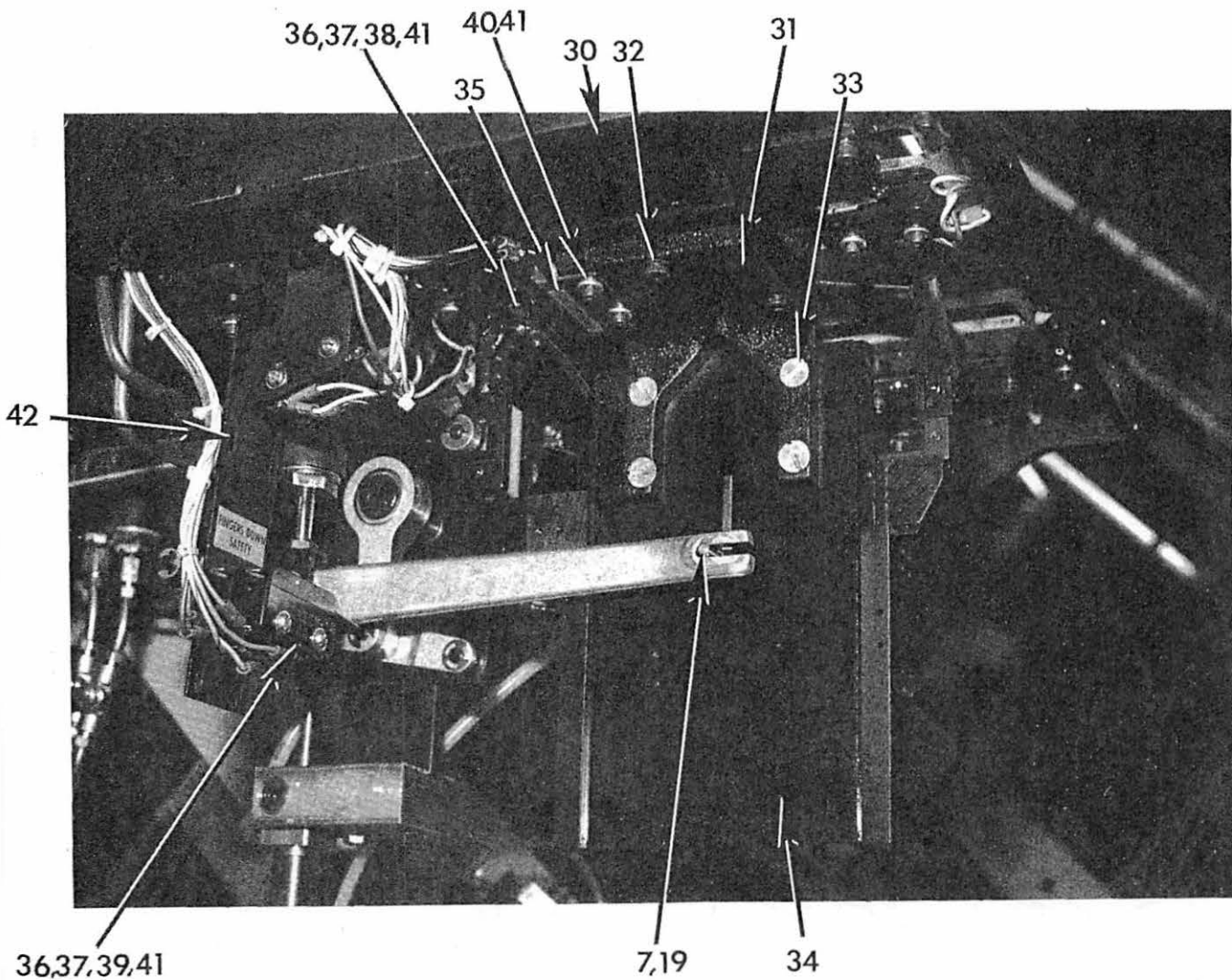
17	42-1058	Cap Asm.
18	40-0308	Folding Lever
19	01-3427	Nut
20	41-0247	Connector
21	01-6475	Retaining Ring
22	01-6503	Pin
23	41-0248	Piston Rod
24	01-6482	Pin
25	40-0309	Bracket
26	40-0310-1	Straight Fitting
29	01-2493	Screw
30	01-2411	Screw
31	01-4411	Washer
32	40-0457	Bracket
33	44-0533	Spacer
34	01-4301	'U-Cup' Seal





Det.	Part Number	Description	Det.	Part Number	Description
01	01-1956	Screw	12	42-0438	Front Finger Shoe Gib
03	01-2334	Screw	13	01-2481	Screw
04	01-3074	Nut	14	30-0114	Back Finger Shoe
05	01-4528	Washer	15	01-2423	Screw
06	01-4537	Washer	16	01-4002	Washer
07	01-6706	Pin	17	01-2413	Screw
08	32-2045-0-050	Pointer	18	40-0438-1	Back Shoe Gib
09	42-1519	Front Guide	19	01-2408	Screw
10	42-1520	Back Guide	20	30-0115	Front Finger Shoe
11	42-0387	Pointer	21	42-0389	Gauge
			22	40-0388	Scale
				40-0388-0-017	Scale, Metric 10-18cm

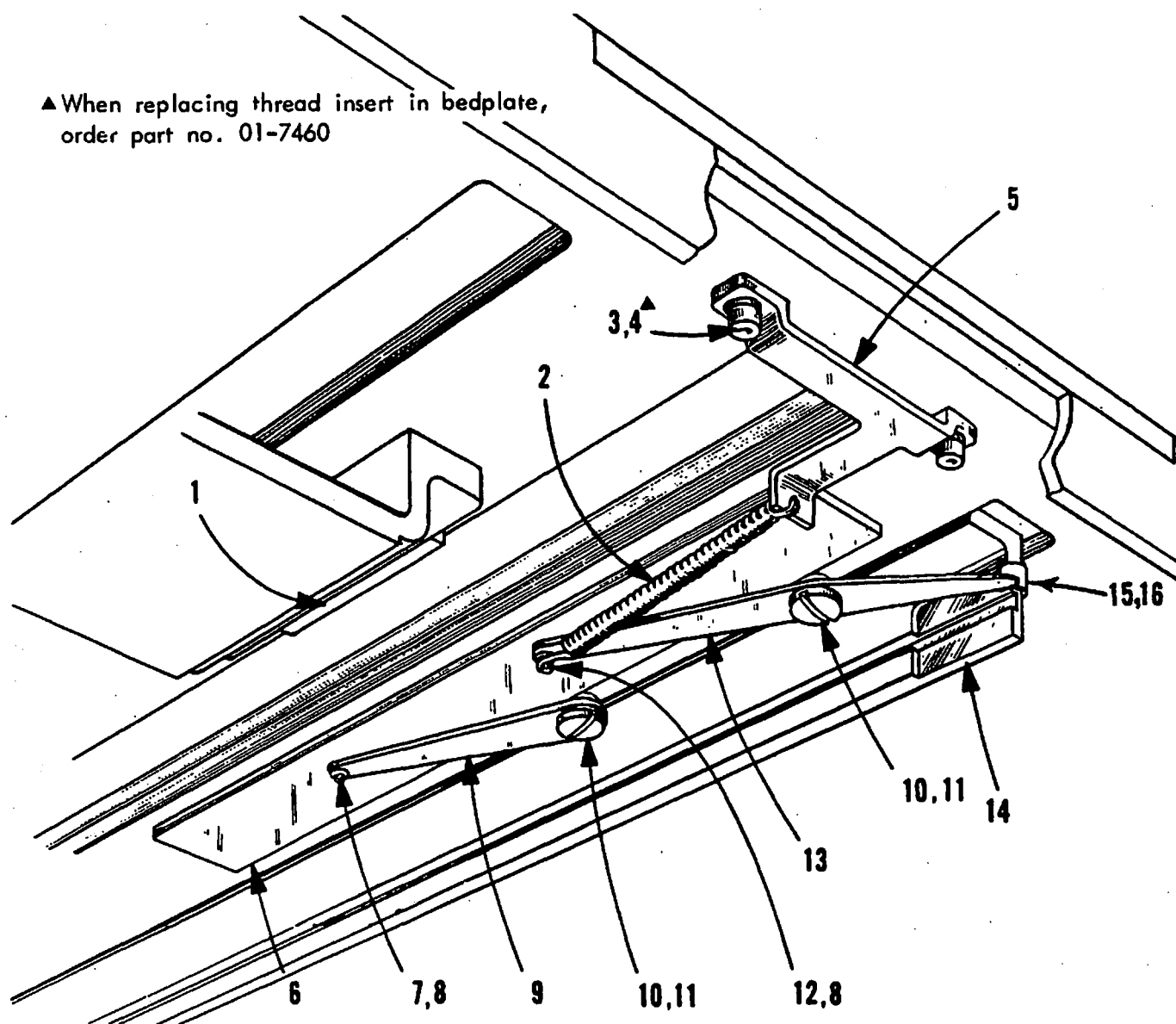




Det.	Part Number	Description
23	42-1282	Spacer Block
24	40-0387	Pointer
25	01-2435	Screw
26	01-2639	Screw
27	01-2412	Screw
28	see Page 30	Tab Knives
29	32-2046	Knife Holder
30	41-0449	Bracket
31	40-0119	Bracket
32	01-2421	Screw
33	01-2422	Screw

Det.	Part Number	Description
34	32-2187-0-000	Cam Plate
35	40-0461	Bracket
36	40-0533	Switch
37	01-3401	Nut
38	01-2433	Screw
39	01-2519	Screw
40	01-2411	Screw
41	01-4411	Washer
42	40-0457	Bracket
43	30-0386	Slide Nut

▲ When replacing thread insert in bedplate,  
order part no. 01-7460

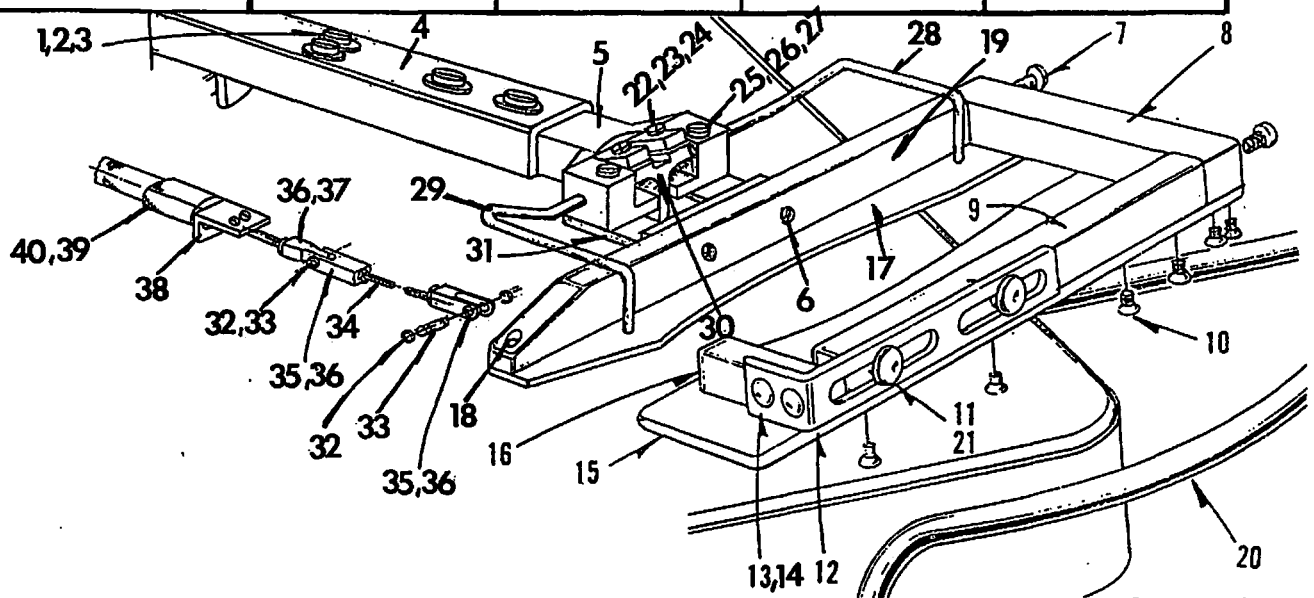


DET.	PART NUMBER	DESCRIPTION
1	40-0625	Pad
2	01-5436	Spring
3	01-2411	Screw
4	01-4406	Lock Washer
5	41-0624	Bracket
6	41-0621	Slide Plate
7	01-6539	Pin
8	01-6368	Retaining Ring
9	41-0623	Lever
10	01-2578	Screw
11	01-7454	Spacer

12	01-6538	Pin
13	41-0622	Lever
14	41-0451-0-001	Bracket, right
15	01-7456	Roller
16	01-6565	Pin



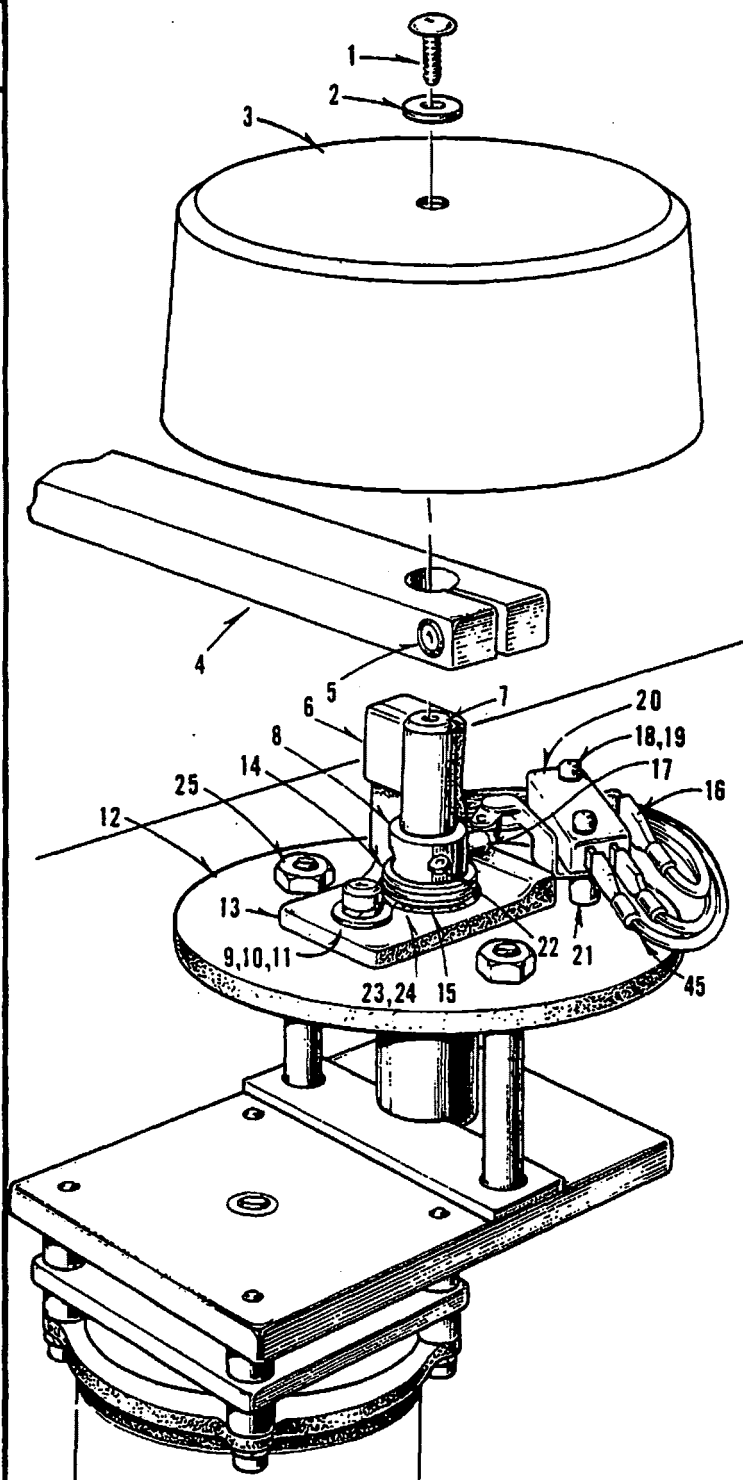
WELT STYLE (W =)	AUTOMATIC PATCH LOADING TRAY ASSEMBLIES			
	ASSEMBLY	TRAY PLATE, left (15)	TRAY PLATE, right (17)	BACK BLOCK (8)
690, 730	40-0515-1-050	40-0830-0-187	40-0831-0-187	40-0515-1-275
759, 786, 850	40-0515-1-052	40-0830-0-187	40-0831-0-062	40-0515-1-275
801, 945	40-0515-1-054	40-0830-0-438	40-0831-0-938	40-0515-1-300
Above models equipped with 6" trays except 801 & 945	41-0515-0-051	40-0830-0-438	40-0831-0-938	40-0515-1-275



DET.	PART NUMBER	DESCRIPTION
1	01-2247	Screw
2	01-4572	Lock Washer
3	01-4579-0-003	Washer
4	44-2102-1	Arm
5	44-2075	Neck
6	01-2545	Screw
7	01-2712	Screw
8	See Chart	Back Block
9	40-0832-0-002	Tray Rail, Left
10	01-2488	Screw
11	01-2633	Screw
12	40-0514-1	Tray Ear
13	01-2597	Screw
14	01-4528	Lock Washer
15	See Chart	Tray Plate, Left
16	40-0841	Patch Holder
17	See Chart	Tray Plate, Right
18	01-2472	Screw

19	40-0832-0-001	Tray Rail, Right
20	42-0927	Patch Loader Guard
21	01-4412	Washer
22	01-2246-0-001	Screw
23	01-4729	Washer
24	01-4673	Lock Washer
25	01-2599-0-102	Screw
26	01-4072	Washer
27	01-4571	Lock Washer
28	32-2152	Clamp - Long
29	32-2153	Clamp - Short
30	44-2076	Tray Yoke
31	32-2151	Bracket
32	01-6368	Retaining Ring
33	01-6943	Pin
34	44-2082	Threaded Rod
35	44-2079	Clevis
36	01-3414	Nut
37	44-2078	Cylinder Clevis
38	44-2077	Bracket
39	07-0388	Cylinder
40	07-0387	Elbow - 90 deg. Barb

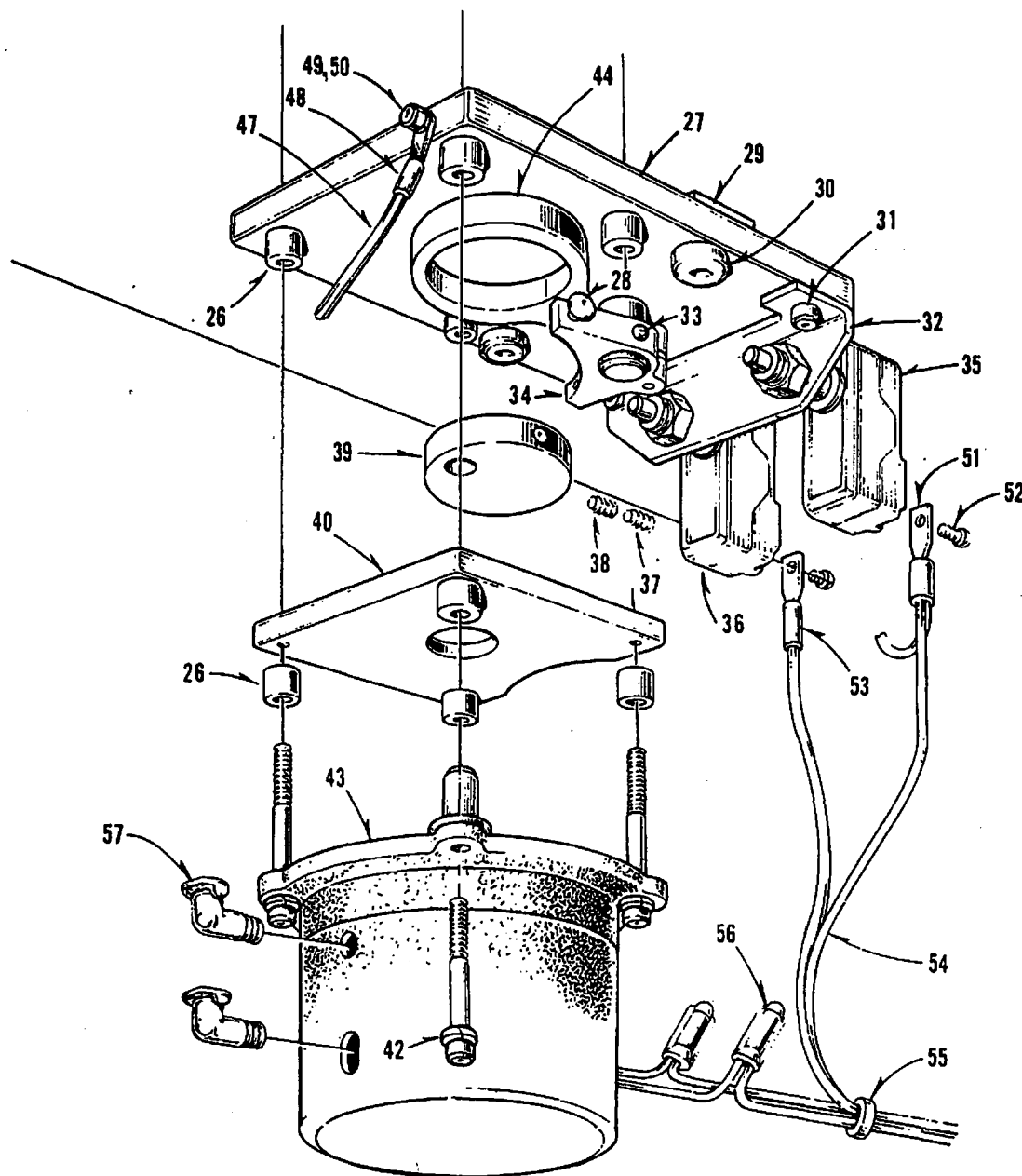
DET.	PART NUMBER	DESCRIPTION
1	01-2536	Screw
2	01-4404	Washer
3	32-2134	Cover
4	44-2102-1	Loader Arm
5	01-2449	Screw
6	40-0773	Stop Pad
7	42-0498	Shaft
8	40-0496-1	Collar
9	01-2460	Screw
10	01-4422	Lock Washer
11	01-4491	Washer
12	42-0877	Mounting Flange
13	42-0769	Stop
14	01-4493	Race (2 used)
15	01-7458	Bearing
16	04-0258-0-187	Wire Terminal
17	01-2672	Set Screw
18	01-2783	Screw
19	01-4405	Lock Washer
20	04-1301	Automatic Sew Switch
21	42-0876	Spacer
22	01-2522	Set Screw
23	01-4507	"O" Ring (outer)
24	01-4450	"O" Ring (inner)
25	01-3406	Lock Nut
26	01-7475	Spacer
27	40-0775-0-850	Mounting Plate
28	01-2596	Screw
29	40-0772	Spacer
30	01-1460	Screw
31	01-2410	Screw
32	40-0502-1	Bracket
33	01-6420	Roll Pin
34	40-0500-1-050	Actuator
35	40-0531	Loader Motor Switch
36	40-0501	Patch Loader Switch
37	01-2673	Set Screw
38	01-2674	Set Screw
39	40-0777	Eccentric
40	40-0771	Guide Plate
42	01-4407	Lock Washer
43	04-0285-1	Patch Loader Motor (60 hertz)
	04-0285-1-001	Patch Loader Motor (50 hertz)

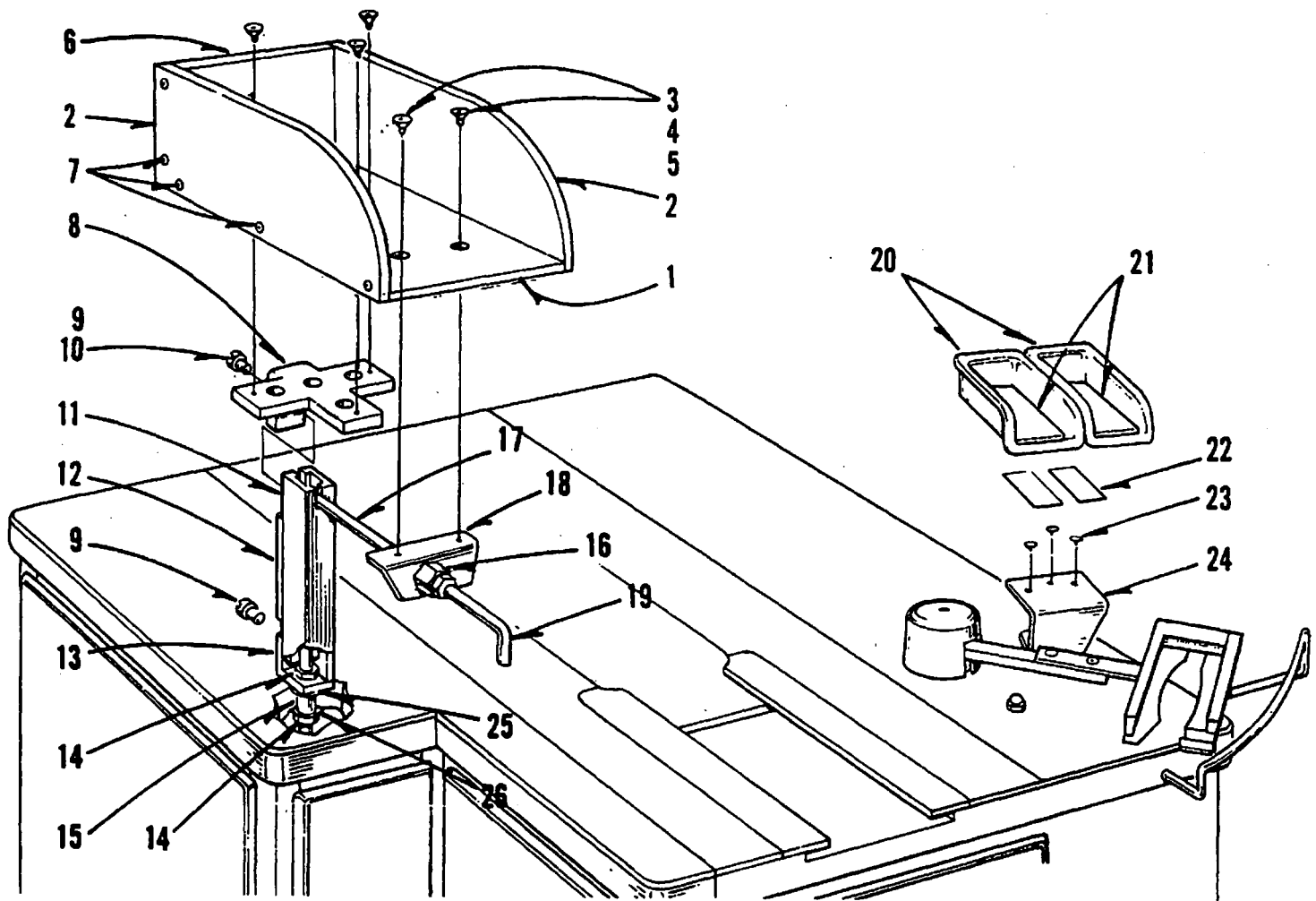


44	40-0776	Eccentric Arm
45	42-0262-0-115	Loader Sewing Harness

47	42-0262-0-155	Jumper
48	30-0278	Wire Terminal
49	01-2804	Screw
50	01-4572	Lock Washer
51	04-0129	Wire Terminal
52	01-2432	Screw (only one used at this position)
53	30-0261	Wire Terminal

54	42-0262-0-114	Loader Motor Harness
55	05-0394	Tie
56	05-0369	Wire Connector
57	30-0011	Oil Cup

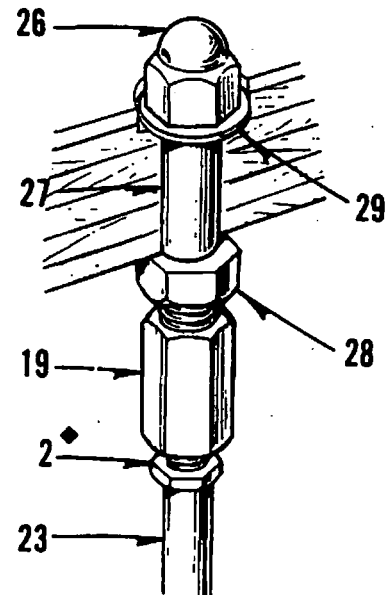
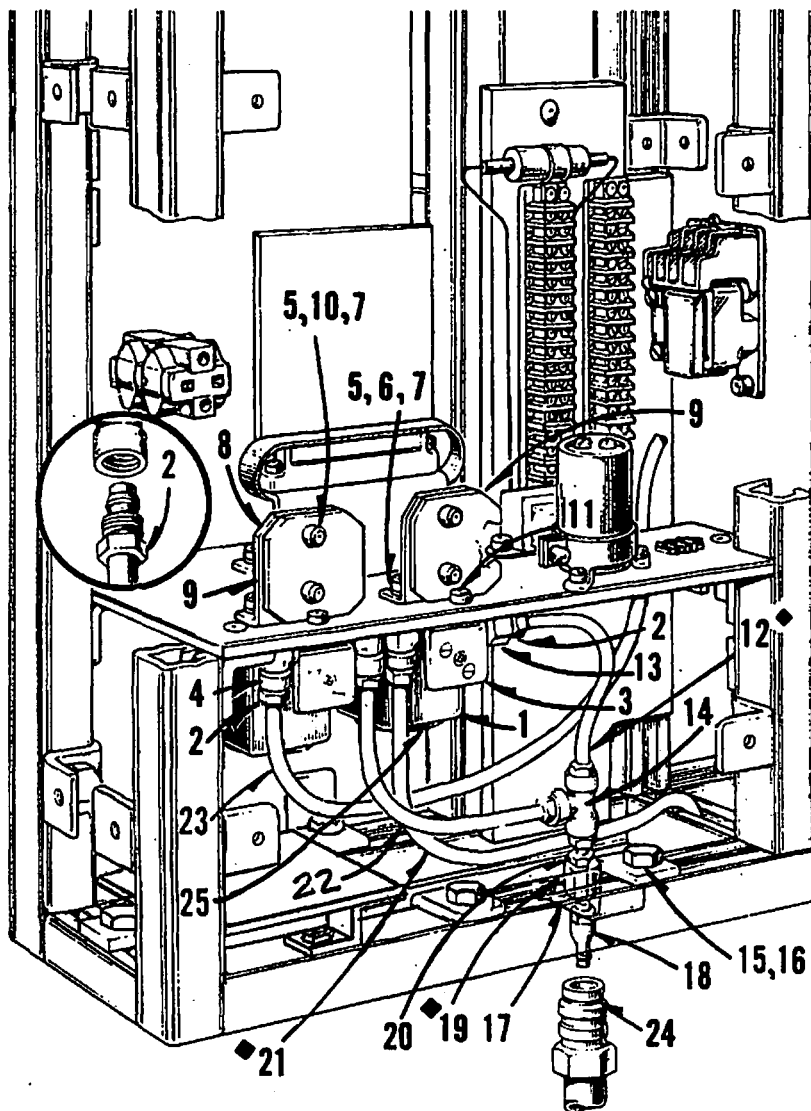




DET.	PART NUMBER	DESCRIPTION
1	32-2163	Bottom Tray
2	32-2161	Side Tray
3	01-2583	Screw
4	01-4407	Lock Washer
5	01-3001	Nut
6	32-2162	Back Tray
7	01-2706	Screw
8	32-2166	Bracket
9	04-0396	Screw
10	04-0467	Nut Block
11	32-2164	Column
12	04-0490-0-071	Cover
13	04-0388	Angle
14	01-3419	Lock Nut
15	42-0924	Nipple
16	42-0930	Union

17	07-0294	Tubing, 80"●
18	42-0929	Bracket
19	40-0816	Air Nozzle
20	32-2170	Patch Tray (7/16"-1/2")
	42-0637-0-450	Patch Tray (5/8"-7/8")
21	40-0640	Pad (7/16")
	42-0640	Pad (7/16"-1/2") using 3"patches
	41-0640	Pad (5/8"-7/8")
22	42-0931	Tape, 3-3/8"●
23	01-2616	Screw
24	32-2167-0-050	Patch Tray Base Asm.
25	01-4569	Felt Washer
26	01-4500	Spacer

● Available in multiples of one foot.

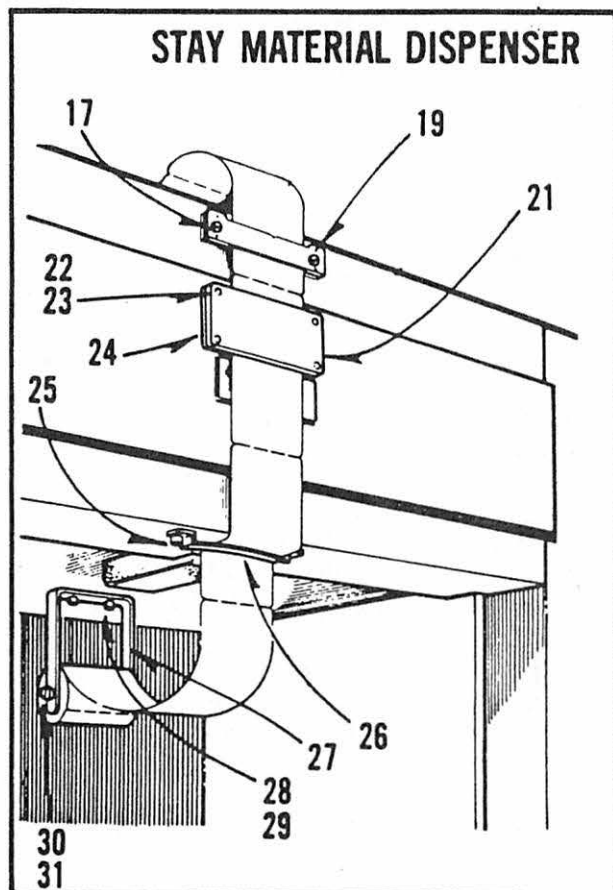
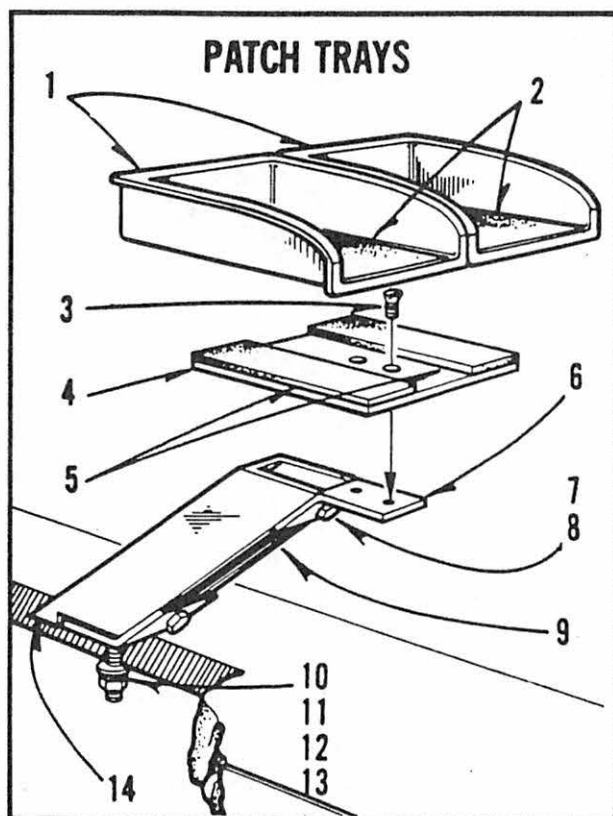


◆ When replacing tubing (12), (21), (22), and (23), also replace nut (2). This nut (2) is included with (4), (13), (14), and (19), but can be ordered separately.

DET.	PART NUMBER	DESCRIPTION			
01	04-1052	Solenoid Valve	17	42-0919	Bracket
02	40-0575-2	Nut, Replacement Part	18	04-2003	Plug
03	04-1053	Bracket	19	42-0908	Tube Fitting
04	40-0218-1	Elbow Fitting	20	07-0294	Tube
05	01-2437	Screw	21	07-0294	Tubing, 80" ●
06	01-4003	Lockwasher	22	07-0294	Tubing, 13" ●
07	01-3404	Nut	23	07-0294	Tubing, 30" ●
08	42-0905	Bracket	24	04-2004	Coupler
09	04-0326-0-050	Unloader Circuit Board	25	04-1083	Bushing
10	01-7489	Spacer	26	01-3465	Air Nozzle
11	01-2493	Screw		42-0945	Plug (req'd when air not used)
12	07-0294	Tubing, 10"	27	42-0910	Air Tube
13	40-0310-1	Connector	28	01-3008	Nut
14	40-0519-2	'T' Connector	29	01-4010	Washer
15	04-0396	Screw			
16	04-0467	Nut			

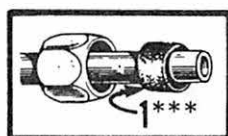
● Available only in multiples of one foot.





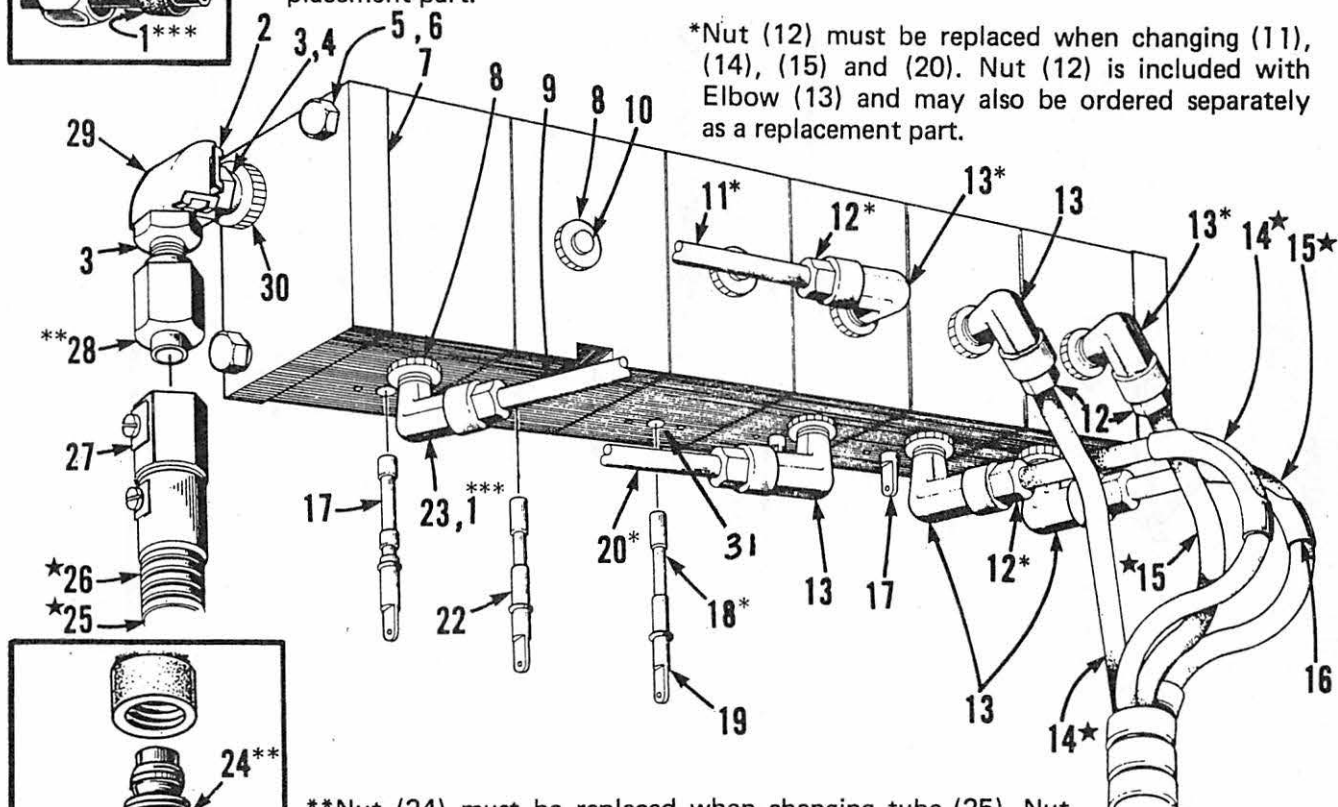
DET.	PART NUMBER	DESCRIPTION
1	32-2170	Patch Tray (7/16"-1/2") used with 3" patches
	42-0637-0-450	Patch Tray (5/8"-7/8")
2	40-0640	Pad (7/16"
	42-0640	Pad (7/16"-1/2") used with 3" patches
	41-0640	Pad (5/8" - 7/8")
3	01-2416	Screw
4	42-0942	Base
5	42-0931	Tape, 6"●
6	42-0939	Angle Bracket
7	04-0396	Screw
8	04-0467	Nut
9	04-0490-0-073	Closure
10	01-2798	Screw
11	01-3467	Nut
12	01-4567	Lock Washer
13	01-4568	Washer
14	32-2173	Unistrut
17	01-3426	Nut
19	01-2591	Screw
21	04-1319-0-002	Name Plate
22	01-2592	Screw
23	01-4411	Spacer
24	42-0948	Name Plate Spacer
25	01-2410	Screw
26	41-0584	Holder Bar
27	42-0582	Bracket w/PL
	40-0582	Bracket w/o PL
28	01-2436	Screw
29	01-4407	Washer
30	01-2083	Screw
31	40-0583	Roller w/PL
	41-0583	Roller w/o PL

● Available in multiples of one foot.

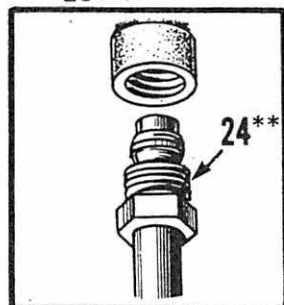


\*\*\*Sleeve (1) is included with elbow fitting (23) and may also be ordered separately as a replacement part.

\*Nut (12) must be replaced when changing (11), (14), (15) and (20). Nut (12) is included with Elbow (13) and may also be ordered separately as a replacement part.



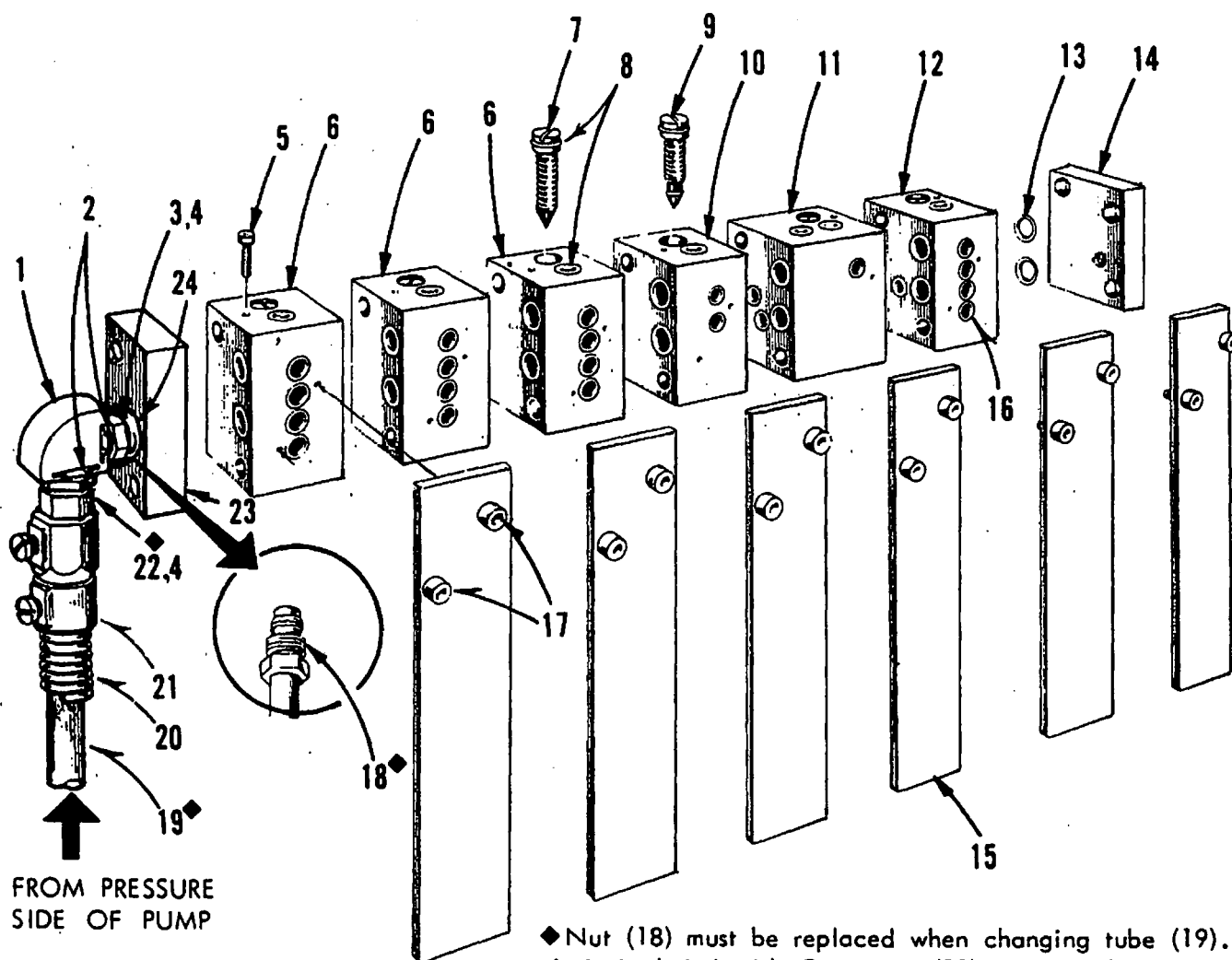
\*\*Nut (24) must be replaced when changing tube (25). Nut (24) is included with Connector (28) and may be ordered separately as a replacement part.



DET.	PART NUMBER	DESCRIPTION
1	30-0226	Sleeve
2	42-0913	Clip
3	42-0914	"O" Ring
4	42-0911	Connector
5	01-2540	Bolt
6	01-4578	Lockwasher
7	40-0603	Slide Plate (L.H.)
8	01-3424	Nut
9	40-0512	Copper Tube
10	01-2438	Plug
11	42-0952	Copper Tube
12	40-0575-2	Nut & Ferrule
13	07-0568	Elbow
14	07-0294★	Tubing, 34"
15	07-0294★	Tubing, 31"
16	40-0564	Tube Bending Clip
17	42-1048	Plunger

18	42-1049	Plunger
19	01-4483	"O" Ring
20	42-0953	Copper Tube
22	42-1050	Plunger
23	30-0218	Elbow
24	40-0574	Nut
25	40-0826★	Tubing, 30"
26	40-0594★	Autoflex, 34"
27	42-0598	Coupling
28	07-0420	Connector
29	42-0909	Elbow
30	01-3419	Nut
31	01-4300	"U" Cup Seal

★Available only in multiples of one foot.

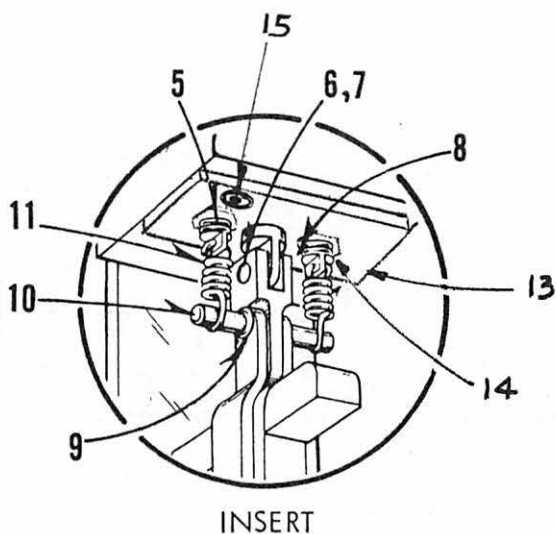
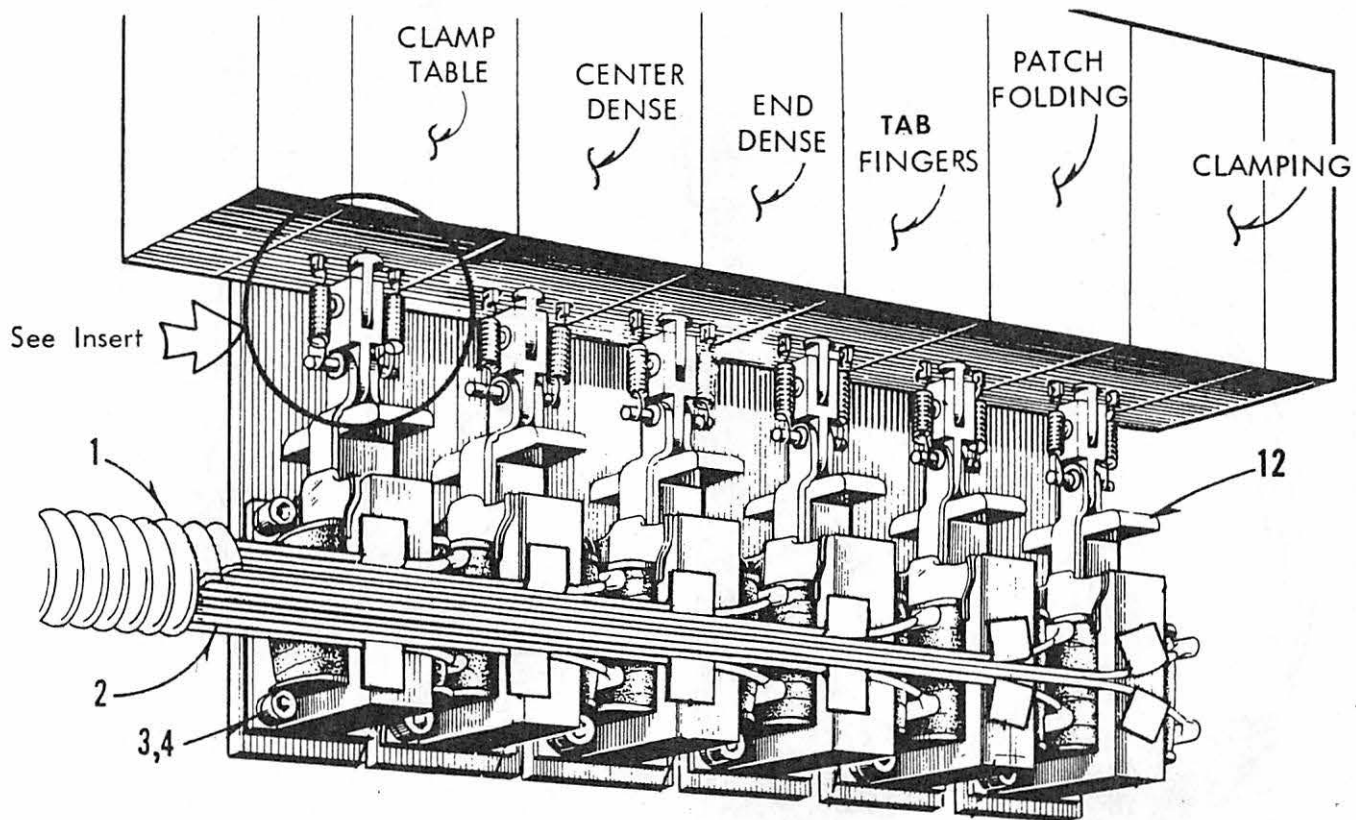


DET.	PART NUMBER	DESCRIPTION
1	42-0909	Elbow
2	42-0913	Clip
3	42-0911	Connector
4	42-0914	"O" Ring
5	01-2421	Screw
6	42-1052	Valve Block
7	40-0524	Metering Pin (5 used)
8	01-4482	"O" Ring
9	40-0607	Metering Pin
10	42-1053	Valve Block
11	42-1054	Valve Block
12	42-1061	Valve Block
13	01-4428	"O" Ring
14	40-0603	Side Plate, left

15	40-0606	Cover Plate
16	01-4426	"O" Ring
17	01-2492	Screw
18	40-0574	Nut
19	40-0826**	Tubing, 27-1/2"
20	40-0594**	Autoflex, 40-1/2"
21	42-0598	Coupling
22	07-0420	Connector
23	40-0604	Side Plate, right
24	01-3419	Nut

\*\*Available only in multiples of one foot.

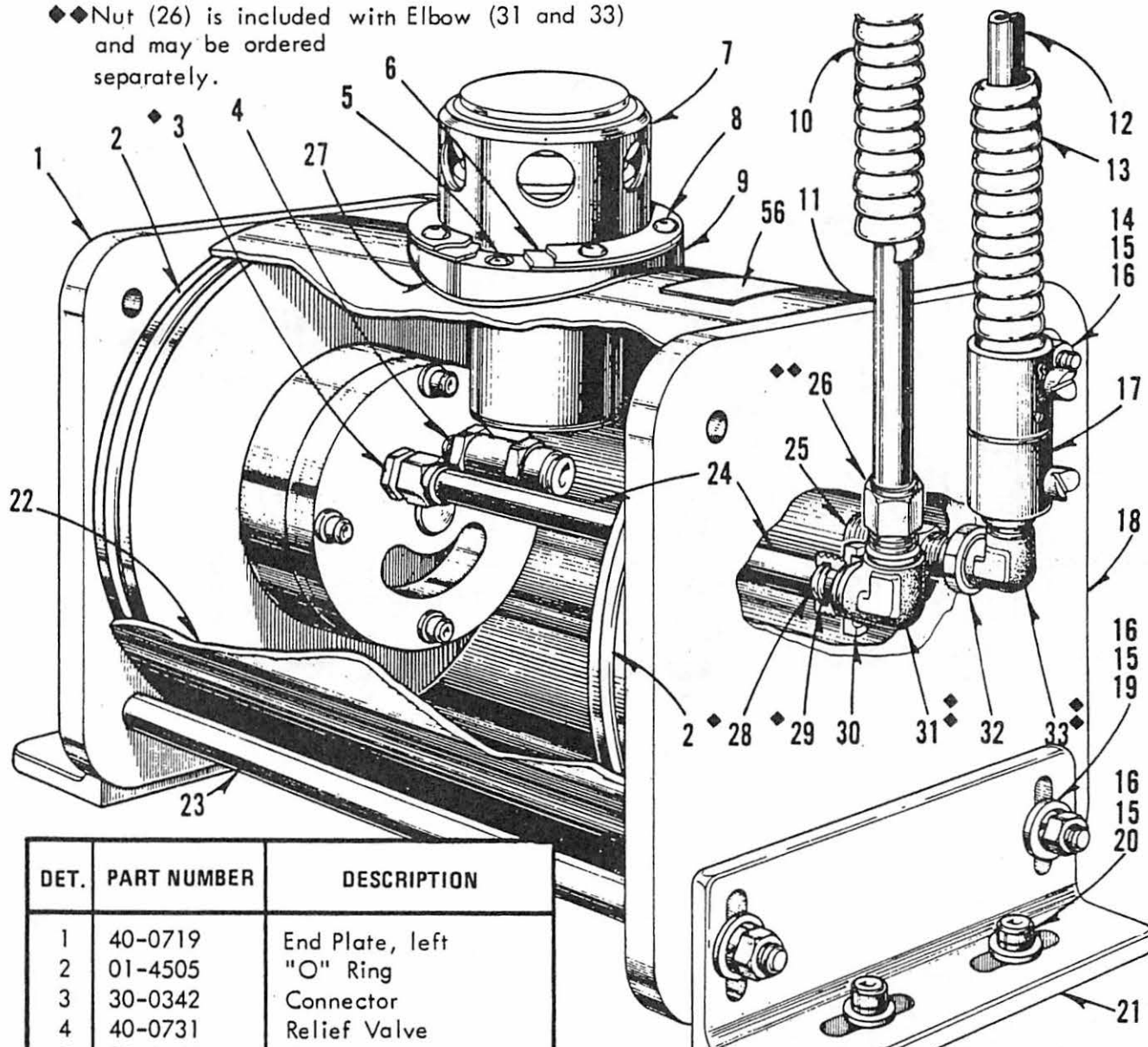




DET.	PART NUMBER	DESCRIPTION
1	40-0586**	"Spirap" - 24"
2	42-0262-3-116	Head Harness
3	01-2411	Screw
4	01-4406	Lockwasher
5	01-1422	Anchor
6	01-6549	Pin
7	01-6547	Retaining Ring
8	42-0525	Link
9	01-6551	Retaining Ring
10	01-6550	Pin
11	01-5425	Spring
12	40-0506	Solenoid
13	42-1051	Hold Down Plate
14	01-3401	Nut
15	01-2729	Screw

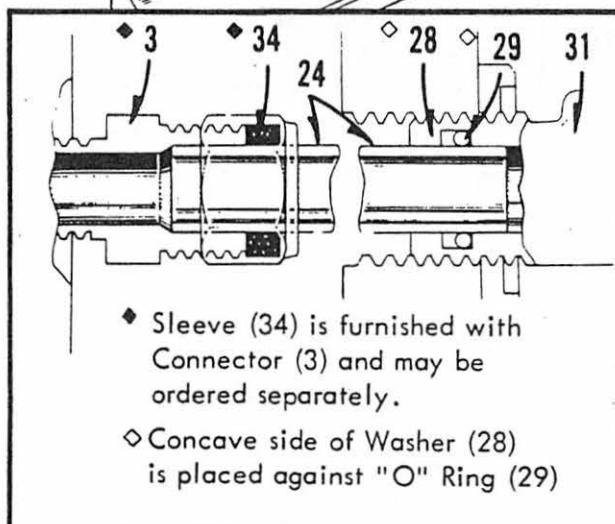
\*\*Available only in multiples of one foot.

◆◆Nut (26) is included with Elbow (31 and 33) and may be ordered separately.

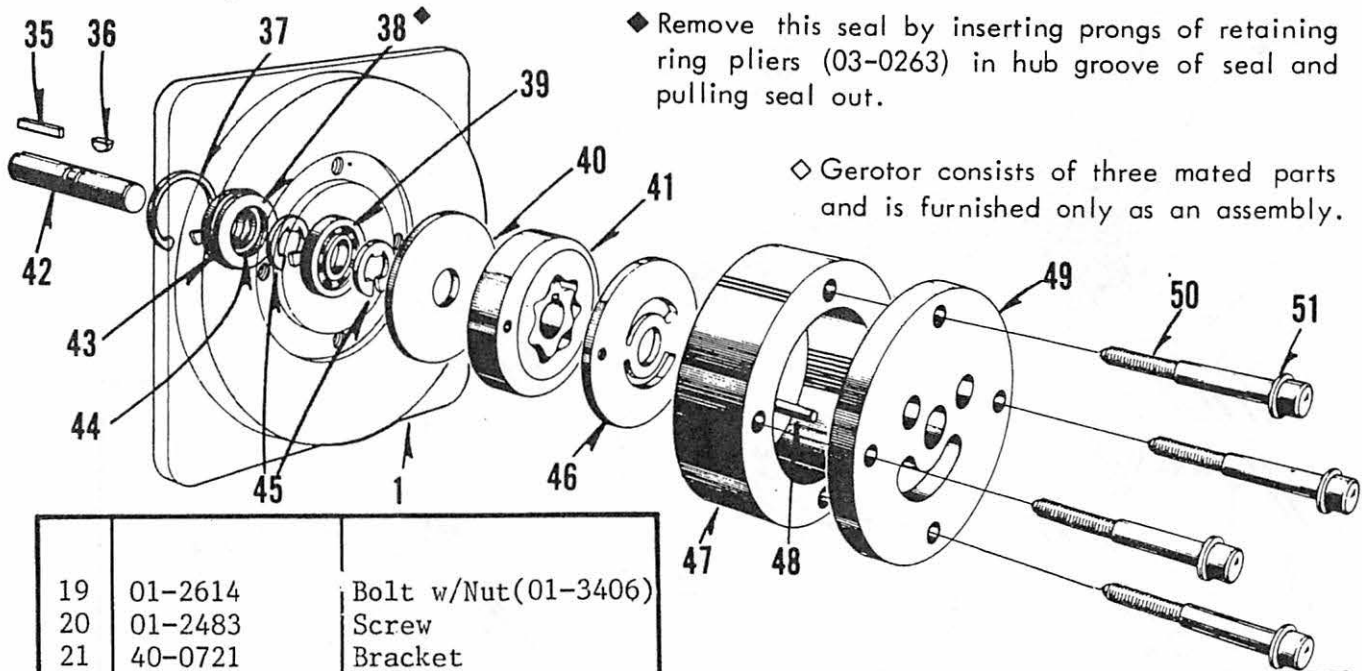


DET.	PART NUMBER	DESCRIPTION
1	40-0719	End Plate, left
2	01-4505	"O" Ring
3	30-0342	Connector
4	40-0731	Relief Valve
5	01-2654	Screw
6	40-1013	Gasket
7	40-0729	Filler Cap
8	01-2536	Screw
9	40-0722	Filler Base
10	40-0594**	Autoflex, 27-1/2"
11	40-0826**	Tubing, 27-1/2"
12	40-0826**	Tubing, 30"
13	40-0594**	Autoflex, 30"
14	01-2615	Bolt with Nut
15	01-3406	Nut
16	01-4422	Lock Washer
17	01-4400	Washer
18	40-0598	Coupling
19	40-0720	End Plate, right

\*\* Available only in multiples of one foot.

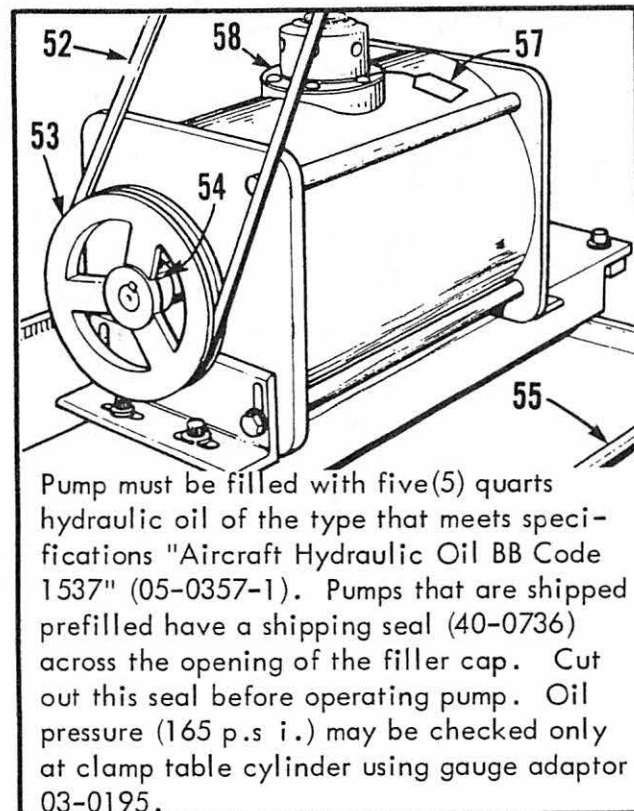


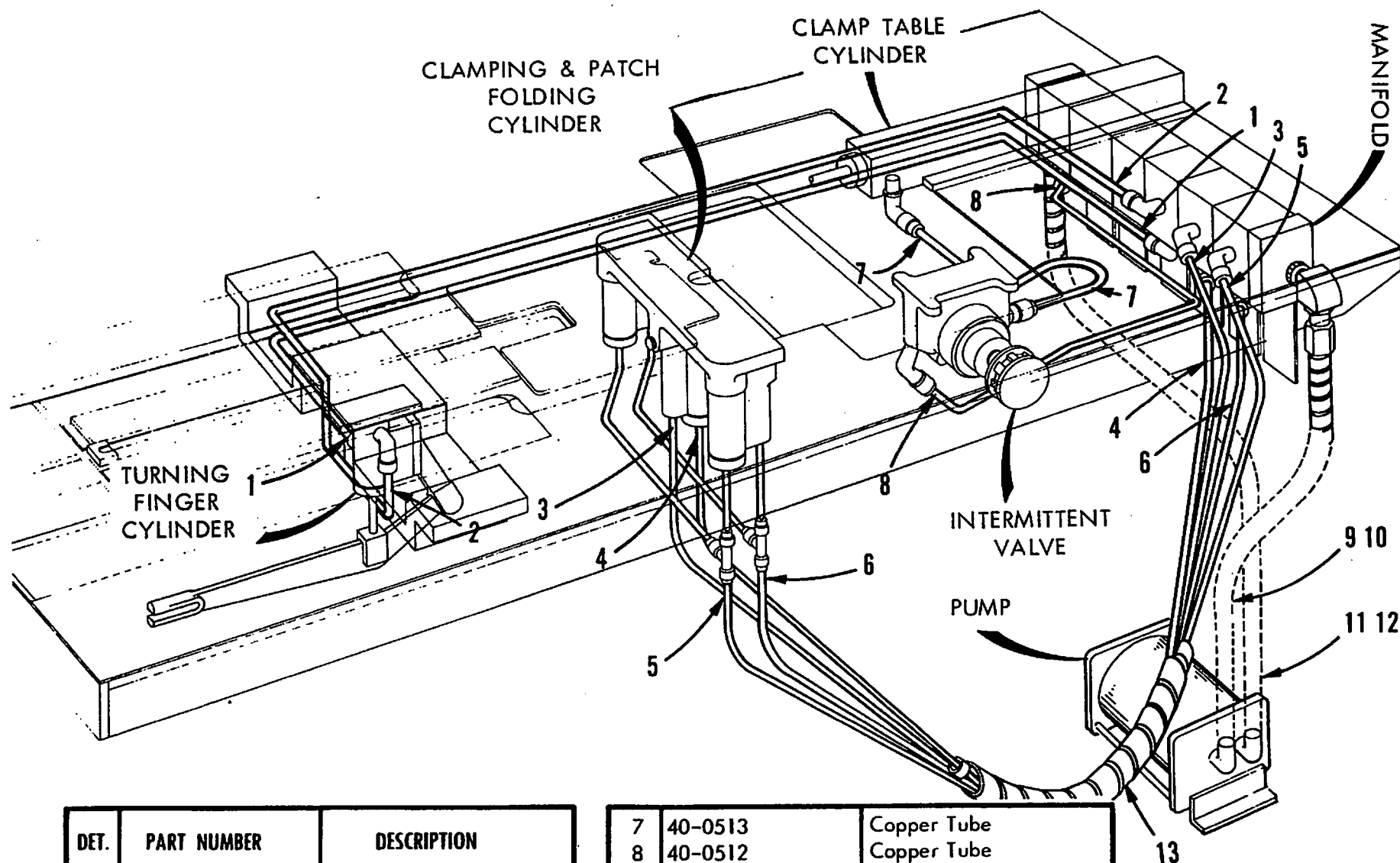




19	01-2614	Bolt w/Nut(01-3406)
20	01-2483	Screw
21	40-0721	Bracket
22	40-0718	Tank
23	40-0737	Tube
24	40-0734	Copper Tube
25	40-0730	Check Valve
26	40-0574	Ferruled Nut
27	40-0723	Gasket
28	01-4508	Back-up Washer
29	01-4428	'O' Ring
30	01-3441	Lock Nut
31	40-0733-1-050	Elbow
32	01-3419	Lock Nut
33	40-0236	Elbow
34	30-0226	Sleeve
35	01-8403	Square Key
36	01-8404	Woodruff Key
37	01-6585	Retaining Ring
38	40-0726	Shaft Seal
39	01-7465	Bearing
40	40-0732	Inner Disc
41	40-0728	Gerotor
42	40-0727	Shaft
43	01-4136	'O' Ring (outer)
44	01-4135	'O' Ring (inner)
45	01-6583	Retaining Ring
46	40-0735	Port Disc
47	40-0724	Gerotor Disc
48	01-6584	Pin
49	40-0725	Cover Plate
50	01-2613	Screw
51	01-4404	Lockwasher
52	05-0087-0-440	Belt (60 Hz.)
	05-0087-0-450	Belt (50 Hz.)

53	40-0347	Pulley
54	01-2573	Screw
55	42-0353	Oil Pan
56	05-0421	Label, Oil Spec.
57	05-0422	Tag
58	see Note	Shipping Seal



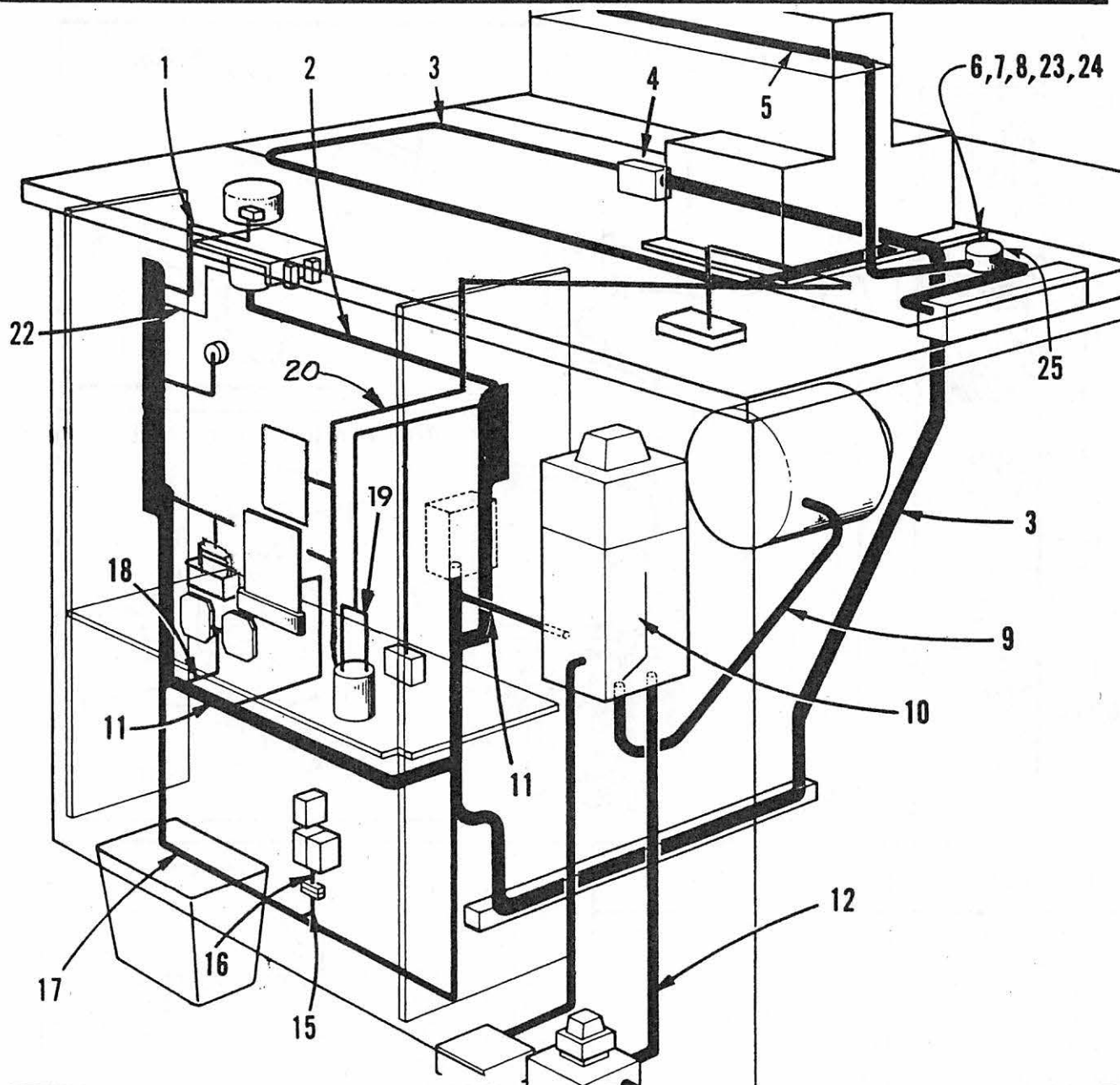


DET.	PART NUMBER	DESCRIPTION
1	42-0953	Copper Tube
2	42-0952	Copper Tube
3	07-0294	Tubing 34" ●
4	07-0294	Tubing 34" ●
5	07-0294	Tubing 31" ●
6	07-0294	Tubing 31" ●

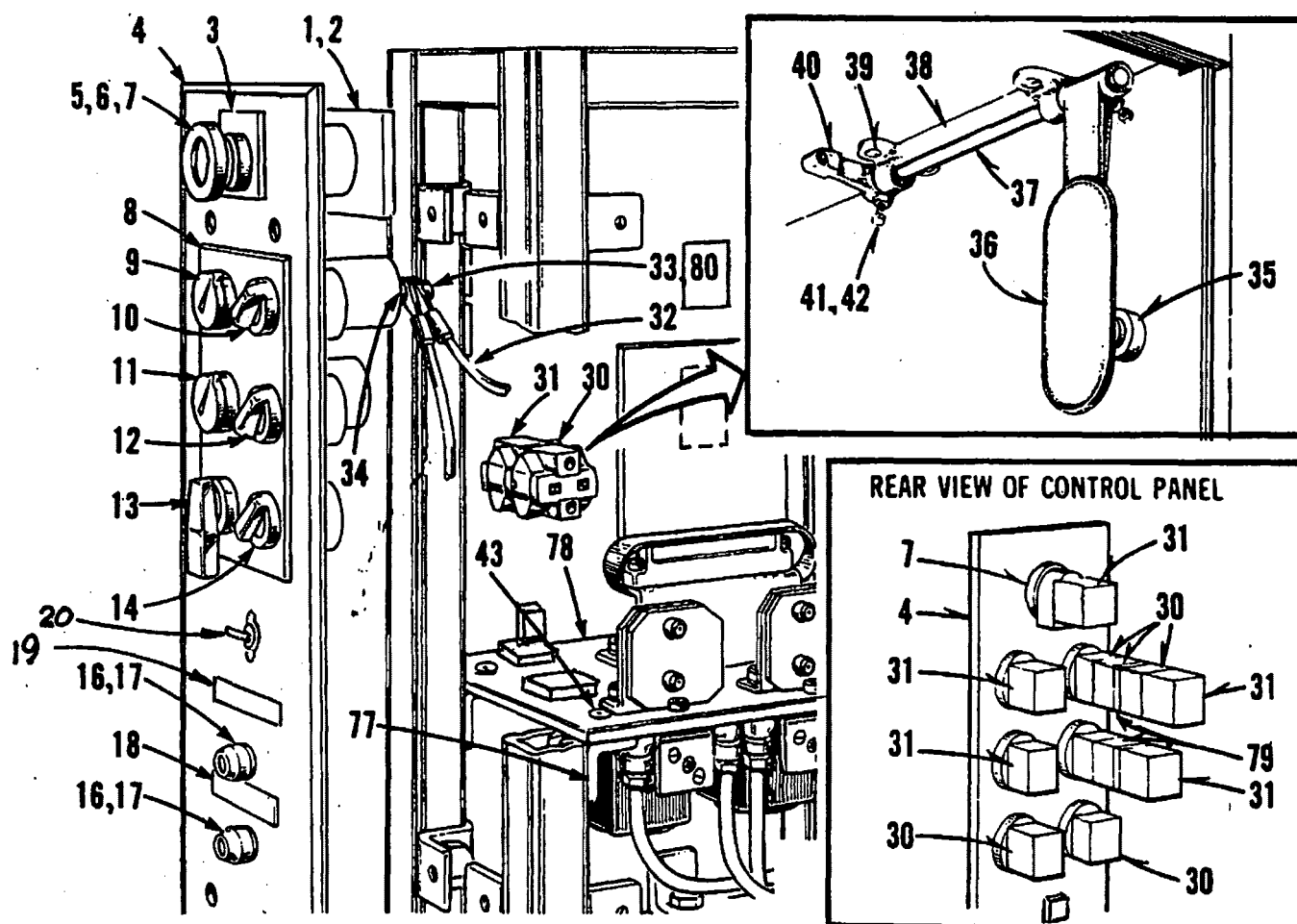
7	40-0513	Copper Tube
8	40-0512	Copper Tube
9	40-0594	Conduit 27-1/2" ●
10	40-0826	Tubing 27-1/2" ●
11	40-0594	Conduit 30" ●
12	40-0826	Tubing 30" ●
13	40-0586	Spirap 45" ●

● Available only in multiples of one foot



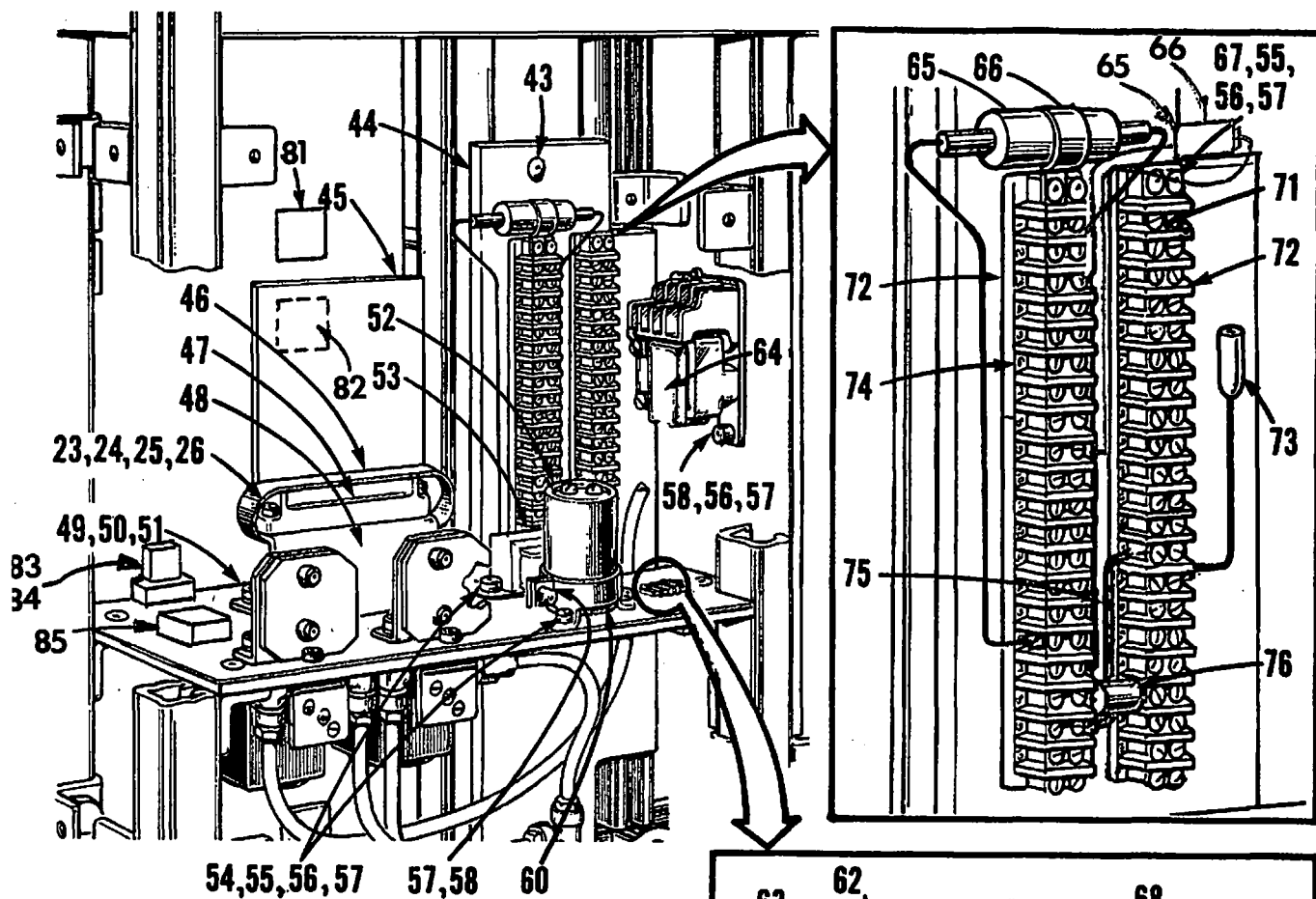


DET.	PART NUMBER	DESCRIPTION
01	42-0262-0-115	Loader Sewing Harness
02	42-0262-0-114	Loader Motor Harness
03	42-0262-2-110	Main Harness
04	01-6896-0-002	Rivet
05	42-0262-3-116	Head Harness
06	42-0046-0-050	Junction Box Asm.
07	01-2804	Screw
08	01-4572	Lockwasher
09	42-0262-0-118	Motor Harness
10	40-0262-0-133	Transformer Gnd.Wire
11	42-0262-1-119	Transformer Harness
12	42-0262-1-162	Circuit Breaker Harness
15	42-0262-0-161	Pedal Harness (female)
16	42-0262-0-112	Pedal Harness (male)
17	42-0262-0-117	Main Switch Harness
18	42-0262-0-160	Unloader Harness
19	42-0262-0-135	Capacitor Jumper Wire
20	32-0560-0-050	Prox. Thd. Pickup Harness
22	42-0262-0-155	Patch Loader Gnd.Wire
23	05-0369	Wire Nut
24	05-0370	Wire Nut
25	30-0047	Cover

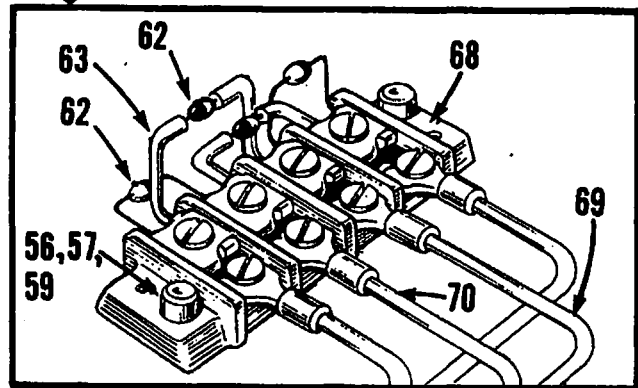


DET.	PART NUMBER	DESCRIPTION
01	32-3031	Guard
02	01-2569	Screw
03	42-0936	Main Switch Plate
04	04-0440	Control Panel
05	04-0452	On-Off Switch
06	04-0489	Lamp
07	(no part no.)	Washer (1 per switch)
08	42-0807	Switch Plate
09	04-0453	Selector Switch
10	04-0454	Clamp Safety Switch
11	04-0459	Loading Switch
12	04-0457	Loader Sew Switch
13	04-0456	Clamp Clearing Switch
14	04-0455	Fingers Switch
16	04-0482	Fuse Holder
17	04-0476-1	Fuse
18	05-0455	Decal
19	05-1187-1	Decal
20	06-0291	Switch - 3 position
23	01-2708	Screw
24	01-4401	Washer

25	01-4405	Lockwasher
26	01-3414	Nut
30	04-1057	Switch, replacement
31	04-1014	Switch, replacement
32	42-0262-0-155	Jumper, green
33	01-2803	Screw, cadmium
34	01-4570	Washer, brass
35	04-0458	Knee Switch
36	32-3035	Lever
37	40-0650	Shaft
38	32-3038	Bracket
39	01-2416	Screw
40	32-3036	Lever Actuator
41	01-2195	Screw
42	01-3009	Nut
43	01-2793	Screw
44	32-3021	Panel
45	42-0272-1-001	Main Circuit Board
46	42-0938	Retainer

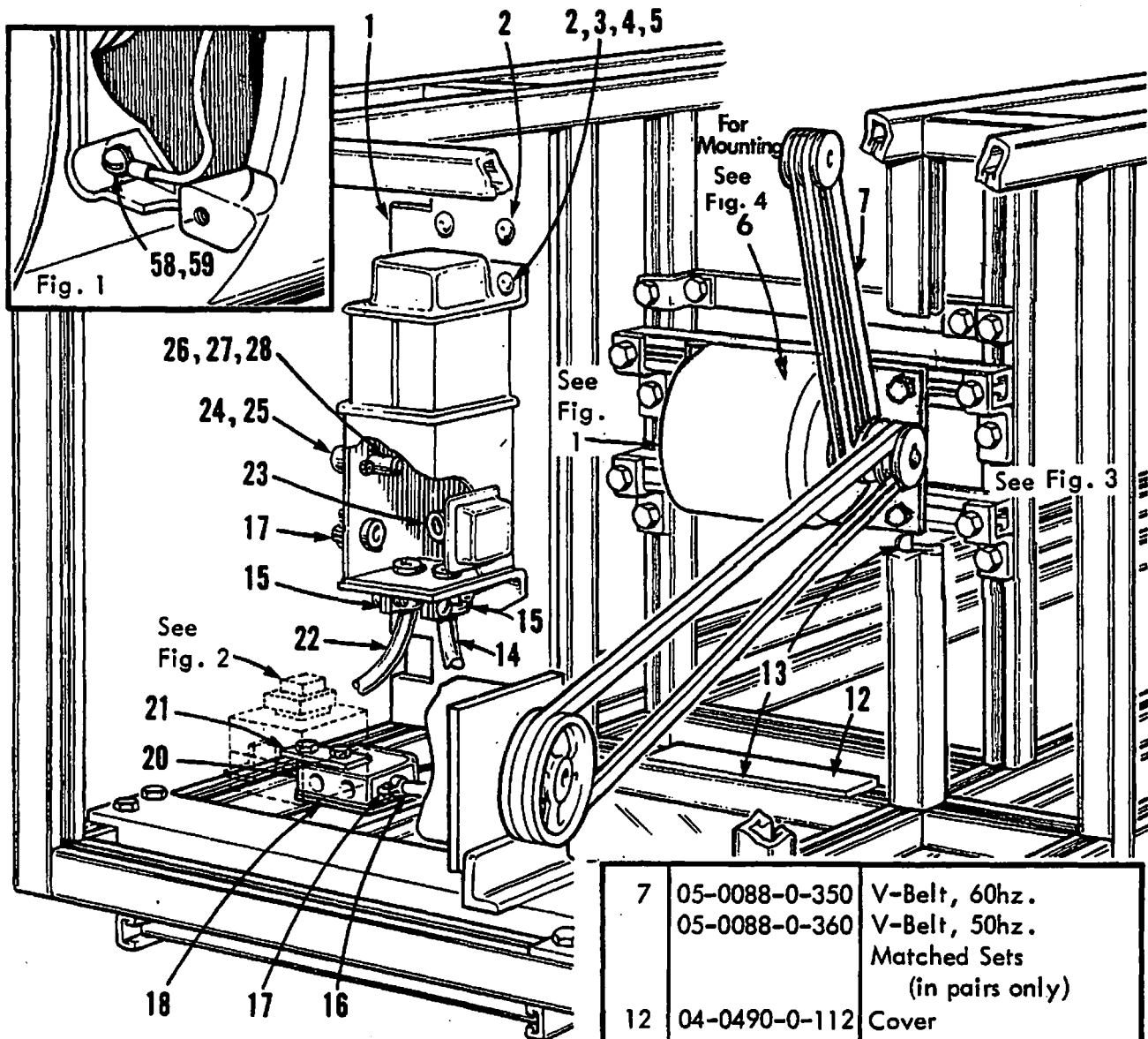


47	04-0273	Holder
48	42-0904	Bracket
49	01-2430	Screw
50	01-4004	Lockwasher
51	01-3415	Nut
52	06-5001-0-001	Capacitor, 22,000 uf
53	04-0271-0-001	115V, 24V & 3V Trans.
54	01-2450	Screw
55	01-4412	Washer
56	01-4407	Lockwasher
57	01-3402	Nut
58	01-2412	Screw
59	01-2482	Screw
60	04-0327	Capacitor Mount
62	04-0236-0-201	Diode
63	30-0478-0-625	Sleeving, 5/8"
64	04-1912	AC Contactor
65	42-0706-1-050	Capacitor, 3 uf
66	04-1223-0-004	Clamp
67	01-2579	Screw
68	04-1322	Barrier Terminal Block
69	42-0262-0-181	Jumper, white
70	42-0262-0-180	Jumper, red
71	06-0682	Terminal Jumper
72	04-0474	Barrier Terminal Block



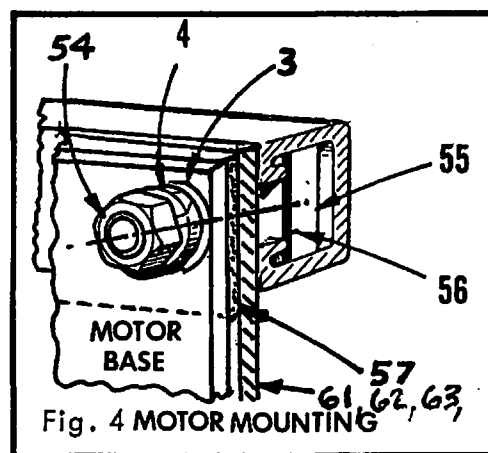
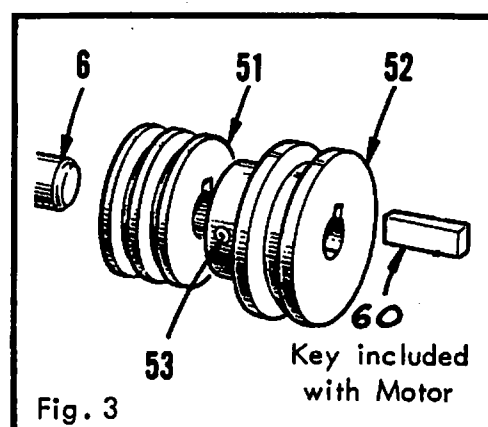
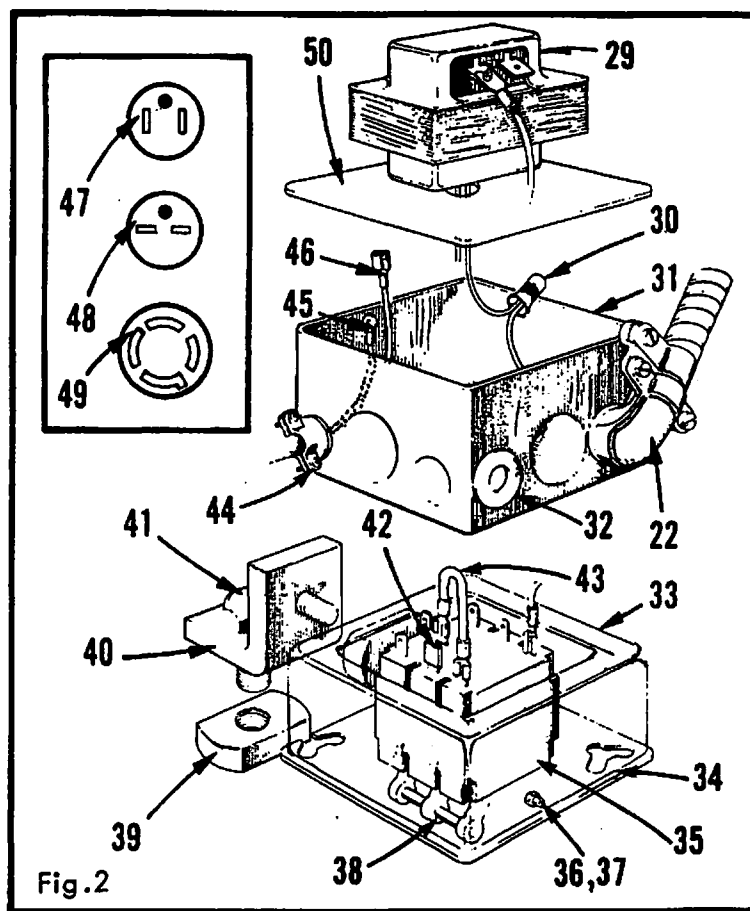
73	42-0262-0-171	Test Jack
74	04-0475	Marker Strip
75	42-0262-0-158	Jumper, white, 4"
76	04-0237-0-509	Resistor, 5 ohms, 5 W.
77	04-0391	Angle
78	32-3022	Shelf
79	04-1058	Offset Plunger
80	01-4581	Lockwasher, cadmium
81	32-0561-0-050	Prox.Thd.Pickup Board
82	32-0307-0-001	Timing Board
83	06-0590	Relay
84	06-0018	Socket, Relay
85	06-0550	Relay, Solid State





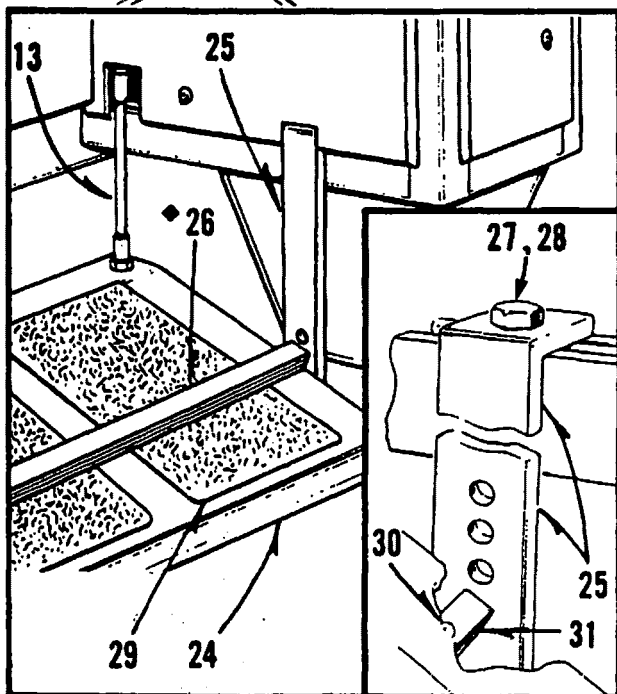
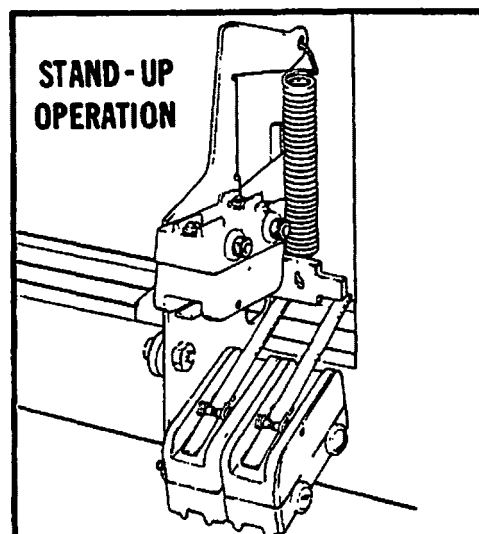
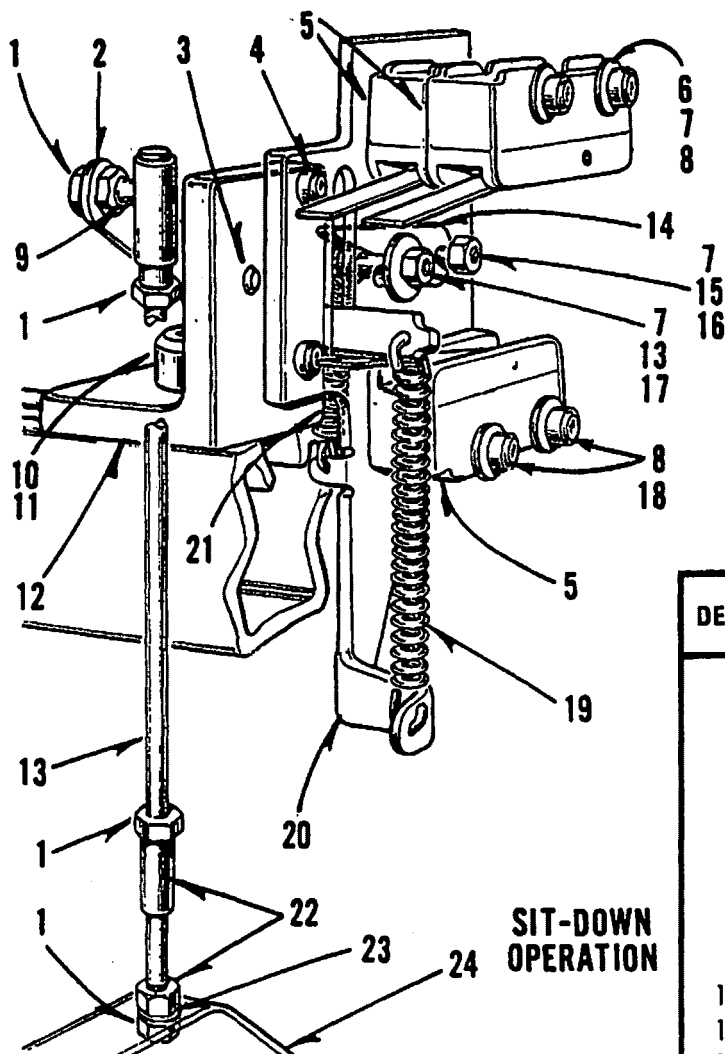
DET.	PART NUMBER	DESCRIPTION
1	32-3012	Mounting Panel
2	01-2793	Screw
3	01-4400	Washer
4	01-4422	Lockwasher
5	01-3406	Nut
MOTORS		
6	04-0002-0-016	115-230v. 1ph./60hz.
	04-0002-0-017	208v. 3ph./60hz.
		190v. 3ph./50hz.
	04-0002-0-047	208-460v. 3ph./50hz./60hz.
	04-0002-0-023	115-230v. 1ph./50hz.

7	05-0088-0-350	V-Belt, 60hz.
	05-0088-0-360	V-Belt, 50hz.
		Matched Sets (in pairs only)
12	04-0490-0-112	Cover
13	04-0491	Fiber Retainer
14	40-0262-0-118	Motor Harness
15	04-0014	Connector
16	42-0262-0-151	Light Receptacle Harness
17	04-0143	Connector
18	04-1534	Cover with Receptacle
	04-0145	Cover and 2 Receptacles
20	04-0127	Junction Box
21	04-0405	Bracket
22	42-0262-1-162	Circuit Breaker Harness
23	04-1083-0-001	Chase Nipple
24	30-0763	Fuse Holder
25	05-0058	Fuse, 8 amp.
26	01-2369	Screw



27	01-3421	Nut
28	30-0364	Transformer
29	30-0138	Transformer
30	05-0369	Connector
31	04-1120	Junction Box
32	04-1083-0-001	Snap Bushing
33	04-1002	Junction Box
34	04-1056	Cover
35	01-2411	Screw
36	01-2803	Screw
37	01-3420	Nut
38	04-1055	Switch
39	04-0467	Nut
40	04-0388	Fitting
41	04-0396	Screw
42	04-1004	Adaptor (single phase)
43	42-0262-1-152	Jumper (does not require adaptor 04-1004)
44	04-0143	Connector
45	30-0278	Terminal

46	04-0258-0-251	Terminal
47	04-0136	Cord and Plug 1ph. 105/125v.
48	04-0137	Cord and Plug 1ph. 125/250v.
49	06-0173	Cord, 3ph. 208/460v.
	04-0139-0-001	Cord, 3ph. 230v. (use on Canadian mchs. only)
50	04-1173	Cover
51	42-0352-0-001	Pulley, 60 hz.
	42-0352-0-625	Pulley, 50 hz.
52	42-0352-0-002	Pulley, 60 hz.
	42-0352-0-626	Pulley, 50 hz.
53	01-2456	Set Screw
54	01-3406	Nut
55	04-0442	Nut Plate
56	42-0935	Rubber Strip
57	42-0934	Rubber Strip
58	01-2802	Screw
59	01-4571	Lockwasher
60	01-8410	Key
61	04-1705	Plate
62	01-4522	Washer
63	01-2836	Screw

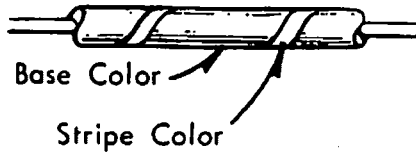


DET.	PART NUMBER	DESCRIPTION
1	01-3404	Nut
2	42-0850	Actuator Arm
3	01-1467	Screw
4	01-2764	Screw
5	40-0533	Switch
6	01-2519	Screw
7	01-3401	Nut
8	01-4411	Washer
9	20-6261	Ball Joint Asm.
10	01-2455	Screw
11	04-0467	Nut Block
12	04-0468	Bracket
13	42-0857	Rod
14	42-0853	Stop Lever
15	01-4550	Washer
16	01-7487	Bushing
17	01-2413	Screw
18	01-2433	Screw
19	01-5498	Spring
20	42-0852	Mounting Plate
21	01-5499	Spring
22	20-6263	Ball Joint Asm.
23	01-4003	Lock Washer
24	42-0855	Pedal
25	32-3037	Fitting
26	42-0854-0-001	Footrest
27	04-0396	Screw
28	04-0467	Nut
29	42-0925	Safety Pad
30	01-2451	Screw
31	42-0854	Shaft

◆ Optional on Sitting Model only.

## WIRE COLOR CODE

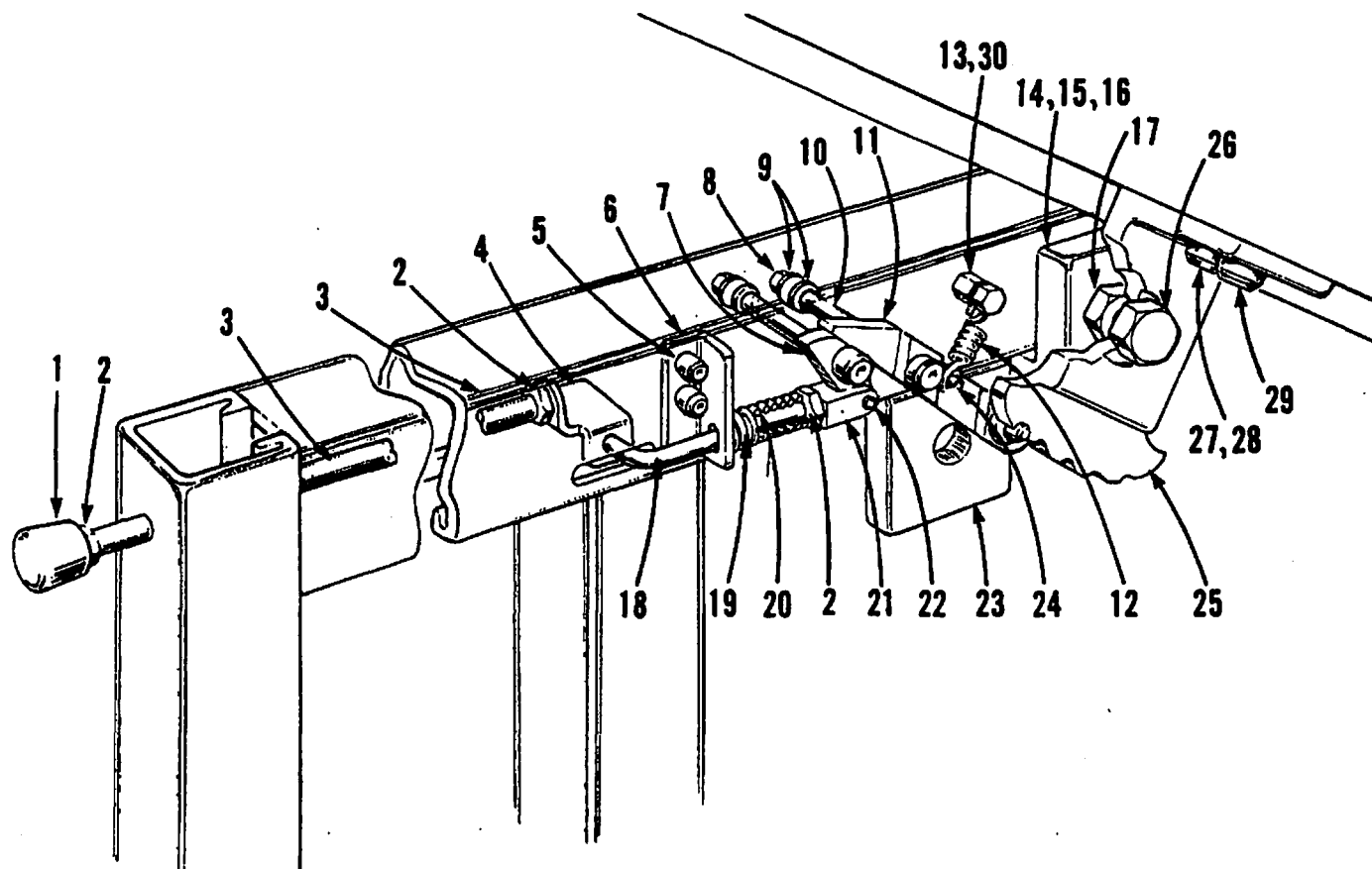
1st Color = Base Color  
2nd Color = Stripe Color



Electrical wire is furnished in lengths that are multiples of one foot.

PART NUMBER	DESCRIPTION
30-0262-0-001	#14 Wire, purple
30-0262-0-002	#14 Wire, gray
30-0262-0-003	#14 Wire, pink
30-0262-0-004	#14 Wire, black
30-0262-0-005	#14 Wire, blue
30-0262-0-006	#14 Wire, brown
30-0262-0-007	#14 Wire, green
30-0262-0-008	#14 Wire, orange
30-0262-0-009	#14 Wire, red
30-0262-0-010	#14 Wire, white
30-0262-0-011	#14 Wire, yellow
30-0262-0-012	#16 Wire, red
30-0262-0-013	#16 Wire, yellow
30-0262-0-014	#16 Wire, green
30-0262-0-015	#16 Wire, black
30-0262-0-016	#16 Wire, white
30-0262-0-017	#18 Wire, blue
30-0262-0-018	#18 Wire, purple
30-0262-0-019	#18 Wire, black
30-0262-0-020	#18 Wire, white
30-0262-0-021	#18 Wire, orange
30-0262-0-022	#18 Wire, green
30-0262-0-023	#18 Wire, red
30-0262-0-024	#18 Wire, brown
30-0262-0-025	#18 Wire, pink

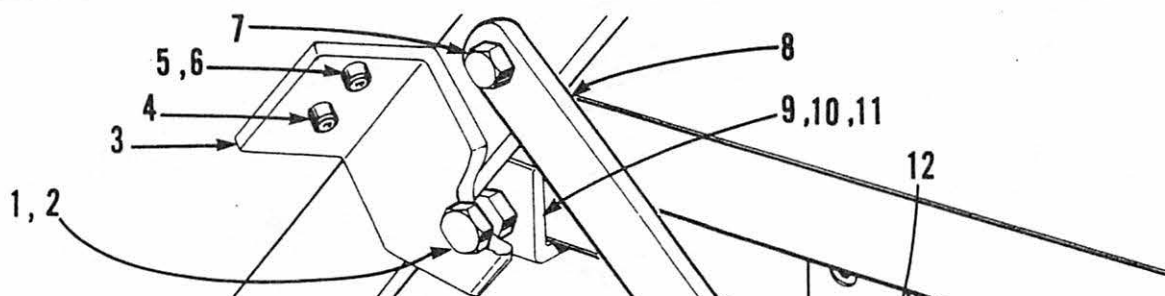
30-0262-0-026	#18 Wire, gray
30-0262-0-027	#18 Wire, yellow
30-0262-0-032	#16 Wire, orange
30-0262-0-033	#16 Wire, blue
30-0262-0-034	#16 Wire, pink
30-0262-0-035	#16 Wire, brown
30-0262-0-036	#16 Wire, gray
30-0262-0-037	#16 Wire, red/yellow
30-0262-0-038	#16 Wire, black/yellow
30-0262-0-039	#16 Wire, white/yellow
30-0262-0-040	#22 Wire, green
30-0262-0-041	#18 Wire, white/green
30-0262-0-042	#18 Wire, white/red
30-0262-0-043	#18 Wire, white/blue
30-0262-0-044	#18 Wire, white/black
30-0262-0-045	#18 Wire, yellow/green
30-0262-0-046	#18 Wire, yellow/red
30-0262-0-047	#18 Wire, yellow/blue
30-0262-0-048	#18 Wire, yellow/black
30-0262-0-049	#18 Wire, white/brown
30-0262-0-050	#18 Wire, yellow/brown
30-0262-0-051	#18 Wire, brown/white
30-0262-0-052	#18 Wire, red/white
30-0262-0-053	#18 Wire, blue/white
30-0262-0-054	#18 Wire, black/white
30-0262-0-055	#18 Wire, brown/yellow
30-0262-0-056	#18 Wire, red/yellow
30-0262-0-057	#18 Wire, blue/yellow
30-0262-0-058	#18 Wire, black/yellow



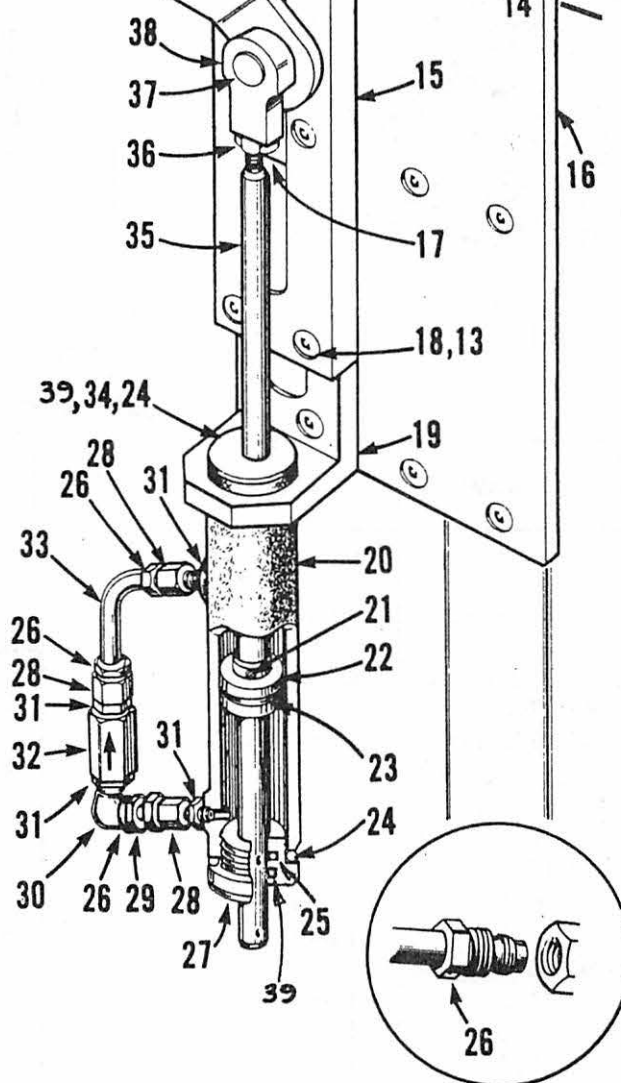
DET.	PART NUMBER	DESCRIPTION
1	42-0951	Knob
2	01-3404	Nut
3	42-0858	Rod
4	42-0860	Connector
5	01-2411	Screw
6	42-0862	Bracket
7	42-0866	Lever
8	01-3415	Nut
9	01-4063	Washer
10	01-1470	Screw
11	42-0867	Latch
12	01-5507	Spring
13	01-1472	Screw
14	04-0443-1	Fitting
15	04-0396	Screw
16	04-0467	Nut
17	01-3462	Nut
18	42-0868	Rod

19	01-5508	Spring
20	42-0864	Spacer
21	42-0865	Clevis
22	01-6652	Rollpin
23	04-0391	Fitting
24	01-6655	Spring Anchor
25	42-0328-0-002	Hinge, left
26	01-1471	Pivot
27	01-2483	Screw
28	01-4422	Lock Washer
29	01-2460	Screw
30	01-4412	Washer



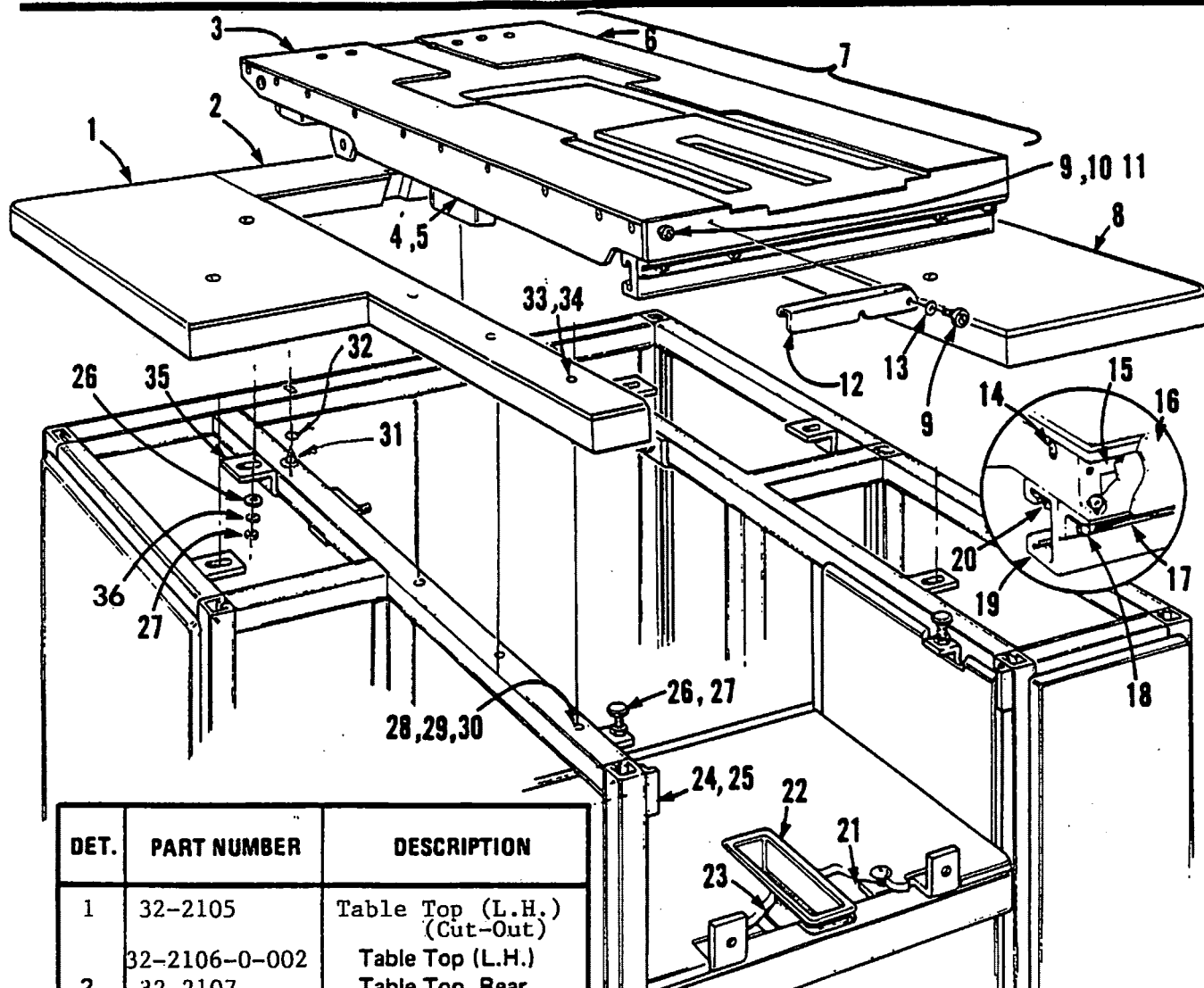


DET.	PART NUMBER	DESCRIPTION
1	01-1471	Pivot
2	01-3462	Nut
3	42-0328-0-001	Hinge (R.H.)
4	01-2460	Screw
5	01-2483	Screw
6	01-4422	Lockwasher
7	01-1492-1	Screw
8	42-1033	Lever
9	04-0443-1	Fitting
10	04-0396	Screw
11	04-0467	Nut
12	01-2713-0-001	Screw
13	42-1470	Plate
14	01-2451	Screw
15	42-1032	Slide
16	42-1031-1	Slide Bracket
17	42-1030	Nut Plate
18	01-2713-0-002	Screw
19	42-0885-1	Bracket
20	42-0875	Cylinder
21	01-6470	Rollpin
22	31-0472	Piston
23	01-4451	"O" Ring
24	30-0194	Gasket
25	01-4480	"O" Ring
26	40-0575-2**	Nut, replacement
27	42-1058	Cap Asm.
28	40-0310-1**	Connector
29	42-0894	Tube
30	40-0218-1**	Connector
31	01-3424	Nut
32	04-2094	Needle Valve
33	42-0895-1*	Tube
34	42-1060	Cap Asm.
35	42-0890	Piston Rod
36	01-3470	Nut
37	42-1212	Pivot Screw
38	42-0889-1	Rod End
39	01-4301	'U Cup' Seal



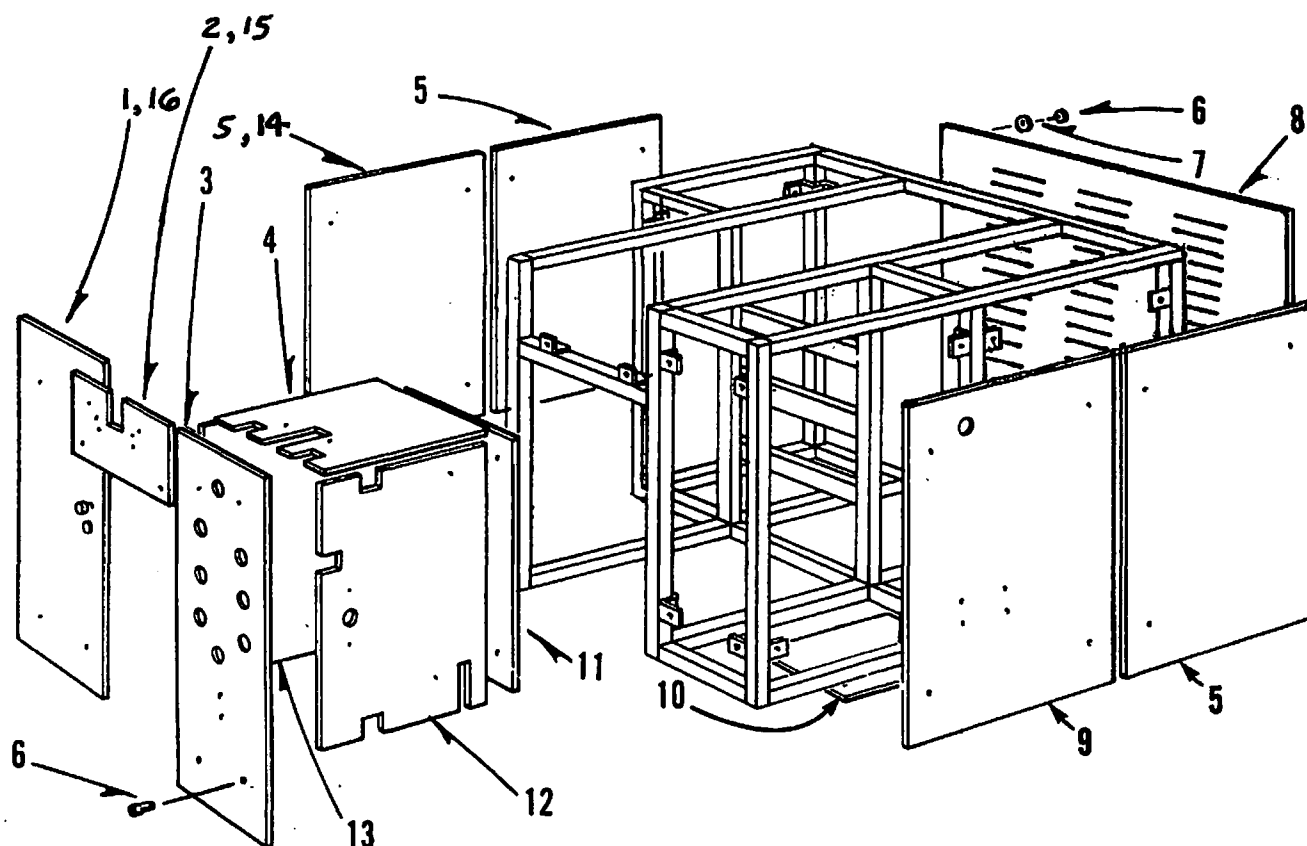
\*\*When replacing Tubes (25 and 28), Nut (24) must also be replaced. Nut (24) is included with Connectors (23 and 27). Nut (24) may also be ordered separately.

## BEDPLATE &amp; TABLE TOP



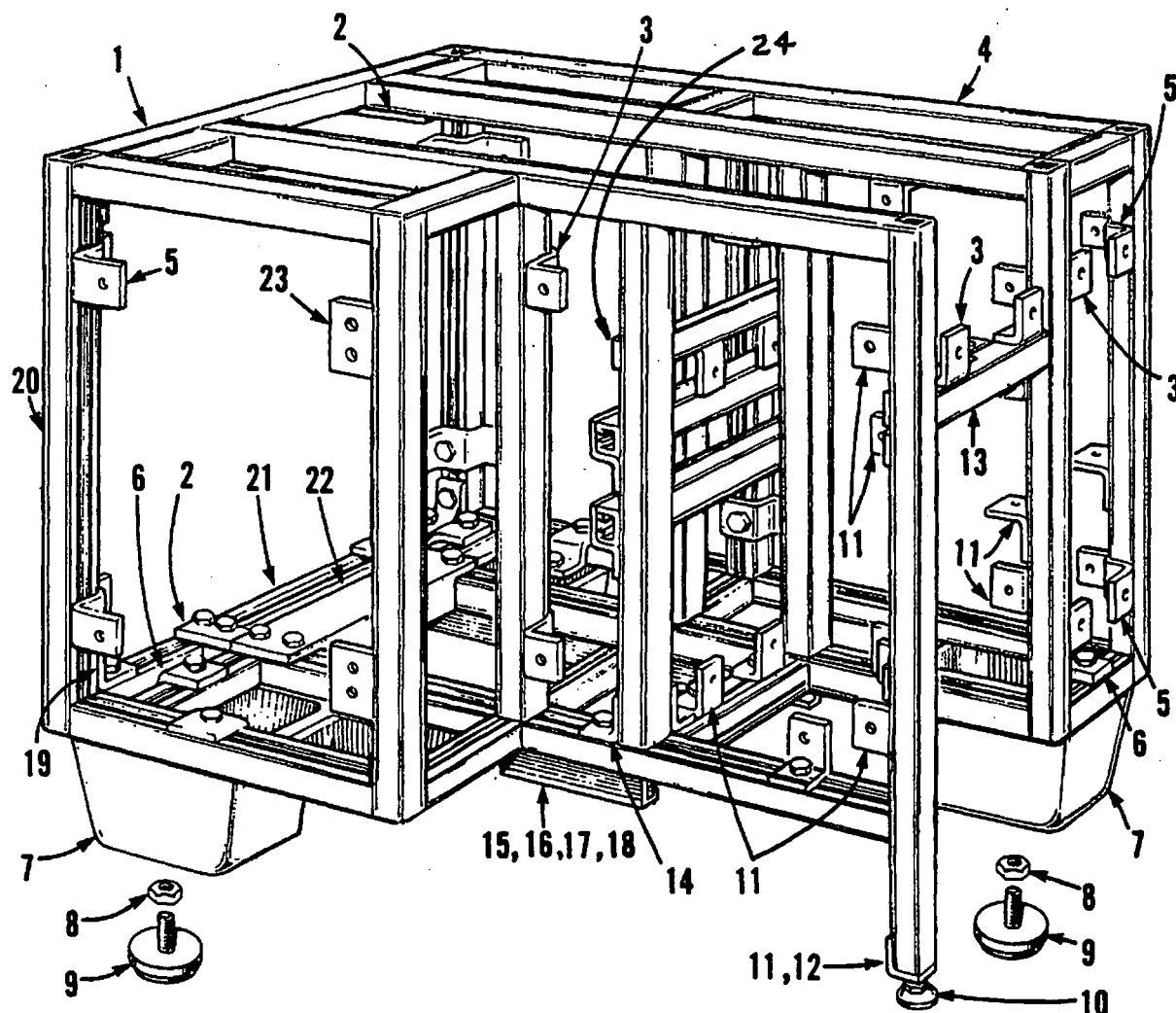
DET.	PART NUMBER	DESCRIPTION
1	32-2105	Table Top (L.H.) (Cut-Out)
	32-2106-0-002	Table Top (L.H.)
2	32-2107	Table Top, Rear
3	32-2102-0-001	Cover (L.H.)
4	42-0703	Side Bar (L.H.)
5	42-0703-2-001	Side Bar (R.H.)
6	32-2102-0-002	Cover (R.H.)
7	32-2100-0-050	Bedplate Asm.
8	32-2106-0-001	Table Top (R.H.)
9	01-1476	Screw
10	01-4012	Washer
11	01-7492	Bushing
12	42-0813	Support
13	01-4452	Washer
14	01-2570	Screw
15	42-0873	Front Plate
16	42-0872	Front Plate Cover
17	42-1038	Support
18	01-2555	Screw
19	42-0874	Cross Bar

20	01-2506	Screw
21	04-0391	"L" Fitting
22	42-0554	Pan
23	40-0640	Foam Pad
24	04-0451-1	"Z" Fitting
25	01-2411	Screw
26	43-2229	Button
27	01-3406	Nut
28	01-2659	Screw
29	01-3468	Nut
30	42-0947	Nut Block
31	01-2536	Screw
32	01-4559	Washer
33	04-0055	Combination Nut
34	04-1062	Stud 1 1/4"
35	04-0464	"Z" Fitting
36	01-4422	Lockwasher



DET.	PART NUMBER	DESCRIPTION
1	32-3019	Door Panel(Cut Out)
2	32-3016	Panel
3	32-3015	Control Panel
4	32-3013	Panel
5	32-3018	Panel
6	01-2793	Screw
7	01-4439	Washer
8	32-3017	Back Cover
9	32-3027	Panel
10	32-3026	Panel
11	32-3011	Panel
12	32-3025	Panel
13	32-3024	Panel
14	32-3020	Side Panel (CutOut)

15	32-3010	Silk Screen Plate
16	32-3009	Door (Full Frame)

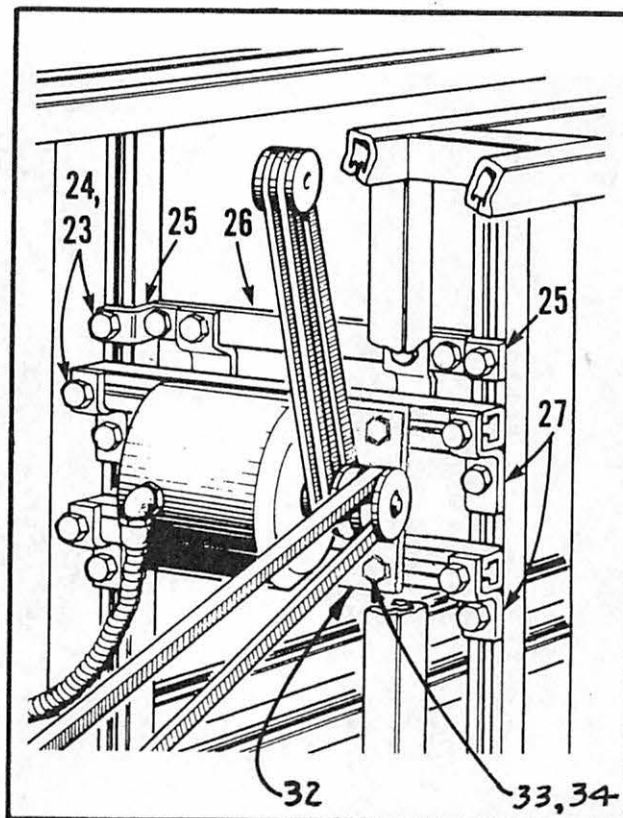
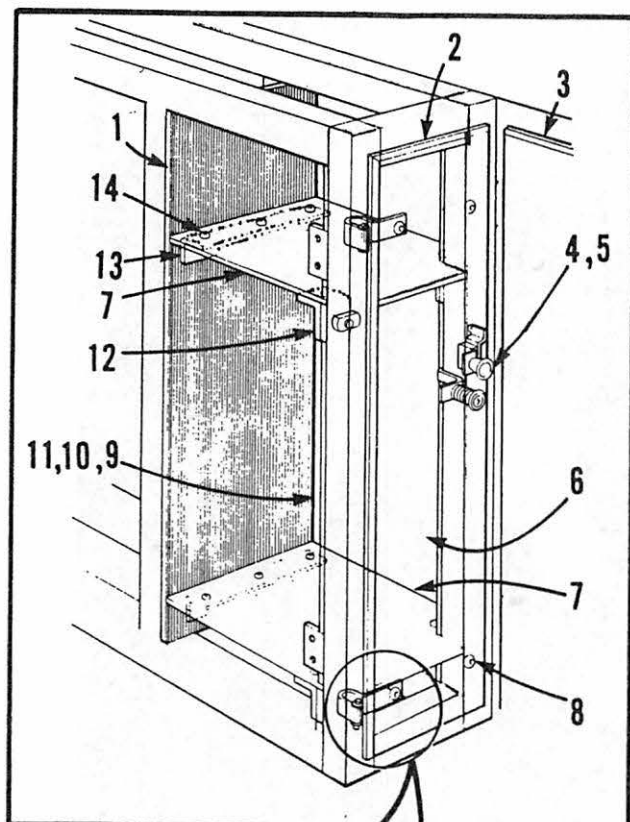


DET.	PART NUMBER	DESCRIPTION
1	04-0400	Channel, rear top
2	04-0405	Plate
3	04-0409*	"Z" Fitting
4	04-0404-0-050	Frame (R.H.)
5	04-0387*	"W" Fitting
6	04-0408*	"Z" Fitting
7	32-3031	Foot
8	01-3008	Washer
9	04-0393	Foot Pad
10	04-0493	Guide Foot
11	04-0391*	"L" Fitting
12	01-3406	Nut
13	04-0401	Channel, front
14	04-0386*	"W" Fitting

15	04-0392	Oil Pan Support
16	01-2768	Screw, front
17	01-2436	Screw, rear
18	01-3001	Nut
19	04-0388*	"L" Fitting
20	04-0390-0-050	Frame (L.H.)
21	04-0402	Channel, rear bottom
22	42-0349-1	Pump Channel
23	04-1069	Bracket
24	32-3014	Channel

\*All fitting & similar structural parts use 04-0396 Screw & 04-0467 Nut.

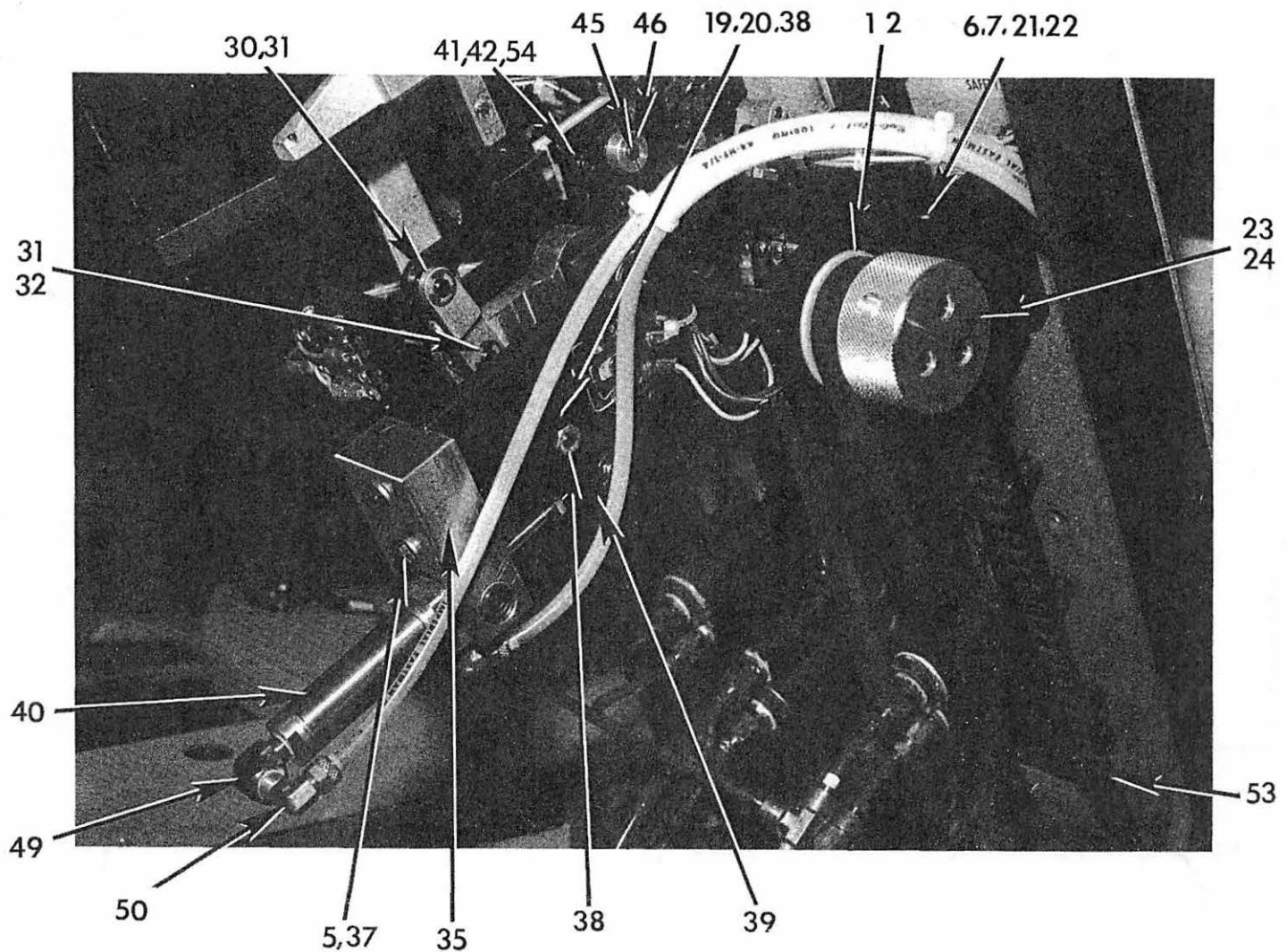




DET.	PART NUMBER	DESCRIPTION
1	32-3029	Back Panel (Cut Out)
2	32-3019	Door Panel (Cut Out)
3	32-3020	Side Panel (Cut Out)
4	04-1086-0-001	Magnetic Latch
5	01-2582	Screw
6	32-3023	Side Panel (Cut Out)
7	32-3028	Shelf (Cut Out)
8	01-2801	Screw
9	04-0490-0-022	Closure (1-3/8")

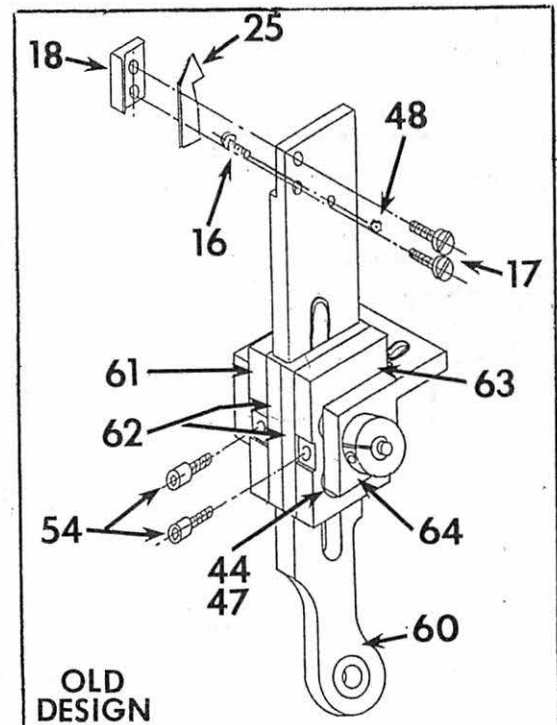
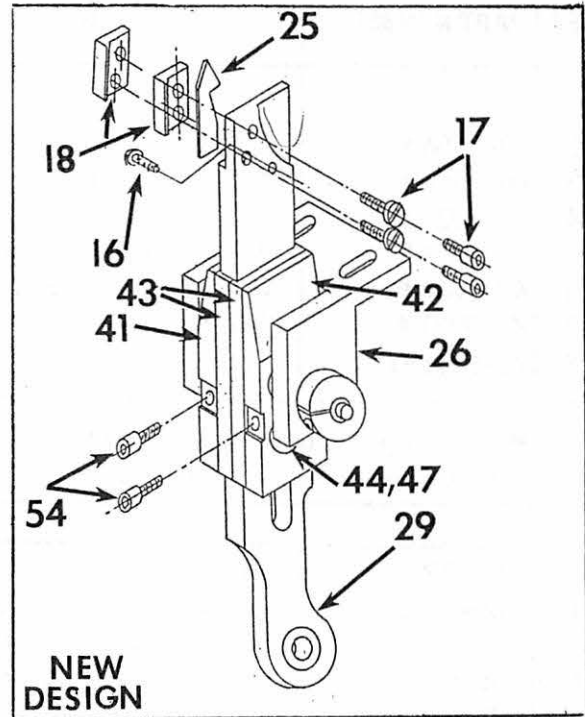
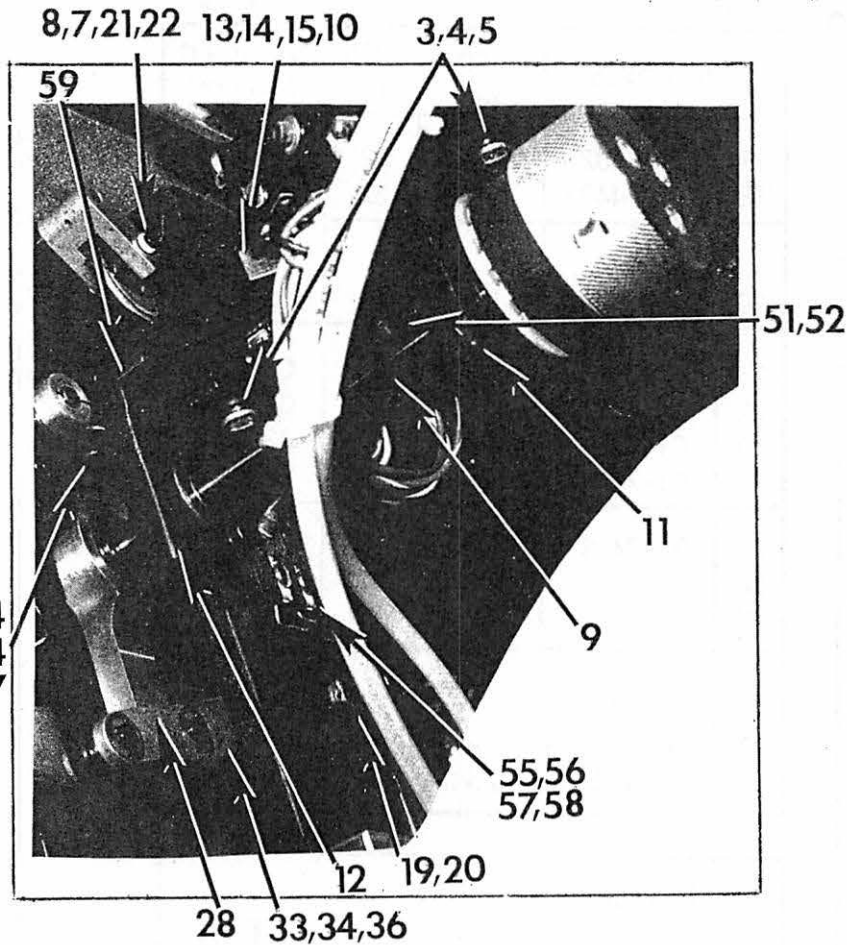
10	04-0490-0-176	Closure (11")
11	04-0490-0-007	Closure (7/16")
12	04-0391	"L" Fitting
13	04-1091	Shelf Support
14	01-2654	Screw
15	01-2461	Screw
16	01-6678	Hinge Pin
17	01-6368	Retaining Ring
18	01-2793	Screw
19	01-4400	Washer
20	01-3406	Nut
21	04-1073	Hinge Hasp
22	04-1072	Hinge Mounting Plate
23	04-0396	Screw
24	04-0467	Nut Block
25	04-0407	"Z" Fitting
26	04-0406	Channel
27	04-0408	"Z" Fitting
28	04-0424	Channel
29	32-3009	Door (Full)
30	32-3043	Rear Comp. (Full)
31	32-3008	Shelf (Full)
32	04-1705	Plate
33	01-2797	Screw
34	04-0442	Nut Plate





Det.	Part Number	Description	Det.	Part Number	Description
01	32-2009	Pulley	25	32-2019-1	Knife Blade
02	01-8416-0-002	Key	26	32-2197-0-050	Pivot Block Asm.
03	01-1601-0-303	Screw	27	01-4404	Washer
04	01-4445	Washer	28	32-2022-0-050	Crank Asm.
05	01-4004	Lockwasher	29	32-2207-0-050	Knife Holder (3/8")
06	32-2010	Mounting Block		32-2193-0-050	Knife Holder (1/2"-7/8")
07	32-2011	Spacer	30	01-6928-0-002	Pin
08	32-2012	Mounting Block	31	01-6475	Retaining Ring
09	32-2013-0-050	Shaft Asm.	32	01-6928-0-001	Pin
10	01-7313-0-001	Bearing	33	01-4591	Washer
11	32-2015	Bearing Block	34	01-6502	Retaining Ring
12	32-2016	Bearing Block	35	32-2027-0-050	Pivot Block Asm.
13	01-1958-0-001	Screw	36	44-0966-2	Lever Asm.
14	01-4003	Lockwasher	37	01-1601-0-304	Screw
15	32-2017	Yoke Support Bar	38	32-2030-0-050	Pivot Link Asm.
16	01-2318	Screw - #2	39	32-2034	Rod Clevis Asm.
17	01-2431	Screw (for 3/8" style)	40	07-0604	Air Cylinder
	01-1733-0-301	Screw (for 1/2"-7/8" style)	41	32-2196	Knife Guide Left
18	32-2208	Clamp Knife (3/8")	42	32-2195	Knife Guide Right
	32-2018	Clamp Knife (1/2"-7/8")	43	32-2194	Knife Guide Bearing
19	01-3472	Nut	44	01-2783	Screw
20	01-1952	Shoulder Screw	45	01-6950-0-004	Pin
21	01-4304-0-001	Lockwasher	46	01-7314-0-001	Clamp Collar
22	01-2243	Screw	47	01-3414	Nut
23	32-2037	Handwheel	48	01-3451	Nut
24	01-2437	Screw	49	07-0003-0-001	Elbow-Street





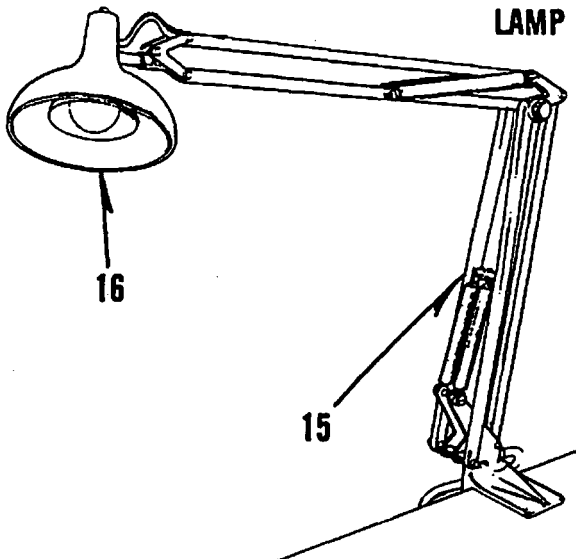
Det.	Part Number	Description
50	07-0093-0-001	Elbow
51	32-2174	Retainer
52	01-2582	Screw
53	05-1182-0-001	Timing Belt
54	01-2693	Set Screw
55	04-0606	Terminal Block
56	04-0236-0-201	Diode
57	01-2530	Screw
58	01-4406	Lockwasher
59	32-2186	Lint Cover
60	32-2025-0-050	Knife Holder (old style)
61	32-2035	Block Knife Guide (old style)
62	32-2036	Bearing (old style)
63	32-2038	Block Knife Guide (old style)
64	32-2020-0-050	Pivot Block Asm. (old style)

**OPTION - Hydraulic Center Knife Asm. 32-2199-0-050**

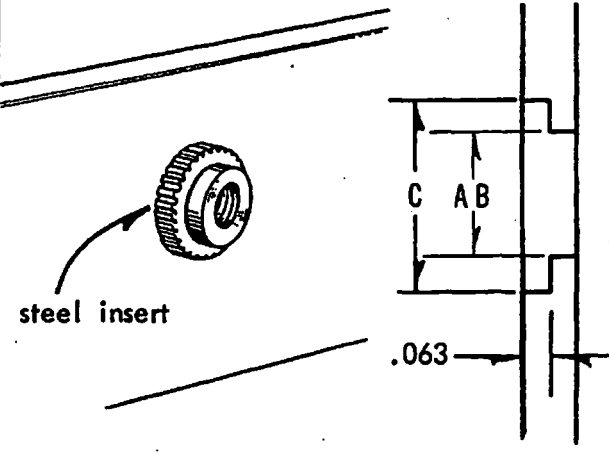
04-0815	Bolt	32-2190	Valve Block
07-0688	Hydraulic Cylinder	32-2191	Pivot
32-1033	Threaded Rod	32-2192	Cylinder Mount
32-2189	Pivot Block	32-2198-0-050	Retracting Cylinder Asm.
32-2189-0-050	Pivot Block Asm.	01-1148	Screw

DET.	PART NUMBER	DESCRIPTION
1		
2	40-0586 ●	1/4" Spirap
3	40-0594 ●	5/8" Conduit
4	32-1036 ●	3/8" Sponge Rubber
5	07-0294 ●	1/4" Plastic Tubing
6	40-0826 ●	3/8" Plastic Tubing
7	42-0931 ●	Vinyl Tape
8	40-0762-1 ●	Pad, self-adhesive
● Materials are furnished in lengths that are multiples of one foot.		

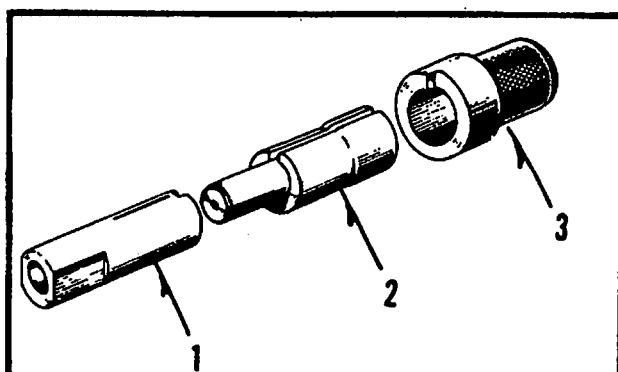
9	03-0022*	Oiler
10	05-0090*	Lubricating Oil, 8 oz. (Texaco Cepheus "D")
11	05-0091	Rubber Cement, 5 oz.
12	05-0140*	Clutch Grease 4-1/2 oz
13	05-0192	"Loctite" Cement
14	05-0357-1	Hydraulic Fluid

		
15	05-0092-1	Luxo-Flair Lamp, com.
16	05-0106	Socket and switch, replacement part

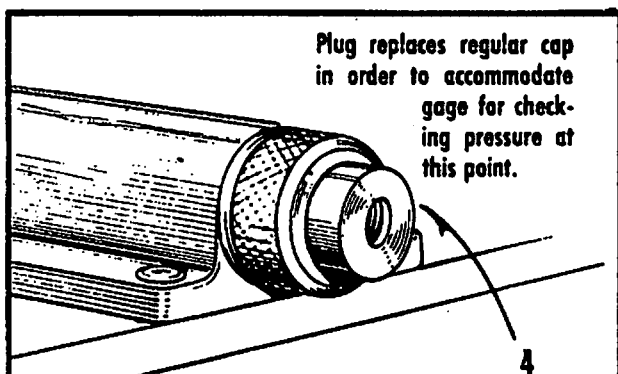
HELI-COILS		Tap Size	Drill Size	Use Insert Mandrel
17	01-7432	4-40	32	03-0155
18	01-7443 ▲	4-40	32	03-0155
20	01-7441	8-32	18	03-0157
21	01-7417	10-24	8	03-0158
22	01-7419	10-24	8	03-0158
23	01-7430	10-24	8	03-0158
24	01-7446	10-24	8	03-0158
25	01-7418	1/4"-20	G	03-0159
26	01-7420	1/4"-20	G	03-0159
27	01-7431	1/4"-20	G	03-0159
28	03-0164	Inserting and Extracting Tool		
▲ Screw locking Heli-Coil				

STEEL INSERTS					
					
		Tap Size	A Drill Size	B Pilot	C Counter Bore
29	01-7452	10-24	1/4"	1/4"	3/8"
30	01-7461	8-32	1/4"	1/4"	3/8"
31	01-7460	6-32	#7	.200	21/64"
32	01-7459	4-40	#7	.200	21/64"

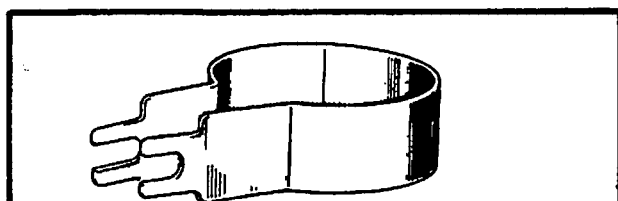
\*Only those items marked with an asterisk (\*) are supplied initially with each machine. To order a complete set of tools marked with an asterisk (\*), specify 03-0173.



1	03-0091-1	Sleeve
2	03-0092	Guide Stud
3	03-0090	Collar



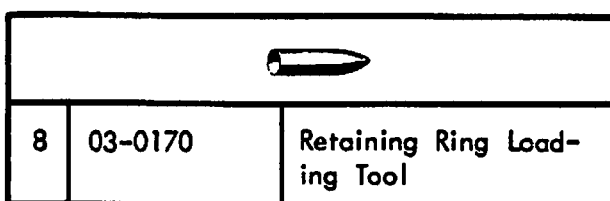
4	03-0195	Pressure Gauge Adaptor
5	03-0259	Pressure Gauge



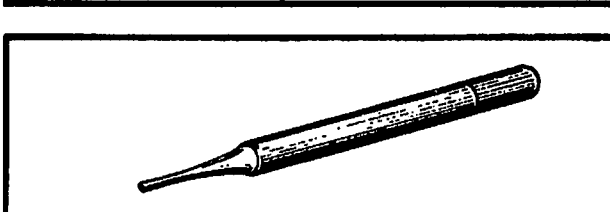
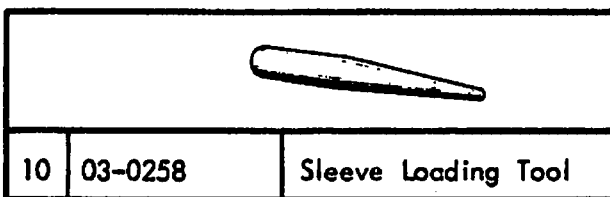
6	03-0193	Spring Clip for holding Slide Blocks in position
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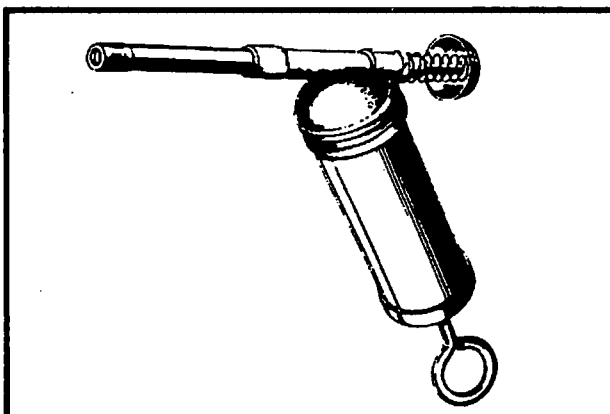
7	03-0169	"O" Ring Loading Tool
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8	03-0170	Retaining Ring Loading Tool
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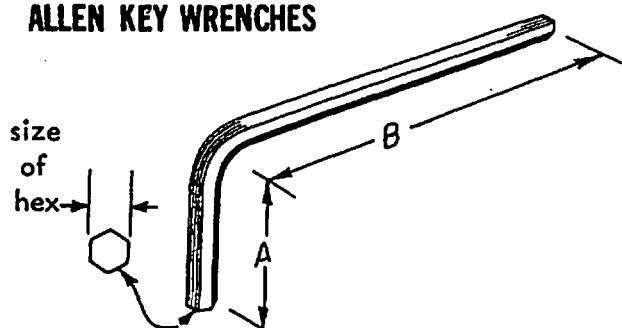
11	03-0079	1/8" Rollpin Punch
12	03-0081	3/16" Rollpin Punch



13	03-0085*	Grease Gun
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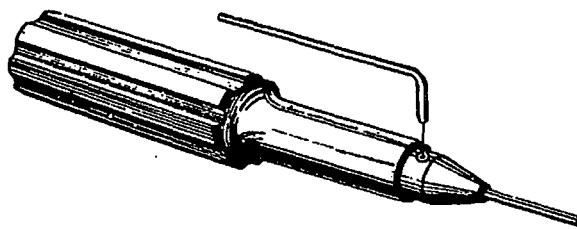
\*Only those items marked with an asterisk (\*) are supplied initially with each machine. To order a complete set of tools marked with an asterisk (\*), specify 03-0173.

## ALLEN KEY WRENCHES



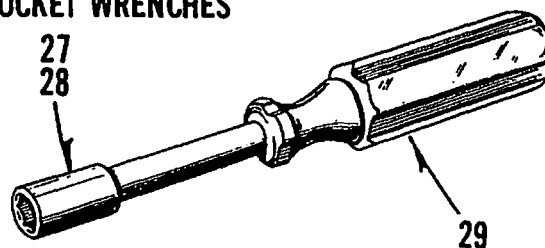
		SIZE OF HEX	A	B
1	03-0054*	3/32"	21/32"	2"
2	03-0055*	.050	9/16"	1-3/4"
3	03-0056*	1/16"	9/16"	1-3/4"
4	03-0057	5/64"	3/8"	1-7/8"
5	03-0059*	1/8"	1/2"	2-1/4"
6	03-0061*	5/32"	27/32"	2-1/2"
7	03-0063*	3/16"	15/16"	2-3/4"
8	03-0065	7/32"	1-1/32"	3"
9	03-0066	5/16"	1-1/4"	3-3/4"
10	03-0067	3/8"	1-3/8"	4-1/4"
11	03-0162	5/64"	5/8"	1-7/8"
12	03-0176	3/32"	3/8"	2"
13	03-0177	7/64"	45/64"	2-1/8"
14	03-0180	9/64"	51/64"	2-3/8"
15	03-0181	9/64"	1/2"	2-3/8"
16	03-0183	1/4"	1-1/8"	3-1/4"

## HANDI-SET ALLEN KEY WRENCHES



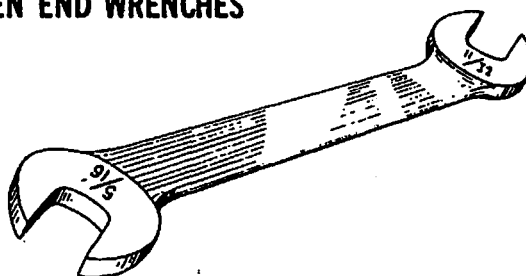
23	03-0105*	5/64" Wrench, complete
24	03-0161	3/32" Wrench, complete
25	03-0175*	.050" Wrench, complete
26	03-0179	7/64" Wrench, complete

## SOCKET WRENCHES



27	03-0097	3/8" Socket
28	03-0133	1/4" Socket
29	03-0096	Socket Drive Handle

## OPEN END WRENCHES

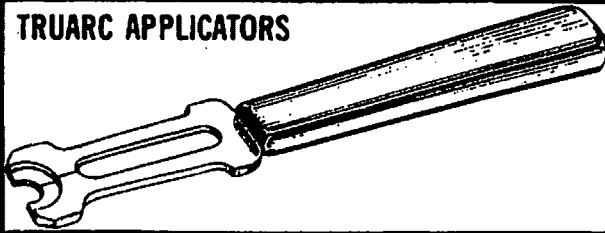


		Size of Openings
30	03-0019*	1/4" & 1/4" (boxed)
31	03-0068	5/16" & 11/32"
32	03-0072	9/16" & 5/8"
33	03-0086	11/16" & 3/4"
34	03-0106	5/16" & 3/8"
35	03-0107	7/16" & 1/2"

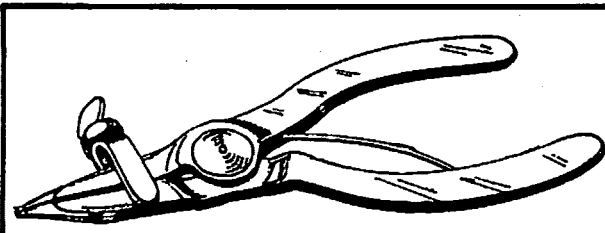
\*Only those items marked with an asterisk (\*) are supplied initially with each machine. To order a complete set of tools marked with an asterisk (\*), specify 03-0173.



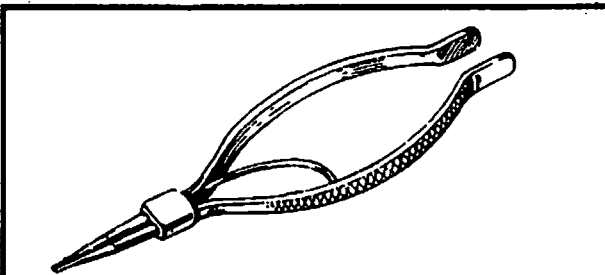
## TRUARC APPLICATORS



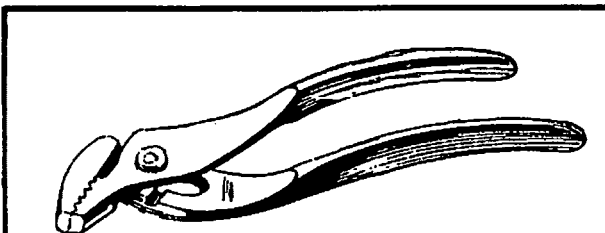
1	03-0139	Use for 5/16" Truarc
2	03-0140	Use for 1/4" Truarc
3	03-0141	Use for 3/16" Truarc
4	03-0142	Use for 5/32" Truarc
5	03-0143	Use for 1/8" Truarc
6	03-0144	Use for 3/32" Truarc
7	03-0163	Use for 3/16" Truarc (Heavy Duty)



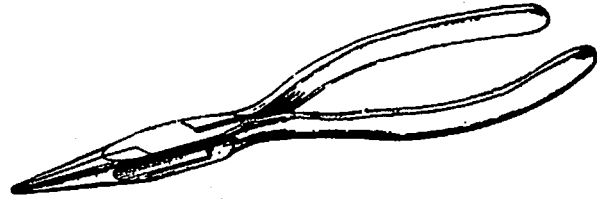
8	03-0074	Truarc Pliers
9	03-0263	Truarc Pliers (Offset)



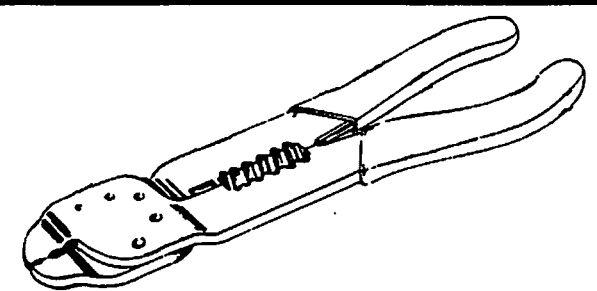
10	03-0071	Truarc Pliers
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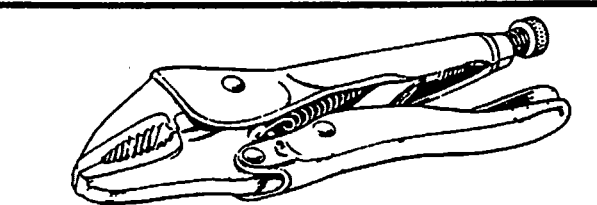
11	03-0123	Ignition Pliers
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12	03-0137	Long Nose Pliers
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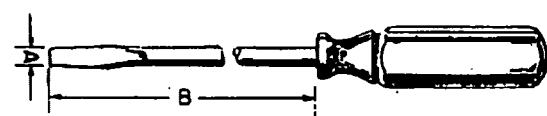


13	03-0148	Crimping & Stripping Pliers
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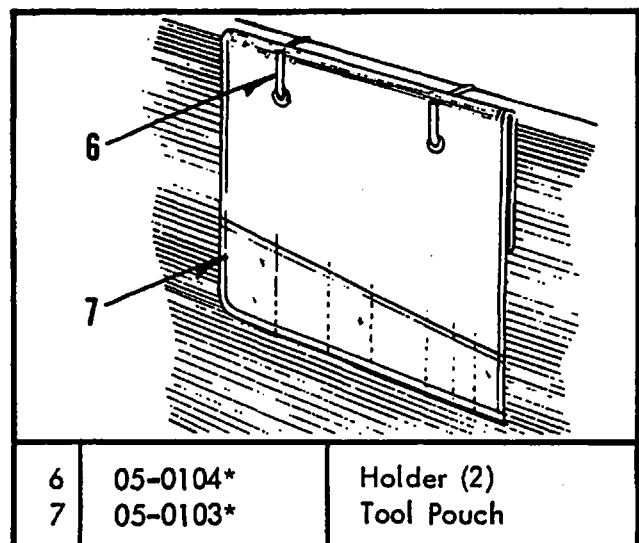
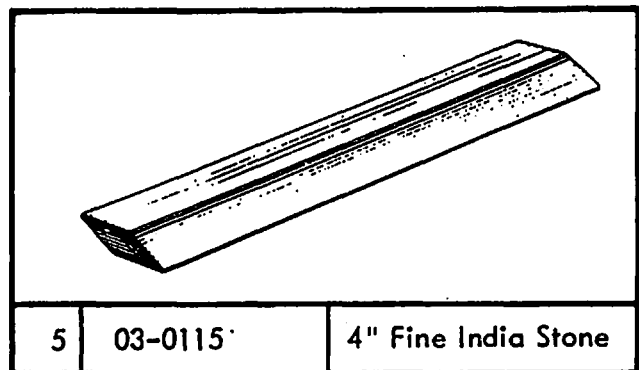
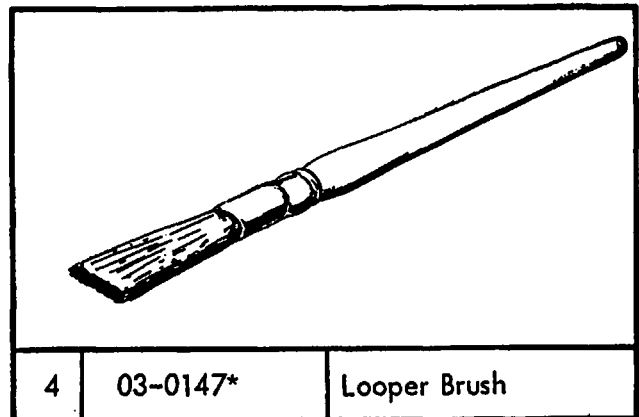
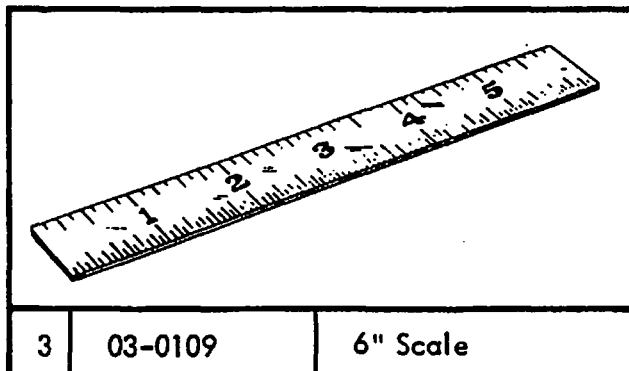
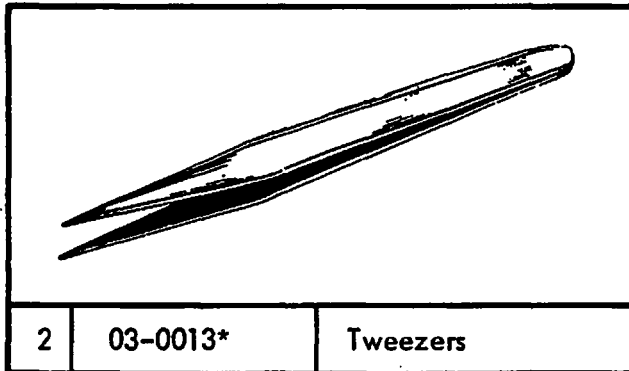
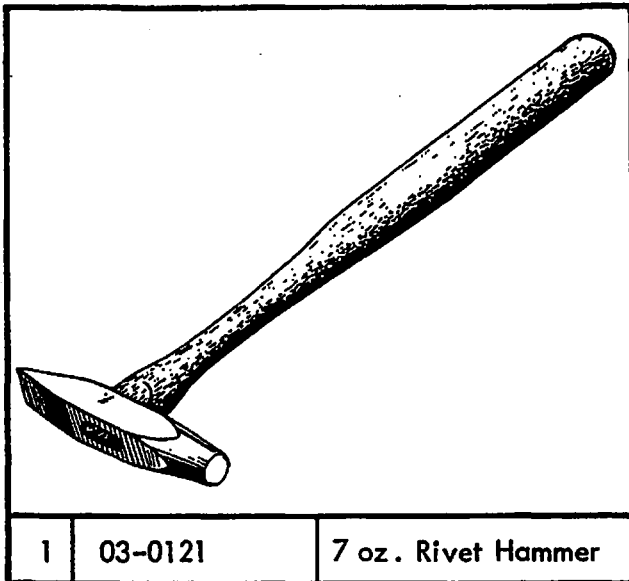
14	03-0149	Vise Grip Wrench
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## SCREWDRIVERS



		A	B
15	03-0076*	1/8"	3"
16	03-0190	3/16"	6"
17	03-0083	3/16"	10"
18	03-0187	5/16"	8"
19	03-0117	1/4"	2-1/4"
		(with Screw Holding Feature)	
20	03-0174	3/16"	6"
		(with Screw Holding Feature)	

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# NOTES

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01-1471	54	26
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01-3462	54	17
01-3462	55	02
01-3463	26	19
01-3465	39	26
01-3467	40	11
01-3468	56	29
01-3470	55	36
01-3472	60	19
01-4002	32	16
01-4003	06	08
01-4003	10	20
01-4003	12	09
01-4003	14	09
01-4003	24	13
01-4003	27	18
01-4003	28	14
01-4003	29	21

PART NUMBER	PAGE	DET.
01-4003	31	03
01-4003	39	06
01-4003	52	23
01-4003	60	14
01-4004	24	01
01-4004	49	50
01-4004	60	05
01-4005	16	32
01-4010	39	29
01-4011	24	10
01-4012	56	10
01-4018	29	14
01-4029	16	22
01-4044	04	11
01-4063	54	09
01-4072	35	26
01-4135	45	44
01-4136	45	43
01-4300	41	31
01-4301	13	15
01-4301	14	29
01-4301	31	34
01-4301	55	39
01-4302	25	15
01-4304-0-001	60	21
01-4400	44	16
01-4400	50	03
01-4400	59	19
01-4401	48	24
01-4402	01	13
01-4402	17	46
01-4402	23	10
01-4404	27	19
01-4404	36	02
01-4404	45	51
01-4404	60	27
01-4405	06	26
01-4405	28	22
01-4405	36	19
01-4405	48	25
01-4406	05	09
01-4406	06	23
01-4406	10	13
01-4406	12	05
01-4406	17	54
01-4406	18	09
01-4406	22	02
01-4406	25	26
01-4406	27	16
01-4406	29	03
01-4406	34	04
01-4406	43	04
01-4406	61	58
01-4407	17	45
01-4407	18	03
01-4407	28	07
01-4407	29	12
01-4407	36	42
01-4407	38	04
01-4407	40	29

PART NUMBER	PAGE	DET.
01-4407	49	56
01-4410	28	01
01-4411	06	17
01-4411	15	32
01-4411	17	61
01-4411	22	06
01-4411	22	16
01-4411	25	18
01-4411	27	08
01-4411	29	05
01-4411	31	31
01-4411	33	41
01-4411	40	23
01-4411	52	08
01-4412	18	08
01-4412	35	21
01-4412	49	55
01-4412	54	30
01-4420	18	29
01-4422	27	13
01-4422	36	10
01-4422	44	15
01-4422	50	04
01-4422	54	28
01-4422	55	06
01-4422	56	36
01-4424	16	33
01-4426	42	16
01-4428	42	13
01-4428	45	29
01-4438	14	07
01-4438	31	07
01-4439	14	28
01-4439	21	15
01-4439	57	07
01-4441	01	02
01-4442	12	16
01-4445	60	04
01-4446	04	04
01-4450	13	05
01-4450	36	24
01-4451	13	07
01-4451	14	06
01-4451	31	05
01-4451	55	23
01-4452	56	13
01-4459	29	17
01-4470	10	14
01-4473	29	26
01-4480	13	04
01-4480	14	03
01-4480	25	05
01-4480	31	15
01-4480	55	25
01-4482	42	08
01-4483	41	19
01-4484	01	15
01-4487	18	21
01-4489	02	11
01-4491	27	22

PART NUMBER	PAGE	DET.
01-4491	36	11
01-4493	36	14
01-4494	03	04
01-4500	38	26
01-4505	44	02
01-4507	15	19
01-4507	36	23
01-4508	45	28
01-4510	29	07
01-4522	51	62
01-4528	32	05
01-4528	35	14
01-4533	06	19
01-4534	06	20
01-4537	32	06
01-4550	52	15
01-4559	56	32
01-4560	25	31
01-4563-1	14	22
01-4567	40	12
01-4568	40	13
01-4569	38	25
01-4570	48	34
01-4571	35	27
01-4571	51	59
01-4572	22	11
01-4572	35	02
01-4572	37	50
01-4572	47	08
01-4573	14	22
01-4578	23	12
01-4578	41	06
01-4579-0-003	35	03
01-4581	49	80
01-4591	60	33
01-4596	14	22
01-4672-0-003	04	13
01-4673	35	24
01-4692	22	40
01-4729	35	23
<b>01-5000</b>		
01-5001	16	35
01-5409	28	18
01-5418	17	48
01-5419	06	05
01-5425	43	11
01-5436	34	02
01-5441	24	26
01-5453	29	15
01-5455	18	25
01-5458	27	23
01-5479	03	01
01-5480	03	02
01-5486	06	18
01-5490	10	07
01-5498	52	19
01-5499	52	21

PART NUMBER	PAGE	DET.
01-5507	54	12
01-5508	54	19
01-5515	22	27
01-6138-1	17	82
01-6368	01	23
01-6368	34	08
01-6368	35	32
01-6368	59	17
01-6407	21	23
01-6419	24	16
01-6420	36	33
01-6423	28	02
01-6430	16	40
01-6431	28	03
01-6432	28	09
01-6433	28	11
01-6434	28	10
01-6452	17	47
01-6453	17	42
01-6454	10	18
01-6454	21	24
01-6454	23	11
01-6456	27	11
01-6464	23	03
01-6470	14	04
01-6470	55	21
01-6474	06	14
01-6474	17	63
01-6475	21	29
01-6475	31	21
01-6475	60	31
01-6477	01	22
01-6480	18	30
01-6482	31	24
01-6483	06	13
01-6488	10	17
01-6489	01	30
01-6501	13	08
01-6502	60	34
01-6502-0-002	25	32
01-6503	31	22
01-6504	21	28
01-6519	03	15
01-6521	05	10
01-6538	34	12
01-6539	34	07
01-6543	21	13
01-6543	23	08
01-6547	43	07
01-6549	43	06
01-6550	43	10
01-6551	16	20
01-6551	18	12
01-6551	21	30
01-6551	23	19
01-6551	29	18
01-6551	43	09
01-6552	18	14
01-6555	14	19
01-6558	01	31

PART NUMBER	PAGE	DET.
01-6561	01	16
01-6561	26	14
01-6564	31	04
01-6565	34	16
01-6567	18	18
01-6569	18	37
01-6583	45	45
01-6584	45	48
01-6585	45	37
01-6589	29	19
01-6621	15	22
01-6628	15	16
01-6629	15	20
01-6633	10	08
01-6652	12	03
01-6652	13	14
01-6652	54	22
01-6655	54	24
01-6657-0-001	17	84
01-6658	18	01
01-6659	18	15
01-6660	18	13
01-6662	17	83
01-6678	59	16
01-6703	23	07
01-6706	32	07
01-6827-1	23	18
01-6847-0-003	25	28
01-6896-0-002	47	04
01-6928-0-001	60	32
01-6928-0-002	60	30
01-6943	35	33
01-6950-0-004	60	45
01-6973-0-001	18	18
01-6973-0-002	18	18
01-6973-0-003	18	18
01-7313-0-001	25	27
01-7313-0-001	60	10
01-7314-0-001	60	46
01-7401	21	02
01-7408	24	23
01-7409	24	05
01-7409	24	28
01-7411	24	08
01-7412	24	17
01-7413	23	06
01-7417	62	21
01-7418	62	25
01-7419	62	22
01-7420	62	26
01-7430	24	32
01-7430	25	07
01-7430	62	23
01-7431	24	31
01-7431	62	27
01-7432	62	17
01-7441	62	20
01-7442	21	06
01-7443	62	18
01-7446	62	24

PART NUMBER	PAGE	DET.
01-7447-1	16	19
01-7448	17	62
01-7452	62	29
01-7454	34	11
01-7456	34	15
01-7458	36	15
01-7459	62	32
01-7460	62	31
01-7461	62	30
01-7465	45	39
01-7475	36	26
01-7482	10	06
01-7487	52	16
01-7489	39	10
01-7492	56	11
01-7530	01	18
01-7530	04	06
01-8400	24	20
01-8401	21	20
01-8403	45	35
01-8404	45	36
01-8410	51	60
01-8416-0-002	60	02
<b>03-0000</b>		
03-0013	66	02
03-0019	64	30
03-0022	62	09
03-0054	64	01
03-0055	64	02
03-0056	64	03
03-0057	64	04
03-0059	64	05
03-0061	64	06
03-0063	64	07
03-0065	64	08
03-0066	64	09
03-0067	64	10
03-0068	64	31
03-0071	65	10
03-0072	64	32
03-0074	65	08
03-0076	65	15
03-0079	63	11
03-0081	63	12
03-0083	65	17
03-0085	63	13
03-0086	64	33
03-0090	63	03
03-0091-1	63	01
03-0092	63	02
03-0096	64	29
03-0097	64	27
03-0105	64	23
03-0106	64	34

PART NUMBER	PAGE	DET.
03-0107	64	35
03-0109	66	03
03-0115	66	05
03-0117	65	19
03-0121	66	01
03-0123	65	11
03-0133	64	28
03-0137	65	12
03-0139	65	01
03-0140	65	02
03-0141	65	03
03-0142	65	04
03-0143	65	05
03-0144	65	06
03-0145	63	09
03-0147	66	04
03-0148	65	13
03-0149	65	14
03-0161	64	24
03-0162	64	11
03-0163	65	07
03-0164	62	28
03-0169	63	07
03-0170	63	08
03-0174	65	20
03-0175	64	25
03-0176	64	12
03-0177	64	13
03-0179	64	26
03-0180	64	14
03-0181	64	15
03-0183	64	16
03-0187	65	18
03-0190	65	16
03-0193	63	06
03-0195	63	04
03-0258	63	10
03-0259	63	05
03-0263	65	09
<b>04-0000</b>		
04-0002-0-016	50	06
04-0002-0-017	50	06
04-0002-0-023	50	06
04-0002-0-047	50	06
04-0014	50	15
04-0055	56	33
04-0127	50	20
04-0129	37	51
04-0136	51	47
04-0137	51	48
04-0139-0-001	51	49
04-0143	50	17
04-0143	51	44
04-0145	50	18
04-0236-0-201	49	62
04-0236-0-201	61	56
04-0237-0-509	49	76
04-0250	06	27
04-0258-0-187	06	30
04-0258-0-187	36	16

PART NUMBER	PAGE	DET.
04-0258-0-251	51	46
04-0271-0-001	49	53
04-0273	49	47
04-0285-1	36	43
04-0285-1-001	36	43
04-0326-0-050	39	09
04-0327	49	60
04-0342-0-005	06	24
04-0386	58	14
04-0387	58	05
04-0388	38	13
04-0388	51	40
04-0388	58	19
04-0390-0-050	58	20
04-0391	49	77
04-0391	54	23
04-0391	56	21
04-0391	58	11
04-0391	59	12
04-0392	58	15
04-0393	58	09
04-0396	38	09
04-0396	39	15
04-0396	40	07
04-0396	51	41
04-0396	52	27
04-0396	54	15
04-0396	55	10
04-0396	59	23
04-0400	58	01
04-0401	58	13
04-0402	58	21
04-0404-0-050	58	04
04-0405	50	21
04-0405	58	02
04-0406	59	26
04-0407	59	25
04-0408	58	06
04-0408	59	27
04-0409	58	03
04-0424	59	28
04-0440	48	04
04-0442	51	55
04-0442	59	34
04-0443-1	54	14
04-0443-1	55	09
04-0451-1	56	24
04-0452	48	05
04-0453	48	09
04-0454	48	10
04-0455	48	14
04-0456	48	13
04-0457	48	12
04-0458	48	35
04-0459	48	11
04-0464	56	35
04-0467	26	25
04-0467	38	10
04-0467	39	16
04-0467	40	08

PART NUMBER	PAGE	DET.
04-0467	51	39
04-0467	52	11
04-0467	52	28
04-0467	54	16
04-0467	55	11
04-0467	59	24
04-0468	52	12
04-0474	49	72
04-0475	49	74
04-0476-1	48	17
04-0482	48	16
04-0489	48	06
04-0490-0-007	59	11
04-0490-0-022	59	09
04-0490-0-071	38	12
04-0490-0-073	40	09
04-0490-0-112	50	12
04-0490-0-176	59	10
04-0491	50	13
04-0493	58	10
04-0606	61	55
04-1002	51	33
04-1004	51	42
04-1014	48	31
04-1052	39	01
04-1053	39	03
04-1055	51	38
04-1056	51	34
04-1057	48	30
04-1058	49	79
04-1062	56	34
04-1069	58	23
04-1072	59	22
04-1073	59	21
04-1083	39	25
04-1083-0-001	50	23
04-1083-0-001	51	32
04-1086-0-001	59	04
04-1091	59	13
04-1120	51	31
04-1123	22	01
04-1124	22	10
04-1173	51	50
04-1215	22	04
04-1223	22	35
04-1223-0-004	49	66
04-1301	36	20
04-1319-0-002	40	21
04-1322	49	68
04-1358-1	17	57
04-1400	17	52
04-1534	50	18
04-1705	51	61
04-1705	59	32
04-1912	49	64
04-2003	39	18
04-2004	39	24
04-2094	55	32

PART NUMBER	PAGE	DET.
<b>05-0000</b>		
05-0001-0-001	17	80
05-0002-0-001	17	76
05-0005	17	75
05-0006	17	81
05-0058	50	25
05-0087-0-440	45	52
05-0087-0-450	45	52
05-0088-0-350	24	30
05-0088-0-350	50	07
05-0088-0-360	24	30
05-0088-0-360	50	07
05-0090	62	10
05-0091	02	06
05-0091	62	11
05-0092-1	62	15
05-0096	15	28
05-0103	66	07
05-0104	66	06
05-0106	62	16
05-0140	62	12
05-0192	62	13
05-0357-1	62	14
05-0369	37	56
05-0369	47	23
05-0369	51	30
05-0370	47	24
05-0381	15	27
05-0383-0-110	15	30
05-0394	37	55
05-0421	45	56
05-0422	45	57
05-0450-0-050	15	33
05-0455	48	18
05-1085-0-001	15	06
05-1085-0-002	15	04
05-1130	16	28
05-1182-0-001	61	53
05-1187-1	48	47
05-1302	16	30
06-0018	49	84
06-0170	17	71
06-0173	51	49
06-0291	48	48
06-0550	49	85
06-0590	49	83
06-0682	49	71
06-5001-0-001	49	52
<b>07-0000</b>		
07-0003-0-001	60	49
07-0093-0-001	61	50
07-0294	14	15
07-0294	14	17
07-0294	14	26
07-0294	38	17
07-0294	39	12
07-0294	39	20
07-0294	39	21

PART NUMBER	PAGE	DET.
07-0294	39	22
07-0294	39	23
07-0294	41	14
07-0294	41	15
07-0294	46	03
07-0294	46	04
07-0294	46	05
07-0294	46	06
07-0294	62	05
07-0387	35	40
07-0388	35	39
07-0420	41	28
07-0420	42	22
07-0568	41	13
07-0604	60	40
<b>20-0600</b>		
20-0603	16	36
20-0623	24	04
20-6261	52	09
20-6263	52	22
<b>30-0000</b>		
30-0007	21	32
30-0008	21	03
30-0009	21	05
30-0011	21	22
30-0011	37	57
30-0047	47	25
30-0114	32	14
30-0115	32	20
30-0131	24	29
30-0133	24	15
30-0134	24	11
30-0138	51	29
30-0141-0-050	24	07
30-0142	24	09
30-0143-2	24	25
30-0144-1	24	12
30-0145-1	24	24
30-0146	24	27
30-0160	28	19
30-0162	28	04
30-0163	28	12
30-0168	28	23
30-0169	28	24
30-0174	27	01
30-0175	27	12
30-0181	25	12
30-0194	13	03
30-0194	14	24
30-0194	31	16
30-0194	55	24
30-0218	25	08
30-0218	41	23
30-0226	25	03
30-0226	41	01
30-0226	45	34

PART NUMBER	PAGE	DET.
30-0259	22	21
30-0261	37	53
30-0265	29	06
30-0278	37	48
30-0278	51	45
30-0280	29	08
30-0280-0-001	29	08
30-0310	25	02
30-0342	44	03
30-0364	51	28
30-0386	33	43
30-0390	29	09
30-0390-0-001	29	09
30-0409	29	20
30-0478-0-625	49	63
30-0556	25	22
30-0763	50	24
31-0390	29	10
31-0390-0-001	29	10
31-0472	55	22
32-0307-0-001	49	82
32-0555	25	19
32-0557-0-100	25	20
32-0557-0-100	27	06
32-0560-0-050	47	20
32-0561-0-050	49	81
32-0565	27	24
<b>32-1000</b>		
32-1005	16	14
32-1006	16	12
32-1007	16	18
32-1009	16	38
32-1010	16	16
32-1011	16	26
32-1012-0-050	16	13
32-1012-0-050	21	01
32-1013	16	05
32-1014	16	08
32-1015-1	16	04
32-1017	16	29
32-1019	16	17
32-1020	16	06
32-1021-0-050	16	11
32-1022	17	43
32-1023	17	55
32-1024	17	55
32-1025-0-050	02	13
32-1025-0-051	02	13
32-1025-0-375	03	20
32-1025-0-500	03	20
32-1030	16	03
32-1034-0-050	16	39
32-1035-0-050	16	39
32-1036	62	04
32-2002	25	33
32-2003-0-050	25	30
32-2005	25	29
32-2006	25	04
32-2007	25	11
32-2008	25	13



PART NUMBER	PAGE	DET.
32-2009	60	01
32-2010	60	06
32-2011	60	07
32-2012	60	08
32-2013-0-050	60	09
32-2015	60	11
32-2016	60	12
32-2017	60	15
32-2018	60	18
32-2019-1	60	25
32-2020-0-050	61	64
32-2022-0-050	60	28
32-2025-0-050	61	60
32-2027-0-050	60	35
32-2030-0-050	60	38
32-2034	60	39
32-2035	61	61
32-2036	61	62
32-2037	60	23
32-2038	61	63
32-2040	23	27
32-2045-0-050	32	08
32-2046	33	29
32-2061	23	27
32-2062	23	29
32-2063	23	24
32-2064	23	13
32-2065-0-050	23	02
32-2067	23	27
32-2100-0-050	56	07
32-2102-0-001	56	03
32-2102-0-002	56	06
32-2105	56	01
32-2106-0-001	56	08
32-2106-0-002	56	01
32-2107	56	02
32-2108	14	21
32-2109	14	20
32-2110-0-050	02	09
32-2110-0-050	12	01
32-2119	23	27
32-2120	22	38
32-2125	23	27
32-2126	23	27
32-2129	14	18
32-2131	01	14
32-2132	01	14
32-2133	10	04
32-2134	36	03
32-2142-0-050	10	31
32-2151	35	31
32-2152	35	28
32-2153	35	29
32-2161	38	02
32-2162	38	06
32-2163	38	01
32-2164	38	11
32-2166	38	08
32-2167-0-050	38	24
32-2170	38	20

ART NUMBER	PAGE	DET.
32-2170	40	01
32-2173	40	14
32-2174	61	51
32-2176-0-050	24	03
32-2186	61	59
32-2187	33	34
32-2193-0-050	60	29
32-2194	60	43
32-2195	60	42
32-2196	60	41
32-2197-0-050	60	26
32-2207-0-050	60	29
32-2208	60	18
32-2209	02	14
32-2210	02	14
<b>32-3000</b>		
32-3008	59	31
32-3009	57	16
32-3009	59	29
32-3010	57	15
32-3011	57	11
32-3012	50	01
32-3013	57	04
32-3014	58	24
32-3015	57	03
32-3016	57	02
32-3017	57	08
32-3018	57	05
32-3019	57	01
32-3019	59	02
32-3020	57	14
32-3020	59	03
32-3021	48	44
32-3022	49	78
32-3023	59	06
32-3024	57	13
32-3025	57	12
32-3026	57	10
32-3027	57	09
32-3028	59	07
32-3029	59	01
32-3031	48	01
32-3031	58	07
32-3032	13	11
32-3033-0-050	17	73
32-3035	48	36
32-3036	48	40
32-3037	52	25
32-3038	48	38
32-3043	59	30
<b>40 0000</b>		
40-0010	21	26
40-0050-0-050	21	25
40-0051	10	29
40-0053	10	26
40-0059	23	16
40-0070-0-071	05	13
40-0070-0-072	05	02

PART NUMBER	PAGE	DET.
40-0079	01	04
40-0085	01	03
40-0087	01	06
40-0119	33	31
40-0151-0-050	24	22
40-0161	28	17
40-0190	14	01
40-0191	14	05
40-0203	14	21
40-0218-1	31	09
40-0218-1	39	04
40-0218-1	55	30
40-0236	45	33
40-0249-1	31	14
40-0252	12	31
40-0252	13	01
40-0262-0-118	50	14
40-0262-0-133	47	10
40-0308	31	18
40-0309	31	25
40-0310-1	14	12
40-0310-1	31	26
40-0310-1	39	13
40-0310-1	55	28
40-0332-1	01	08
40-0347	45	53
40-0387	33	24
40-0388	32	22
40-0388-0-017	32	22
40-0412	10	28
40-0413	10	15
40-0414-1	10	23
40-0418-2-001	18	23
40-0418-2-002	18	28
40-0428-1-001	18	24
40-0428-1-002	18	27
40-0434	06	11
40-0436-2-051	18	32
40-0436-2-052	18	34
40-0437	18	33
40-0438-1	32	18
40-0444	23	04
40-0445-1-800	23	05
40-0453-1	13	09
40-0454	29	01
40-0457	31	32
40-0457	33	42
40-0459-0-003	22	07
40-0461	33	35
40-0465	21	27
40-0466	21	16
40-0467	21	19
40-0472-1	13	06
40-0475	16	34
40-0476	05	15
40-0478-0-008	15	11
40-0496-1	36	08
40-0500-1-050	36	34
40-0501	36	36
40-0502-1	36	32

PART NUMBER	PAGE	DET.
40-0506	18	06
40-0506	43	12
40-0512	25	09
40-0512	41	09
40-0512	46	08
40-0513	25	01
40-0513	46	07
40-0514-1	35	12
40-0519-2	14	16
40-0519-2	39	14
40-0524	42	07
40-0528	13	12
40-0531	36	35
40-0533	22	18
40-0533	33	36
40-0533	52	05
40-0539	22	14
40-0547	12	14
40-0547	22	13
40-0564	41	16
40-0566	21	21
40-0567	21	31
40-0574	41	24
40-0574	42	18
40-0574	45	26
40-0575-2	14	13
40-0575-2	31	10
40-0575-2	39	02
40-0575-2	41	12
40-0575-2	55	26
40-0578	22	23
40-0580-1	22	28
40-0582	40	27
40-0583	40	31
40-0586	14	27
40-0586	43	01
40-0586	46	13
40-0586	62	02
40-0593	21	17
40-0594	41	26
40-0594	42	20
40-0594	44	10
40-0594	44	13
40-0594	46	09
40-0594	46	11
40-0594	62	03
40-0596	02	01
40-0598	44	17
40-0603	41	07
40-0603	42	14
40-0604	42	23
40-0606	42	15
40-0607	42	09
40-0610	27	10
40-0610	29	16
40-0613	02	05
40-0614	02	07
40-0618-2	18	19
40-0625	34	01
40-0640	38	21

PART NUMBER	PAGE	DFT.
40-0640	40	02
40-0640	56	23
40-0648	10	12
40-0650	48	37
40-0676	01	24
40-0676	03	16
40-0695	27	05
40-0700-0-151	03	08
40-0700-0-152	03	05
40-0700-2-100	03	17
40-0708	10	25
40-0717-2-375	02	14
40-0717-2-375	03	21
40-0717-2-500	02	14
40-0717-2-500	03	21
40-0718	45	22
40-0719	44	01
40-0720	44	18
40-0721	45	21
40-0722	44	09
40-0723	45	27
40-0724	45	47
40-0725	45	49
40-0726	45	38
40-0727	45	42
40-0728	45	41
40-0729	44	07
40-0730	45	25
40-0731	44	04
40-0732	45	40
40-0733-1-050	45	31
40-0734	45	24
40-0735	45	46
40-0737	45	23
40-0744-1	14	25
40-0759	18	31
40-0760-1	18	36
40-0762-1	05	12
40-0762-1	62	08
40-0767-1-101	03	08
40-0767-1-102	03	05
40-0771	36	40
40-0772	36	29
40-0773	36	06
40-0775-0-850	36	27
40-0776	36	44
40-0777	36	39
40-0781	15	26
40-0782-1	15	23
40-0785	15	21
40-0786-1	15	15
40-0787	15	17
40-0788	15	13
40-0789-0-050	15	24
40-0791	15	07
40-0803-1	15	18
40-0808	06	28
40-0809	06	21
40-0816	38	19
40-0826	41	25

PART NUMBER	PAGE	DET.
40-0826	42	19
40-0826	44	11
40-0826	44	12
40-0826	46	10
40-0826	46	12
40-0826	62	06
40-0832-0-001	35	19
40-0832-0-002	35	09
40-0834-0-004	15	14
40-0834-0-008	15	14
40-0841	35	16
40-1013	44	06
<b>41-0000</b>		
41-0034-0-001	17	59
41-0034-0-002	17	59
41-0070-0-071	05	13
41-0070-0-072	05	02
41-0072-0-002	01	21
41-0075	12	26
41-0076-0-001	12	32
41-0076-0-002	12	25
41-0080	01	17
41-0080	06	03
41-0081	06	01
41-0086	06	12
41-0088	06	06
41-0089-0-570	05	11
41-0089-0-670	05	11
41-0089-0-770	05	11
41-0089-0-870	05	11
41-0202	14	20
41-0229-2-050	14	23
41-0247	31	20
41-0248	31	23
41-0257	17	66
41-0427-1	10	04
41-0433	04	07
41-0433	06	02
41-0449	33	30
41-0451-0-001	12	18
41-0451-0-001	34	14
41-0451-0-002	12	12
41-0452-0-003	12	22
41-0452-0-004	12	11
41-0456-0-070	22	22
41-0468	05	07
41-0474-1	31	06
41-0540	12	23
41-0540-0-017	12	23
41-0540-0-070	12	23
41-0540-0-071	12	23
41-0579	22	29
41-0583	40	31
41-0584	40	26
41-0615	10	03
41-0621	34	06
41-0622	34	13
41-0623	34	09
41-0624	34	05

PART NUMBER	PAGE	DET.
41-0640	38	21
41-0640	40	02
41-0677	22	30
41-0680	03	11
41-0680	12	30
41-0681	14	18
41-0682	22	34
41-0683	10	27
41-0702-0-070	22	20
41-0708	10	25
41-0796	06	15
<b>42-0000</b>		
42-0037	16	25
42-0046-0-050	47	06
42-0063-1-050	23	17
42-0071-0-003	01	19
42-0071-0-004	01	11
42-0071-0-007	01	14
42-0071-0-010	01	14
42-0071-0-020	01	14
42-0073-0-001	04	09
42-0073-0-002	04	02
42-0073-0-003	04	14
42-0073-0-004	04	01
42-0073-0-010	04	02
42-0073-0-020	04	09
42-0100	12	06
42-0154-1	23	01
42-0154-2-050	23	01
42-0262-0-112	47	16
42-0262-0-114	37	54
42-0262-0-114	47	02
42-0262-0-115	36	45
42-0262-0-115	47	01
42-0262-0-117	47	17
42-0262-0-118	47	09
42-0262-0-130	22	36
42-0262-0-135	47	19
42-0262-0-151	50	16
42-0262-0-155	37	47
42-0262-0-155	47	22
42-0262-0-155	48	32
42-0262-0-158	49	75
42-0262-0-160	47	18
42-0262-0-161	47	15
42-0262-0-171	49	73
42-0262-0-180	49	70
42-0262-0-181	49	69
42-0262-1-116	06	25
42-0262-1-119	47	11
42-0262-1-152	51	43
42-0262-1-162	47	12
42-0262-1-162	50	22
42-0262-2-110	47	03
42-0262-3-116	43	02
42-0262-3-116	47	05
42-0272-1-001	48	45
42-0287	26	08
42-0290-1	26	22

PART NUMBER	PAGE	DET.
42-0328-0-001	55	03
42-0328-0-002	54	25
42-0349-1	58	22
42-0352-0-001	51	51
42-0352-0-002	51	52
42-0352-0-625	51	51
42-0352-0-626	51	52
42-0353	45	55
42-0387	32	11
42-0389	32	21
42-0438	32	12
42-0450	31	01
42-0498	36	07
42-0516	14	14
42-0525	43	08
42-0554	56	22
42-0578	22	24
42-0582	40	27
42-0595-0-002	02	12
42-0595-0-002	03	09
42-0597	02	03
42-0597-0-002	03	09
42-0598	41	27
42-0598	42	21
42-0619	18	17
42-0637-0-450	38	20
42-0637-0-450	40	01
42-0640	38	21
42-0640	40	02
42-0692	18	11
42-0703	56	04
42-0703-2-001	56	05
42-0706-1-050	49	65
42-0715	22	32
42-0769	36	13
<b>42-0800</b>		
42-0807	48	08
42-0813	56	12
42-0828	10	02
42-0829	10	01
42-0846-1	04	05
42-0850	52	02
42-0852	52	20
42-0853	52	14
42-0854	52	31
42-0854-0-001	52	26
42-0855	52	24
42-0857	52	13
42-0858	54	03
42-0860	54	04
42-0861	26	28
42-0862	54	06
42-0864	54	20
42-0865	54	21
42-0866	54	07
42-0867	54	11
42-0868	54	18
42-0869	26	24
42-0872	56	16

PART NUMBER	PAGE	DET.
42-0873	56	15
42-0874	56	19
42-0875	55	20
42-0876	36	21
42-0877	36	12
42-0880-1	26	11
42-0881	26	10
42-0883	26	15
42-0885-1	55	19
42-0886	26	21
42-0887	26	17
42-0888	26	12
42-0889-1	55	38
42-0890	55	35
42-0891	26	16
42-0892	26	07
42-0893	26	18
42-0894	55	29
42-0895-1	55	33
42-0896-0-006	17	56
42-0899	18	04
42-0900	18	05
42-0901	18	16
42-0902	17	50
42-0903	17	51
42-0904	49	48
42-0905	39	08
42-0908	39	19
42-0909	41	29
42-0909	42	01
42-0910	39	27
42-0911	41	04
42-0911	42	03
42-0913	41	02
42-0913	42	02
42-0914	41	03
42-0914	42	04
42-0919	39	17
42-0924	38	15
42-0925	52	29
42-0927	35	20
42-0929	38	18
42-0930	38	16
42-0931	38	22
42-0931	40	05
42-0931	62	07
42-0934	51	57
42-0935	51	56
42-0936	48	03
42-0938	48	46
42-0939	40	06
42-0942	40	04
42-0945	39	26
42-0947	56	30
42-0948	40	24
42-0951	54	01
42-0952	31	12
42-0952	41	11
42-0952	46	02
42-0953	31	13

PART NUMBER	PAGE	DET.
-42-0953	41	20
42-0953	46	01
42-0955	17	64
42-0989-0-050	27	21
42-1002-0-001	15	05
42-1002-0-002	15	03
42-1005	15	01
42-1007	17	67
42-1030	55	17
42-1031-1	55	16
42-1032	55	15
42-1033	55	08
42-1038	56	17
42-1040	23	22
42-1041	23	21
42-1048	41	17
42-1049	41	18
42-1050	41	22
42-1051	43	13
42-1052	42	06
42-1053	42	10
42-1054	42	11
42-1058	13	02
42-1058	31	17
42-1058	55	27
42-1059	14	02
42-1060	55	34
42-1061	42	12
42-1208	17	68
42-1212	55	37
42-1282	33	23
42-1470	55	13
42-1519	32	09
42-1520	32	10
42-1600	12	02
42-1624	12	20
43-2229	56	26
43-2505	12	33
44-0533	31	33
44-0966-2	60	36
44-2075	35	05
44-2076	35	30
44-2077	35	38
44-2078	35	37
44-2079	35	35
44-2082	35	34
44-2102-1	35	04
44-2102-1	36	04
60-0079	06	32
60-0079	17	58