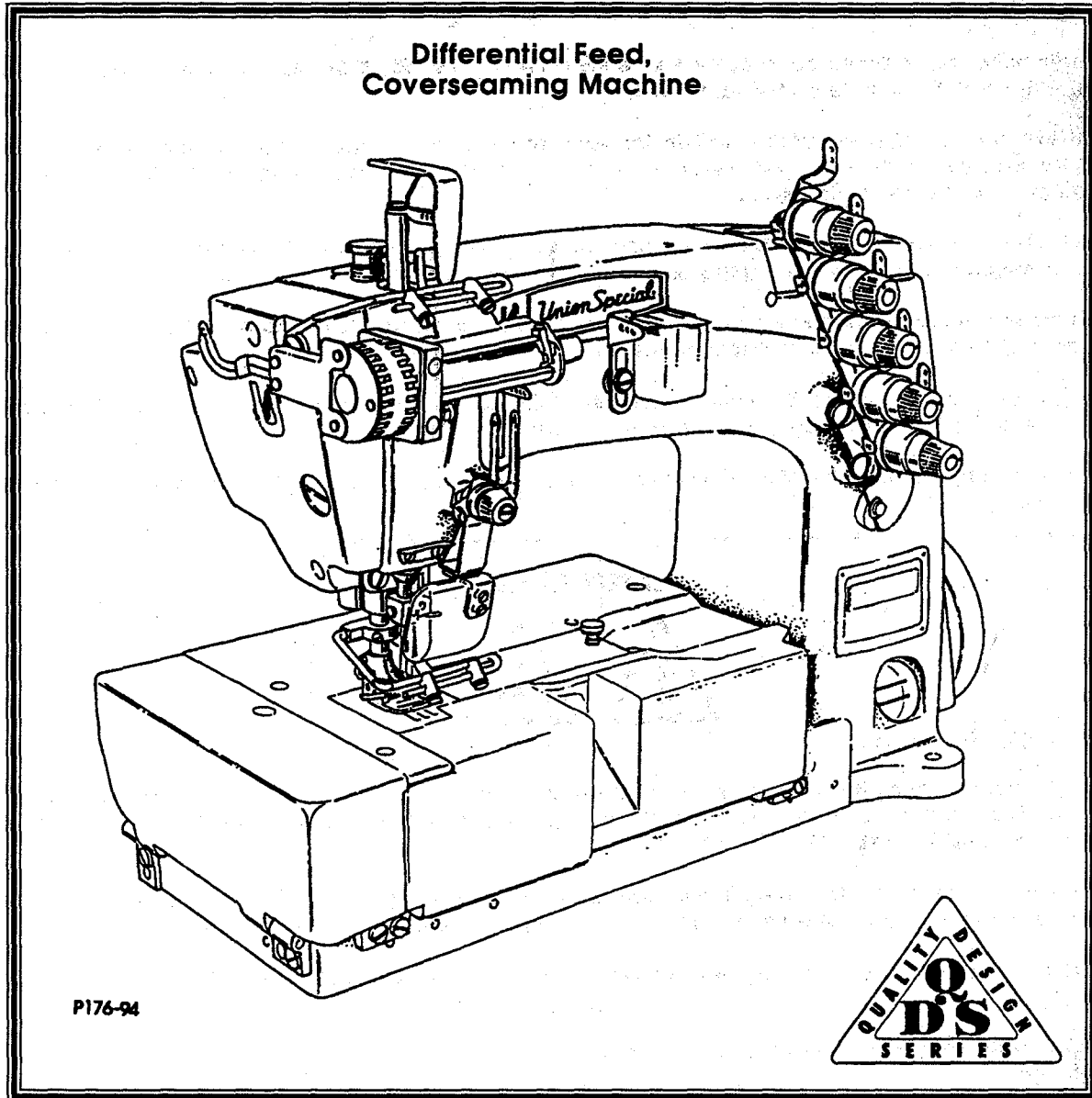


# Union Special

INDUSTRIAL SEWING EQUIPMENT

## ADJUSTING INSTRUCTIONS



MANUAL NO. IN9403

STYLES

FS133E270MBU060

# Manual No. IN9403 Adjusting Instruction for FS100 Series Machines

First Edition Copyright 1994

By

Union Special Corporation Rights Reserved In All Countries

Printed in U.S.A. February 1994

## PREFACE

This parts manual has been prepared to guide you while adjusting the FS100 Series machines. It can be used in conjunction with Union Special Parts Manual PT9402.

This manual explains in detail the proper setting for each of the components related to forming the stitch and completing the functions of the machine. Illustrations are used to show the adjustments and reference letters are used to point out specific items discussed.

Careful attention to the instructions for operating and adjusting these machines will enable you to maintain the superior performance and reliability designed and built into every Union Special machine.

Adjustments are presented in sequence so that a logical progression is accomplished. Some adjustments performed out of sequence may have an adverse effect on the function of the other related parts.

This manual has been comprised on the basis of available information. Changes in design and/or improvements may incorporate a slight modification of configuration in illustrations or part numbers.

On the following pages will be found illustrations and terminology used in describing the adjustments for the FS100 Series machines.

## SAFETY RULES



### General Operating Directions

The sewing machines described in this instruction manual are prohibited from being put into service until it has been ascertained that the sewing units, in which these sewing machines will be built-in have conformed with the EC Council Directives (89/392/EEC, Annex II B).

1. Before putting the machines described in this manual into service, carefully read the instructions. The starting of each machine is only permitted after taking notice of the instructions and by qualified operators.

**IMPORTANT!** Before putting the machine into service, also read the safety rules and instruction from the motor supplier.

2. Observe the national safety rules valid for your country.
3. Each machine is only allowed to be used as foreseen. The foreseen use of the particular machine is described in paragraph "STYLES OF MACHINES" of this instruction manual. Another use, going beyond the description, is not as foreseen.
4. All safety devices must be in position when the machine is ready for work or in operation. Operation of the machine without the appertaining safety devices is prohibited.
5. The following safety devices are components of the sewing machines: Fingerguard, needle lever eyelet guard, needle bar guard, needle break protection shield and handwheel-belt guard.
6. When gauge parts are exchanged (e.g. needle, presser foot, needle plate, feed dog and bobbin) during threading, when the operator leaves the workplace, and during service work, the machine must be isolated from the main power by switching off the main switch or disconnecting the main plug. On mechanically operated clutch motors without a start inhibitor it is necessary to wait until the motor has stopped.

7. Wear safety glasses.
8. In case of machine conversions and changes all valid safety rules must be considered. Conversions and changes are made at your own risk.
9. Commissioning of the sewing head is prohibited until such time as the entire sewing unit is found to comply with EC regulations.
10. The warning hints in the instructions are marked with one of these two symbols:



Items require special attention



Danger of injury to operative or service staff

Be sure to observe and adhere to these indications and to the generally applicable regulations.

### Special Operating Directions

11. For the following the machine has to be disconnected from the power supply by turning off the main switch or by pulling out the main plug:
  - 11.1 For threading needle(s), looper, spreader etc.
  - 11.2 For replacing sewing parts such as needle, presser foot, throat plate, looper, spreader, feed dog, needle guard, folder, fabric guide etc.
  - 11.3 When leaving the workplace and when the workplace is unattended.
  - 11.4 For maintenance work.
  - 11.5 When using clutch motors without actuation lock, wait until the motor is stopped totally.

### General Maintenance Directions

12. Maintenance, repair and conversion work (see item 8) must be done only by trained technicians or special skilled personnel under consideration of the instructions.
13. Any work on the electrical equipment must be done by an electrician or under direction and supervision of special skilled personnel.

### Special Maintenance Directions

14. Work on parts and equipment under electrical tension is not permitted. Permissible exceptions are described in the applicable sections of standard sheet DIN VDE 0105.
15. Before doing maintenance and repair work on the pneumatic equipment, the machine has to be disconnected from the compressed air supply. In case of existing residual air pressure after disconnecting from compressed air supply (e.g. pneumatic equipment with air tank), the pressure has to be removed by bleeding.

Exceptions are only allowed for adjusting work and function checks done by special skilled personnel.

### Standards

17. The sewing machines described in this manual are built according to the following standards:
  - EN292-2 Safety of machinery-basic concepts, general principles for design.
  - IEC204-3-1/EN60204-3-1 Electrical equipment of industrial machines. Part 3: Particular requirements for sewing machines, units and systems.

## CONTENTS

IDENTIFICATION OF MACHINES .....	5
MACHINE STYLE .....	5
LUBRICATION .....	6
NEEDLES .....	6
THREADING .....	7
ADJUSTING INSTRUCTIONS .....	8
THREADING AND OILING DIAGRAM FOR FS100 SERIES MACHINES .....	8
NEEDLE BAR ALIGNMENT .....	8
SYNCHRONIZING LOOPER AND NEEDLE MOTIONS .....	8
SYNCHRONIZING LOOPER AND NEEDLE MOTIONS (CONT.) .....	9
LOOPER SETTINGS .....	9
LOOPER SETTINGS (CONT.) .....	10
NEEDLE BAR HEIGHT .....	10
MAIN AND DIFFERENTIAL FEED DOGS .....	10
MAIN AND DIFFERENTIAL FEED DOGS (CONT.) .....	11
DIFFERENTIAL FEED RATIO .....	11
CHANGING STITCH LENGTH .....	11
REAR NEEDLE GUARD .....	12
FRONT NEEDLE GUARD .....	12
THREAD TENSION RELEASE .....	12
SPREADER ADJUSTMENTS .....	12
SPREADER ADJUSTMENTS (CONT.) .....	13
THREAD TENSION .....	13
NEEDLE THREAD FRAME EYELET .....	14
SPREADER THREAD TAKE-UP .....	14
LOOPER THREAD TAKE-UP .....	14
SPREADER THREADING .....	15
PRESSER BAR HEIGHT .....	15
PRESSER FOOT PRESSURE .....	15
TORQUE REQUIREMENTS .....	15
METERING DEVICE .....	15
METERING DEVICE (CONT.) .....	16
JUMPER ADJUSTMENTS .....	15
POTENTIOMETER ADJUSTMENTS .....	16
UNDER TRIMMER .....	16
UNDER TRIMMER (CONT.) .....	17
SPECIAL INSTRUCTIONS .....	17
NEEDLE LEVER .....	17
ALIGNMENT MAIN SHAFT TO CRANKSHAFT .....	18

## IDENTIFICATION OF MACHINES

Each Union Special machine carries a style number, which on this class machine is stamped in the style plate affixed to the right front of the machine.

The serial number is stamped in the casting at the right rear base of machine.

**FS133E270MBU060**

**COLLARETTE: Three needle, differential feed, medium capacity with upper elastic metering device (two stage) lower fabric undertrimmer and pneumatic elastic cutter - Typical application - For attaching 3/16" to 1 1/2" wide elastic from a roll, to panties and lingerie. Requires workstation number WS42800BK10A. Seam specifications 605 LSb-1. Standard Gauge Number 060, 15/64" (6.0 mm). Maximum recommended speed 5500 R.P.M. Recommended needle 121GBS, size 080/032.**

## LUBRICATION

Use a straight mineral oil with a say-bolt viscosity of 90 to 125 seconds at 100 degrees Fahrenheit. This is equivalent to Union Special specification No. 175.

Before operating, fill machine with oil at plug screw (A, Fig. 1). While filling machine with oil, check gauge (B). When proper oil level is reached, the oil level should appear in the center between the two lines on gauge (B). It is recommended to

always check oil level before operating, to be sure machine is filled between the lines. CAUTION DO NOT over fill machine.

On new machines, or a machine out of service where the felts and bearings are dry; lubricate machine as follows:

Remove head cover, clean out lint, then directly oil needle bar link (A, Fig. 2) and needle bar (B). Replace head cover and fill machine with oil to proper level. Run machine at between 200 and 500 R.P.M. to ensure proper lubrication of components preventing any damage which may occur from lack of oil distribution.

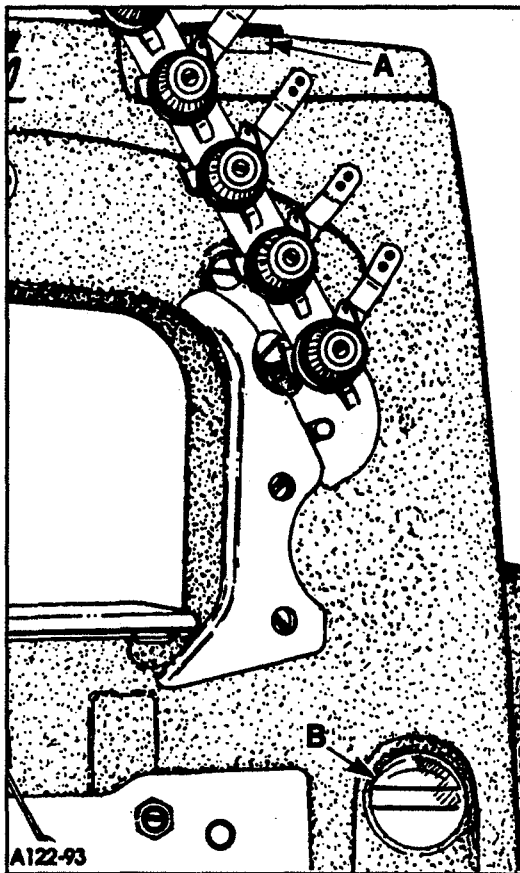


FIG. 1

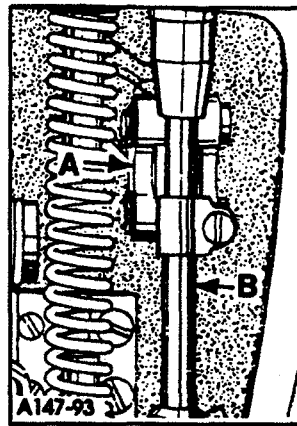


FIG. 2

## NEEDLES

Each needle has both a type and size number. The type number denotes the kind of shank, point, length, groove, finish and other details. The size number, stamped on the needle shank, denotes largest diameter of blade, measured midway between shank and eye. Collectively, type and size number represent the complete symbol, which is given on the label of all needles packaged and sold by UNION SPECIAL. The standard recommended needle for machines

Needle Type	Description	Sizes Available
*121 GBS	Round shank, round point, short single groove, struck groove, spotted, ball point, chromium plated.	065/025, 070/027, 075/029, 080/032, 090/036, 100/040
121 GJS	Round shank, round point, short double groove, struck groove, conical blade, chromium plated, pontoon scarf.	055/022, 060/024, 065/025, 070/027, 075/029, 080/032
121 GKS	Round shank, new round point, short double groove, struck groove, reinforced blade, pontoon scarf, chromium plated.	055/022, 060/024, 065/025, 070/027, 075/029, 080/032, 090/036, 100/040, 110/044, 125/049, 140/054
126 GS	Short, double groove, struck groove, ball eye, chromium plated.	080/032, 100/040, 140/054

\*The standard needle type recommended by Union Special Corporation.

Table I

covered by this adjusting manual is Type 121 GBS, Size 080/032. See Table I for description and sizes available.

To have needle orders promptly and accurately filled, an empty package, a sample needle or type and size number should be forwarded. Use description on label. A complete order would read "1000 needles, Type 121 GBS, Size 080/032".

## THREADING

Thread machine as illustrated in Fig. 3. If needle thread take-up wire is used, it should be set to barely contact **RIGHT** needle thread (**G**) ONLY, at bottom of needle bar stroke.

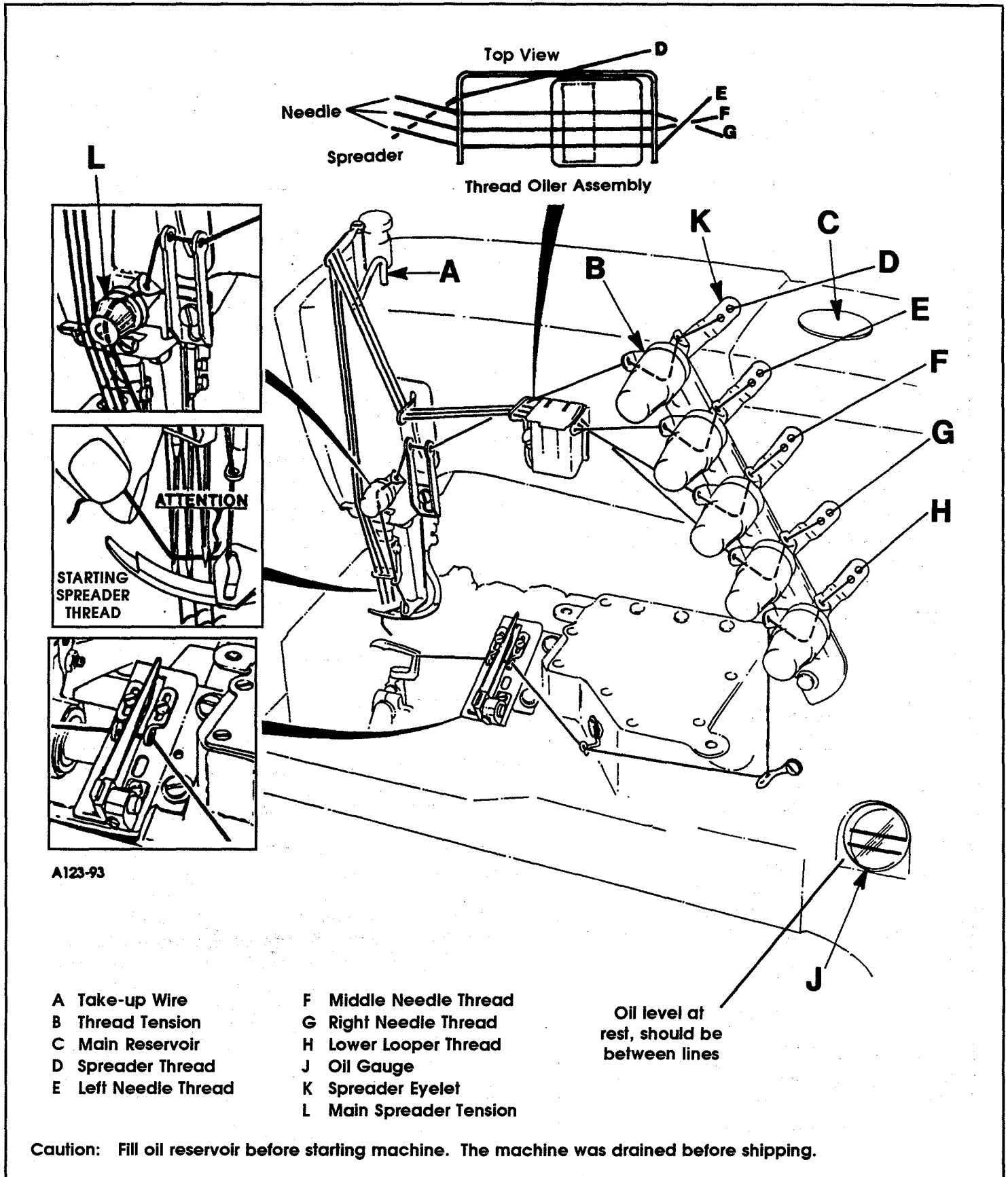


FIG. 3

## ADJUSTING INSTRUCTIONS

**NOTE:** Instructions stating direction of location, such as right, left, front or rear of machine, are given relative to operator's position at the machine. The handwheel rotates counterclockwise, in operating direction; when viewed from the right end of machine.

### THREADING AND OILING DIAGRAM FOR FS100 SERIES MACHINES

Thread machine as indicated. Three needle machine illustrated, but two needle machines are threaded in a similar manner. Needle thread take-up wire (A, Fig. 3) should be set to contact only the RIGHT needle thread (G) when needle bar is at bottom of stroke on all Styles.

**NOTE:** Some threads will not require the use of the needle take-up wire as the thread will produce an adequate needle loop.

Oil has been drained from machine before shipping and the reservoir must be filled before starting to operate. Refer to "LUBRICATION".

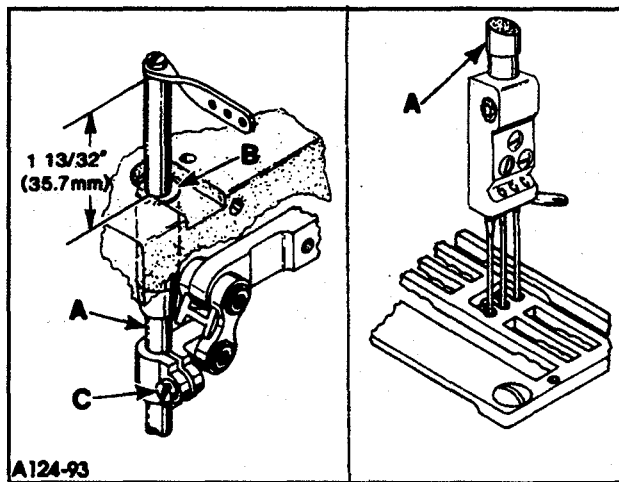


FIG. 4

### NEEDLE BAR ALIGNMENT

Insert a new set of needles. With needle bar (A, Fig. 4) at top of its stroke, check to ensure an approximate setting of  $1 \frac{13}{32}$ " (35.7mm) from top of needle bar to top of needle bar bushing (B). Adjustment can be made by loosening clamp screw (C) and moving needle bar up or down, retighten screw (C) TEMPORARILY. Turn handwheel to bring needle bar down to ensure that needles center in needle holes of throat plate as shown in Fig. 4. Adjustment can be made by loosening screw (C) slightly, allowing needle bar to be turned as required, being careful not to change the temporary height setting. Tighten clamp screw (C). Re-check temporary height setting.

### SYNCHRONIZING LOOPER AND NEEDLE MOTIONS

Check Synchronization using gauge No. TT-34 as follows:

With looper rocker (A, Fig. 5) at extreme right end of travel, insert pin (B) furnished with gauge in looper hole of looper rocker. Assemble gauge plate (C) to throat plate seat using throat plate mounting screws (D). Insert shank of indicator (E) into hole used for needle thread take-up wire in top of machine bed. Turn handwheel in operating direction until pin contacts edge of gauge plate. Adjust pointer on left end of indicator until it rests on top of needle bar (F) and its pointer on the right end aligns with the marking "0", then lock indicator in position using the set screw (G) in front of machine bed for securing the take-up wire. Turn handwheel in reverse direction until pin again contacts edge of gauge plate, then note reading on indicator. If pointer aligns with "0" on scale, looper and needle motions are synchronized. A variation of one graduation is permissible. If the reading is above "0" on scale, the looper drive lever rocker shaft must be moved to the front. If the reading is below "0" on the scale, the shaft must be moved to the rear.

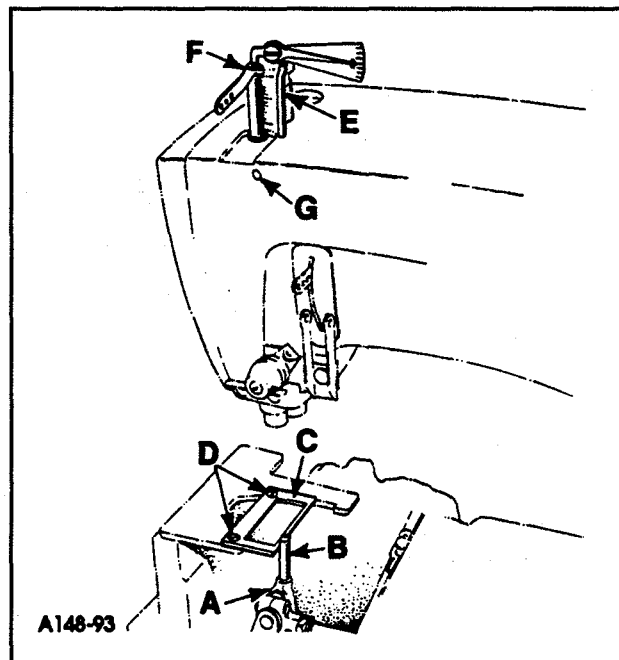


FIG. 5



## SYNCHRONIZING LOOPER AND NEEDLE MOTIONS (CONT.)

If gauge No. TT-34 is not available, check synchronization as follows:

Insert looper into the looper rocker, pushing it all the way down and tighten screw against flat on shank of looper. Turn handwheel in the operating direction until the point of the looper (A, Fig. 6) moving to the left, is even with the left side of the right needle (B). Note the height of the eye of the needle with respect to the looper point. (See Fig. 7). Turn the handwheel in the reverse direction until the point of the looper again moving to the left, is even with the left side of right needle (See Fig. 7). If the height of the eye of the needle with respect to the looper point are the same, looper and needle motions are synchronized - a variation of .005" (.127mm) is allowable.

If the distance from the eye of the needle to the point of the looper is greater when the handwheel is turned in the operating direction, the looper drive lever rocker shaft will have to be moved slightly towards the rear. Moving the shaft towards the front acts the reverse.

Adjust looper drive rocker lever shaft (synchronization) as follows:

Remove cloth plate, top reservoir cover, back reservoir cover and plug screw. Loosen screws (A & B Fig. 7A) so that they are snug on shaft (C) and synchronize as usual. If shaft (C) moved to the rear, tighten screw (B) and thrust collar (E) against interior wall, while holding lever (D) against exterior wall to remove shake. If shaft (C) moved to the front, tighten screw (A) and thrust lever (D) against exterior wall, while holding collar (E) against interior wall to remove shake.

**NOTE:** After completing the above procedure the distance from the center line of rocker cone to the center of the looper drive lever stud should be  $4 \frac{1}{16}$ " (103.2mm).

With looper at extreme right end of travel, check location of the right looper connecting rod bearing (A, Fig. 8) using gauge No. TT-35. Place hole of gauge (B) over threaded stud, then set the left inside edge of gauge against the right side of looper rocker cone (C) as shown. At this time, there should be no clearance between left inside edge of gauge and right side of cone (C). If adjustment is necessary, loosen clamp screw (D) and reposition looper drive lever (E) as required, then tighten screw (D).

If gauge No. TT-35 is not available, check setting with a scale. Distance between the centerline of rocker cone and centerline of looper drive lever stud should be  $4 \frac{1}{16}$ " (103.2mm) as shown in Fig. 8; when looper is at its extreme right end of travel.

### LOOPER SETTINGS

Insert a new needle of type and size required into right needle seat. Turn hand wheel in operating direction until looper is at its extreme right end of travel. Looper gauge (A, Fig. 9, see Table II for dimensions) is the distance between centerline of right needle (B) and point of looper (C).

Adjustment can be made by loosening nuts (D and E). Turn connecting rod (F) as required to attain the dimension. Hold connecting rod in position and tighten nut (E), then nut (D).

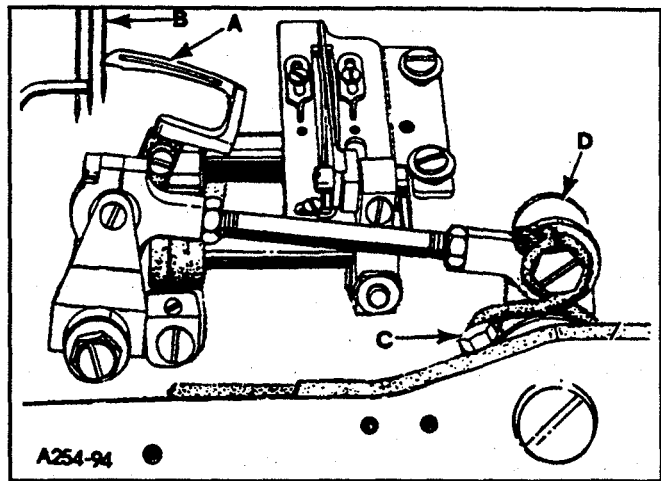


FIG. 6

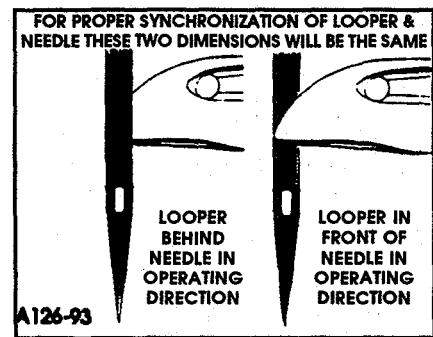


FIG. 7

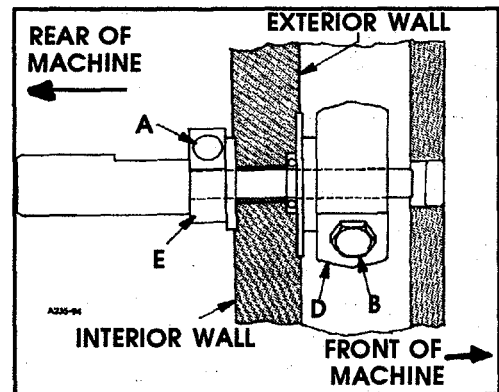


FIG. 7A

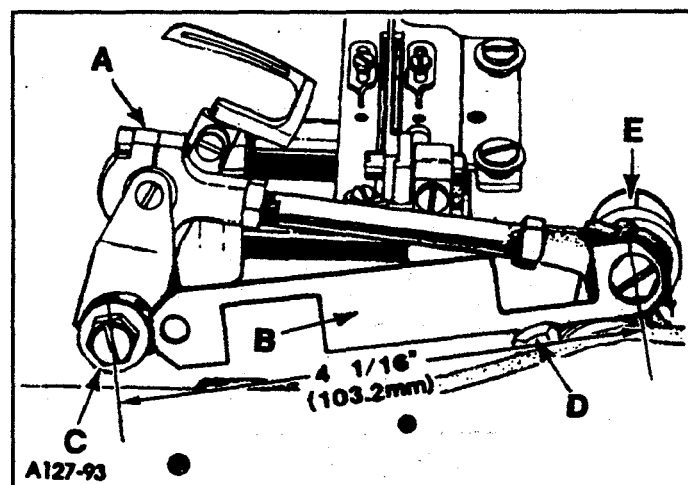


FIG. 8

## LOOPER SETTINGS (CONT.)

Machine Style	Dimension (A, Fig. 9)	Available Looper Gauge No.
* All 064 Gauge Styles	3/16" (4.8mm)	21225-3/16
All 032, 040, and * 048 Gauge Styles	7/32" (5.6mm)	21225-7/32
*Reduce by one gauge for knit material machines		

Table II

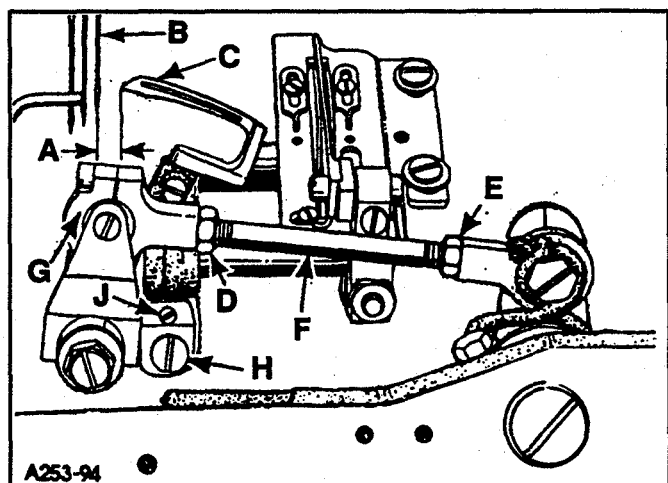


FIG. 9

**NOTE:** Be sure that the left ball joint (G) is in a vertical position and does not bind after adjustment.

While turning handwheel in operating direction, as the looper (A, Fig. 10) moves to the left its point should be set to brush but not pick at the REAR of RIGHT needle (B). Adjustment can be made by loosening screw (H, Fig. 9), turn stop screw (J) clockwise to move looper towards the rear, counterclockwise acts the reverse. It is suggested to hold looper towards the front while making this adjustment. Tighten screw (H) after adjustment has been made and recheck movement of looper.

### NEEDLE BAR HEIGHT

Turn handwheel in operating direction until point of looper is flush with the left side of left needle. Final setting is 3/64" (1.2mm) between top of needle's eye and bottom surface of looper (See Fig. 7). If adjustment is required, loosen screw (C, Fig. 4) move needle bar CAREFULLY up or down, not to disturb alignment of same. Retighten screw (C) and check to ensure that the needles center in needle holes of throat plate.

### MAIN AND DIFFERENTIAL FEED DOGS

Both feed dogs should be set to rise the depth of a full tooth, approximately 3/64" (1.2mm) above throat plate at highest point of travel and centered in slots of throat plate at maximum feed travel.

Height adjustment can be made by loosening screws (A, Fig. 11) for differential feed dog (B); screw (D) for main feed dog (C). Raise or lower as required and adjust screw (E) to support main feed dog (C) before tightening screw (D).

To center main feed dog in throat plate slots, front to back or differential feed dog, left to right, loosen screws (A and H, Fig. 12), reposition feed rocker (B) slightly as required, retighten screws. Loosen screws (C) allowing main feed dog to be centered in throat plate slots left to right, retighten screws.

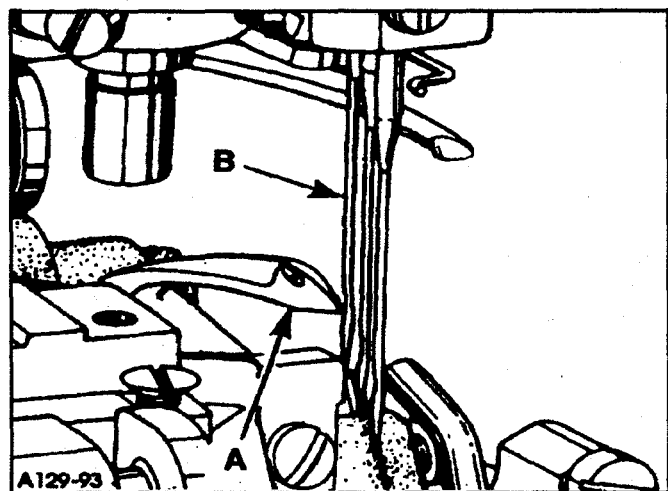


FIG. 10

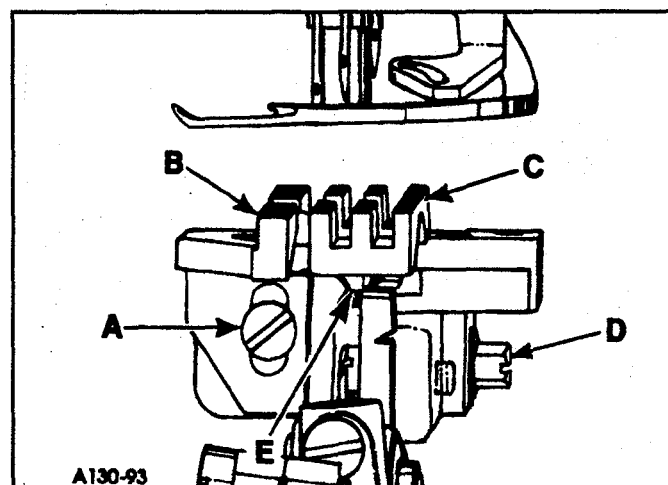


FIG. 11

## MAIN AND DIFFERENTIAL FEED DOGS (CONT.)

Loosen slotted nut (D), raise or lower so both feeds have the same amount of travel. With differential feed at extreme forward end of travel, feed dog should have 1/32" (.8mm) clearance from end of throat plate slot. Loosen screws (F) allowing differential feed bar (G) to be moved forward, rearward or turned so feed dog teeth are parallel to top of throat plate, across-the-line-of-feed. Retighten screws (F).

Turn handwheel in operating direction, check to ensure ample clearance between feed dogs and both ends of throat plate slots.

**NOTE:** Make sure that the feed crank link (E, Fig. 12) has adequate side shake to prevent a possible machine seizure.

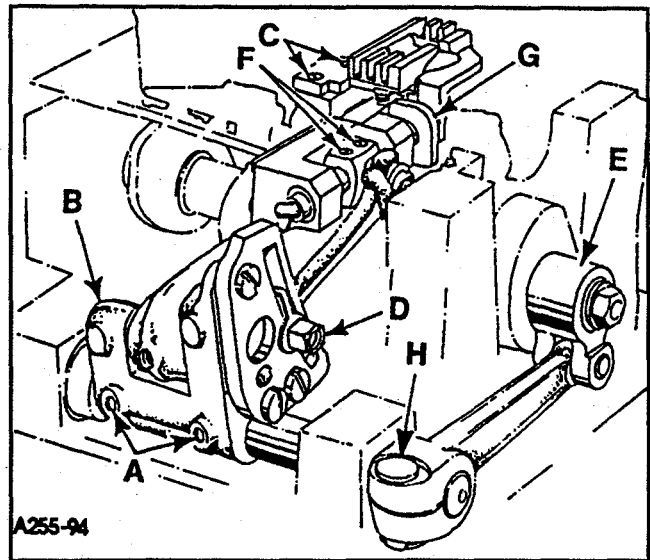


FIG. 12

### DIFFERENTIAL FEED RATIO

The differential feed ratio is set by loosening slotted nut (D, Fig. 12) and moving the slotted nut with attached driving link upward to achieve an increase in the amount of differential feed travel. Moving it downward decreases the feed travel and achieves reverse differential at the bottom of its travel.

This Series of machine has a stretching ratio of 3/4 to 1 up to a gathering ratio of 2 to 1, depending on the length of stitch set at the main feed dog. Turn machine by hand, making sure the differential feed dog clears the main feed at the back end of its stroke.

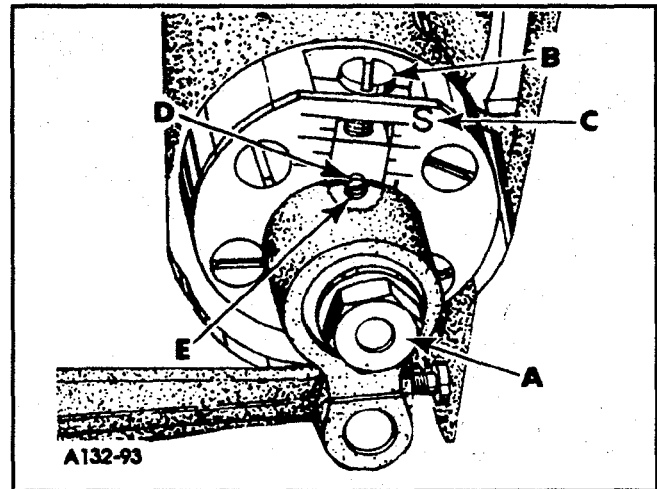


FIG. 13

### CHANGING STITCH LENGTH

Set the stitch to required length. This is accomplished by loosening locknut (A, Fig. 13) 1/2 turn (it has a left hand thread) on the end of the stitch regulating stud and turning stitch adjusting screw (B) located under the left end of the cloth plate, in the head of the main shaft (C), which is marked with "L" and "S". Turning the screw clockwise shortens the stitch (moves stitch regulating stud toward the "S") and turning it in a counterclockwise direction lengthens the stitch (moves stitch regulating stud toward the "L"). Retighten locknut securely.

To prevent destructive damage to the feed drive bearing, the Key screw (D) must engage the "U" shaped key slot in the ferrule (E). Torque nut (A, Fig. 13) to 55 in. lbs. (6.2 Nm).

**NOTE:** Any change in stitch length will necessitate a corresponding change in the rear needle guard setting.

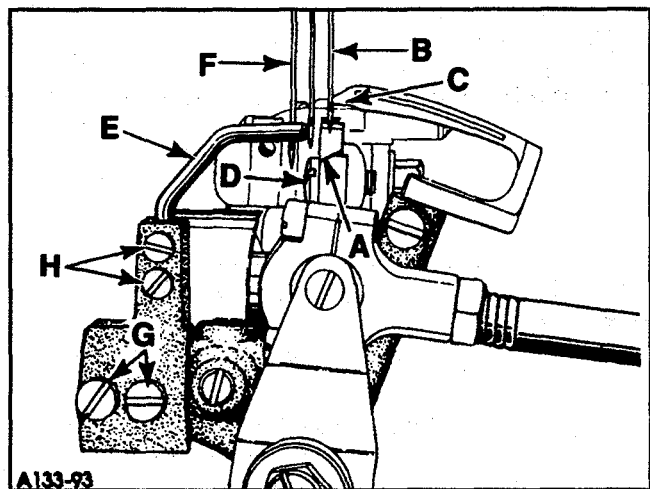


FIG. 14

## REAR NEEDLE GUARD

At extreme forward end of travel, rear needle guard (A, Fig. 14) must be set horizontally not to contact rear of right needle (B) with a maximum clearance of .005" (.13 mm). Guard should be set as low as possible, yet have its vertical face approach approximately 3/64" (1.2mm) above needle point until point of looper (C), moving to the left, is even with the needle. Adjustment can be made by loosening screw (D), reposition guard as required and retighten screw.

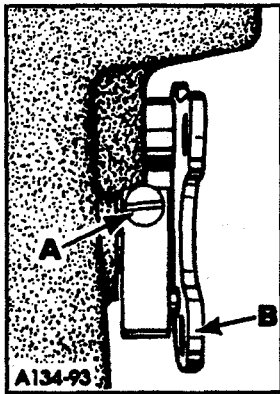


FIG. 15

## FRONT NEEDLE GUARD

Front needle guard (E, Fig. 14) should be set as low as possible, yet push the left needle (F) towards the path of looper (C) until point of looper passes to the rear and left side of needle. Looper may brush but not pick at the left needle. Front needle guard should not make contact with rear needle guard or right needle at any time. Forward or rearward adjustments can be made by loosening screws (G), reposition guard as required and retighten screws. Height or rotation of guard can be acquired by loosening screws (H), reposition as required and retighten screws.

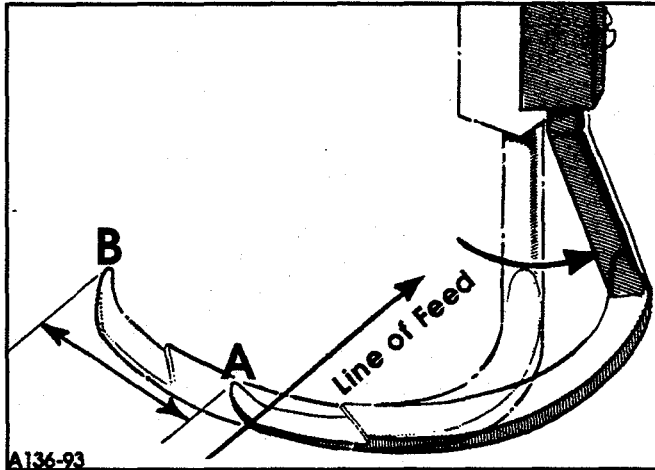


FIG. 16

**NOTE:** A change in stitch length WILL NOT require a change in front needle guard setting.

## THREAD TENSION RELEASE

The thread tension release is set correctly when it begins to function as the presser foot is raised to within 1/8" (3.2mm) of the end of its travel and is entirely released when the presser foot has reached its highest position.

If adjustment is needed, loosen tension release lever screw (A, Fig. 15), located at the back of the machine and move tension disc separator as required. Retighten screw. After adjustment there should be no binding at any point.

Gauge			Spreader Arc Travel	
* 064	1/4"	6.4mm	11/16"	17.5mm
* 056	7/32"	5.6mm	21/32"	16.7mm
* 048	3/16"	4.8mm	5/8"	15.9mm
040	5/32"	4.0mm	9/16"	14.3mm
032	1/8"	3.2mm	9/16"	14.3mm

\* Reduce by one gauge for knit material machines.

Table III

## SPREADER ADJUSTMENTS

Set the arc travel of the spreader point (A, Fig. 16) to point (B) as listed in Table III, by loosening nut

(E, Fig. 22) and moving the connecting link (F) up or down to the desired amount of arc travel. After making the travel adjustment and retightening nut (E), check to see that the arc of travel of link (F) is equal distance from the center of the spreader rocker shaft (G). Adjustment is made by loosening nut (H) and moving the spreader rocker shaft arm (J) to position the connecting link properly. Be sure to retighten nut (H).

With needle bar at top of its stroke and spreader at extreme left end of its travel, point of thread carrying notch (A, Fig. 17) should extend 7/32" (5.6mm) to the left of the centerline of left needle. Adjustment can be made by loosening screws (B), reposition spreader as required being sure to push down on spreader holder carrier (K, Fig. 22) and up on spreader holder (L) while tightening screws (B, Fig. 17) because spreader holder (C) acts as lower thrust collar for spreader holder carrier.

## SPREADER ADJUSTMENTS (CONT.)

Bottom surface of spreader should be set  $21/64"$  (8.3mm) from top of throat plate (See Fig. 17). At extreme right end of travel, spreader must be set to clear the shank of left needle by  $1/64"$  to  $1/32"$  (.4mm to .8mm). Adjustments can be made by loosening screws (D), reposition spreader as required and retighten screws. A TT-68 gauge can be used to set the  $21/64"$  (8.3mm) dimension.

**NOTE:** It may be necessary to coordinate these adjustment to attain specified dimensions.

Stationary thread guide (E, Fig. 17) should be set to clear right needle by approximately  $3/32"$  (2.4mm). Attaching screws (F) will allow repositioning as required. Moveable thread eyelet (G) should be positioned with its eye directly over the front end of slot in stationary thread guide (E). With needle bar at bottom of stroke, lower surface of thread eyelet (G) and top of thread guide (E) should have the clearance equivalent to the shank of a Type 121 needle, approximately  $.080"$  (2mm). Screw (H) will allow repositioning as required.

Timing of spreader travel is determined by the position of spreader drive eccentric (A, Fig. 18) on the crankshaft. While rotating handwheel in operating direction, the spreader should begin to move to the left as needle bar rises  $1/8"$  (3.8mm) from bottom of stroke. Adjustment can be made by loosening screws (B), advance or retard eccentric as required. Thrust eccentric against spacing washer (C) when tightening screws (B).

**NOTE:** Thread machine as indicated in Fig. 3.

## THREAD TENSION

Set the thread tension (B, Fig. 3) so the needle threads produce uniform stitches on the undersurface of the fabric. The tension applied to the lower looper thread (H) should be very slight and just sufficient to steady the thread. Turning the tension knobs (B) clockwise increases the tension, turning counterclockwise decreases the tension.

The tension applied to the spreader thread tension assembly (D) to the left of the spreader pull-off eyelet (K) should be one half as strong as the tension applied on the main spreader tension assembly (L) on the right of the machine.

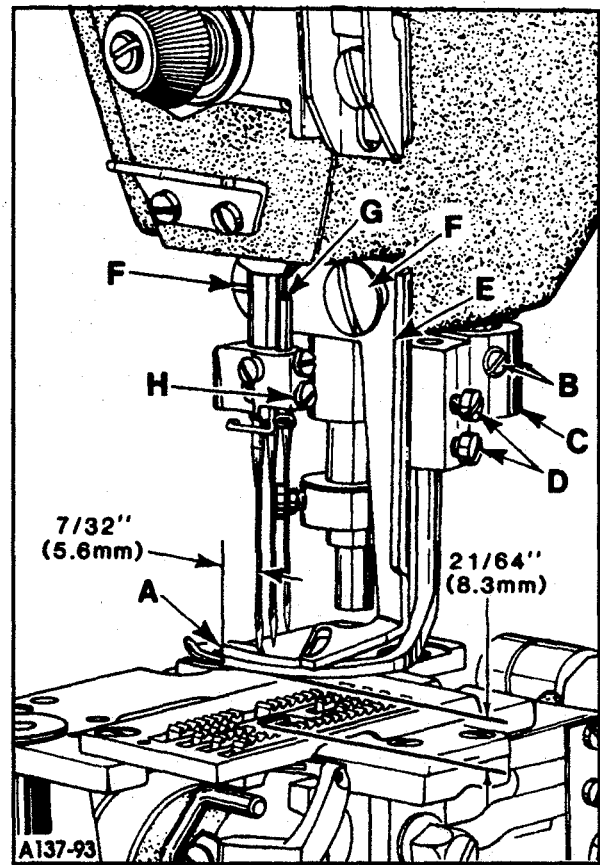


FIG. 17

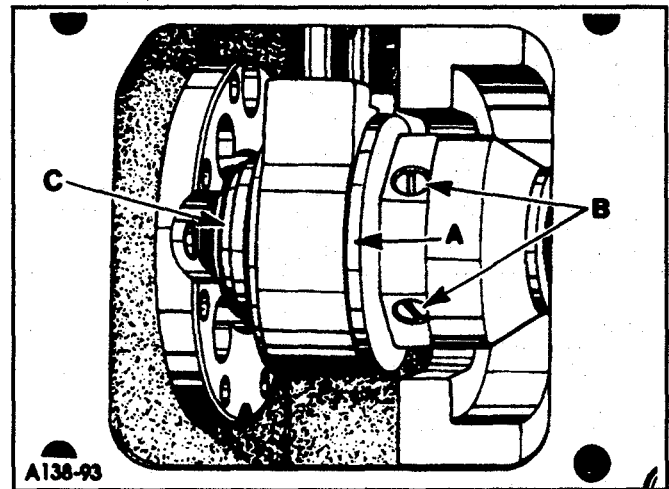


FIG. 18

## METERING DEVICE (CONT.)

4. JOG REVERSE (D)  
enables the elastic to feed through the metering device in a reverse direction.
5. TENSION ADJUST WHEELS (E)  
three wheels each is numbered 0 to 9. Setting 000 allows the least amount of tension while setting 999 allows the greatest amount of tension. For initial setting, set the wheels to 080. For less elastic increase the number, for more elastic decrease the number.

## JUMPER ADJUSTMENTS

**NOTE:** The control box has been preset at the factory to rotate the metering device in the proper direction.

If the rotation of the metering device is incorrect turn off power supply (A, Fig. 24) and remove control box front cover. Reverse the jumper JU1 (A, Fig. 25).

The jumper plug will cover the top and middle pins allowing forward direction or the bottom and middle pins allowing reverse direction.

## POTENTIOMETER ADJUSTMENTS

**NOTE:** The two stepper motor current potentiometers have been preset at the factory and should not need adjustment.

**CAUTION:** The control box has a 220V capacity. It is advisable when making any adjustments to the potentiometer that the main power (A, Fig. 24) is turned OFF.

Covers should be replaced before running the machine. If further adjustment is required repeat steps 1. and 2.

1. The stepping motor current (while stepping) can be adjusted at potentiometer number R20 (A, Fig. 26) on the driver box. Turn clockwise to increase the current. Use minimal current to increase the life of the motor.
2. The stepping motor current (while at rest) can be adjusted at potentiometer number R21 (B) on the driver box. Turn clockwise to increase the current. Too much current may overheat the motor at rest.

## UNDER TRIMMER

The lower knife (A, Fig. 27) should be set with cutting edge flush with throat plate surface, at approximately a one degree shear angle (See Fig. 28). Adjustment can be made by loosening hexagonal head screw (B, Fig. 27) permitting lower knife to be moved up or down; loosening

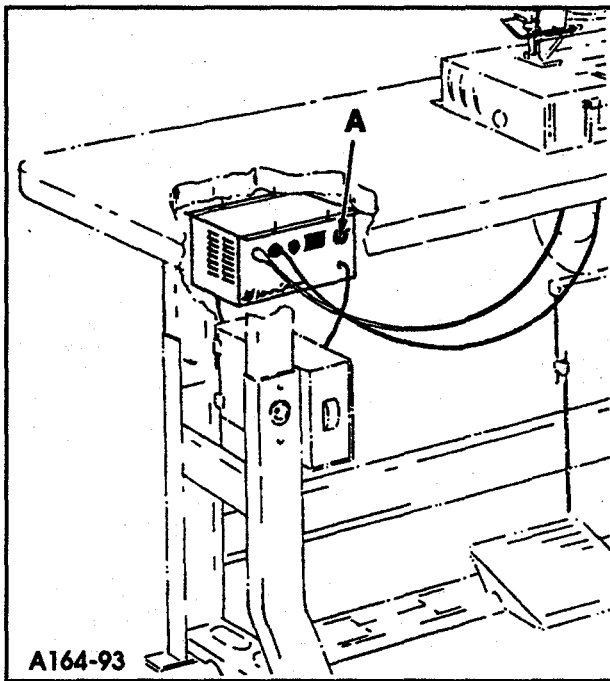


FIG. 24

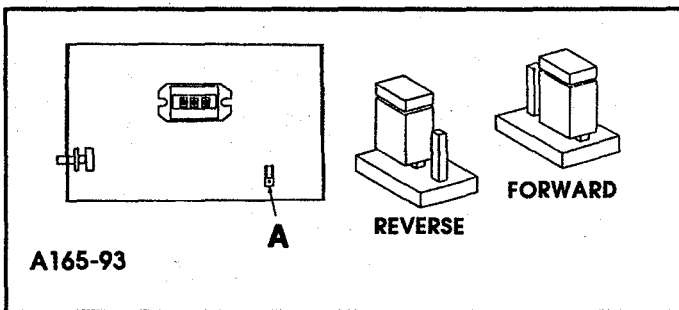


FIG. 25

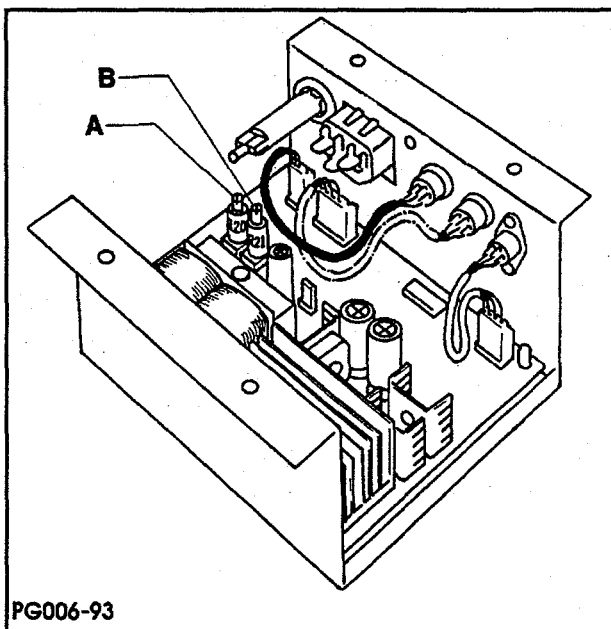


FIG. 26

## UNDER TRIMMER (CONT.)

screws (C) will allow positioning of lower knife block (D) to obtain the proper shear angle. Never loosen screw (E) for adjusting purposes, it should remain tight at all times. After adjustments are made, tighten screws (B and C) securely. The upper knife (F) should be set to align its cutting edge with the centerline of right needle to engage lower knife for full cutting length. This can be accomplished by loosening screw (G) permitting upper knife to be moved forward or rearward; loosen screws (H and J) and turn eccentric (K) as required to obtain proper positioning for up and down movements. Retighten screws securely.

Lower knife is spring pressed against upper knife. Pressure can be increased or decreased by adjusting stud (L) which is locked by nut (M). Lower knife may be secured in any position by tightening screw (N) and locking nut

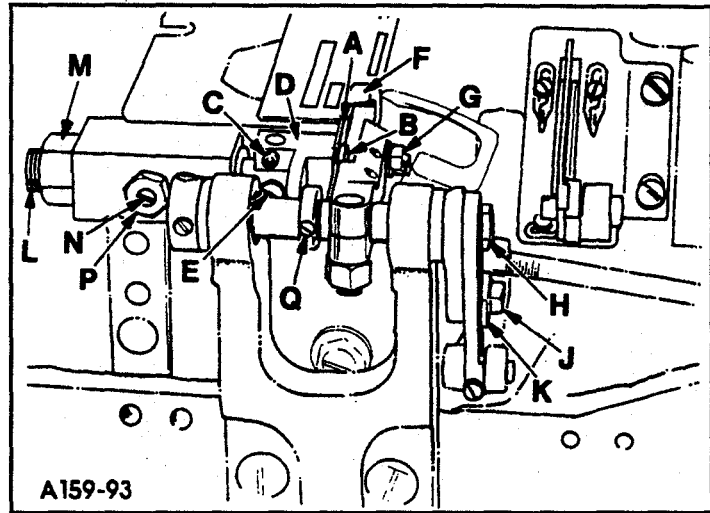


FIG. 27

## SPECIAL INSTRUCTIONS

### NEEDLE LEVER

When adjusting needle lever or replacing related parts, follow instructions in sequence as listed:

Install "O" rings (A, Fig 29) onto needle lever stud (B) and thrust collar (C).

With needle lever (D) in machine and positioned properly; insert stud (B) through hole in needle lever until its shoulder contacts the needle lever and the word "UP" on stud is in the upright position. While making sure no binding exists in the needle bar link, secure stud (B) with the front set screw in top of machine bed.

Install thrust collar (C) onto stud (B) being careful not to damage "O" ring.

Compress components together by tightening screw (E) until washer (F) bottoms against stud (B). Loosen front set screw securing stud (B). Position needle lever assembly front to back so that needle bar moves freely through top and bottom needle bar bushings.

Secure front and rear screws against stud (B).

To check temper load ring for proper compression, remove screw (E) from stud (B) and loosen rear set screw in top of bed. Thrust collar (C) should spring out .003" - .007" (.08mm - .18mm). Compress load ring in reverse order, then tighten rear set screw.

With indented "UP" on stud (B) in upright position install bearing oiler (G) so its hook sets in oil supply hole (H) of stud. When hook and stud are secured in their proper positions, the proper amount of oil will be channeled to stud for lubricating needle lever (D).

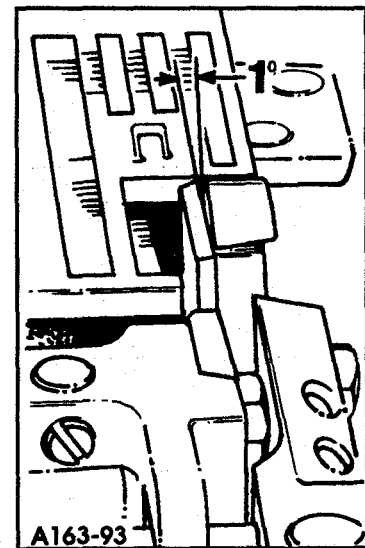


FIG. 28

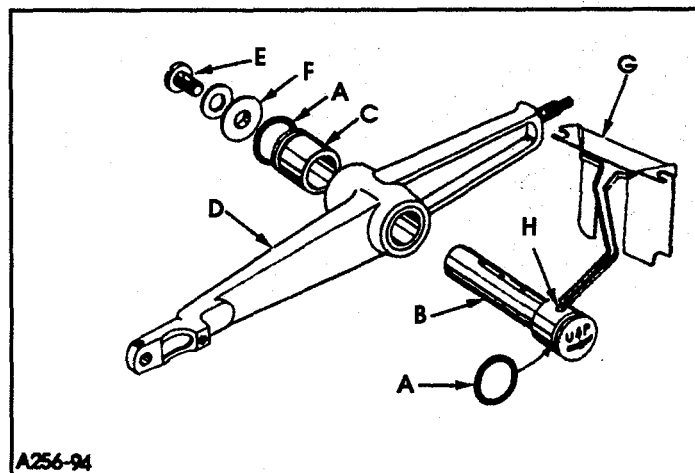


FIG. 29

## ALIGNMENT MAIN SHAFT TO CRANKSHAFT

As viewed looking down from rear of machine, spot screws (A, Fig. 30) in the couplings must align with the spots in the looper drive crank (B) and set screws (C) must align with the flats on crankshaft (D) and MAIN SHAFT (E). Main shaft must be positioned laterally with .045" (1.14mm) clearance between the right side of its head and the bed casting as shown in (Fig. 31).

Looper drive crank (B, Fig. 30) must be positioned laterally with 1/32" (.8mm) clearance between it and main shaft (E) as shown in (Fig. 29). Once these settings are made, it is very important that the couplings are tightened in the following sequence for best performance.

Snug spot screws (A) temporarily, to the looper drive crank. Snug set screws (C) temporarily, to the crankshaft and main shaft. Torque screws (F) to 19 - 21 in. lbs. (2.15-2.37Nm). Loosen spot screws (A) and set screws (C). Re-torque screws (F) to 19-21 in. lbs. (2.15-2.37Nm), then, torque screws (A and C) to 19-21 in. lbs. (2.15-2.37Nm).

The oil drip plate (A, Fig. 32) located in the oil reservoir should be positioned with its tip in the recessed cut out in the bed casting, as far to the left as possible without touching. It has elongated mounting holes and can be adjusted by loosening screws (B) in top of the oil reservoir back cover to position as required, retighten screws.

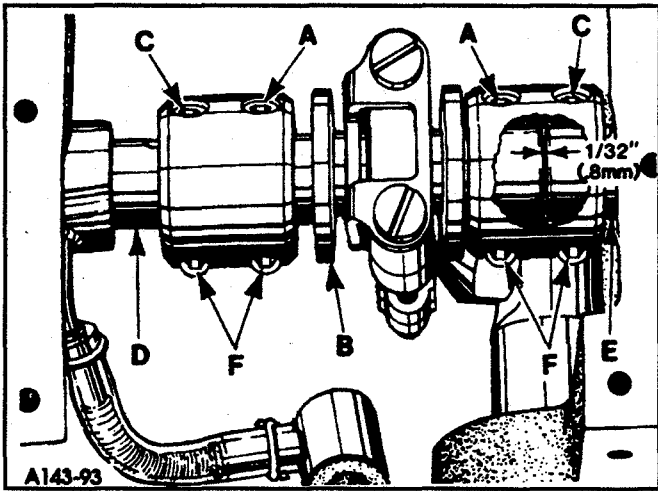


FIG. 30

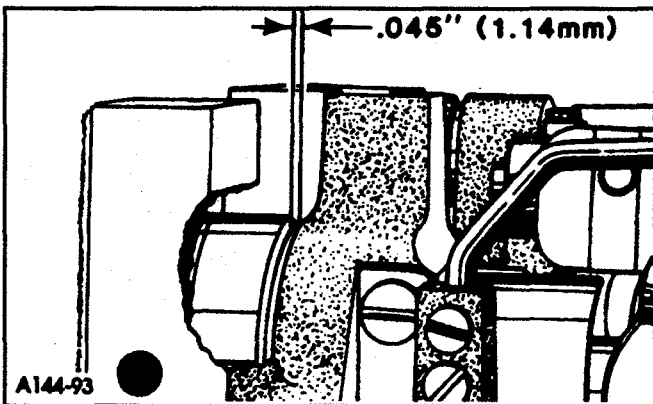


FIG. 31

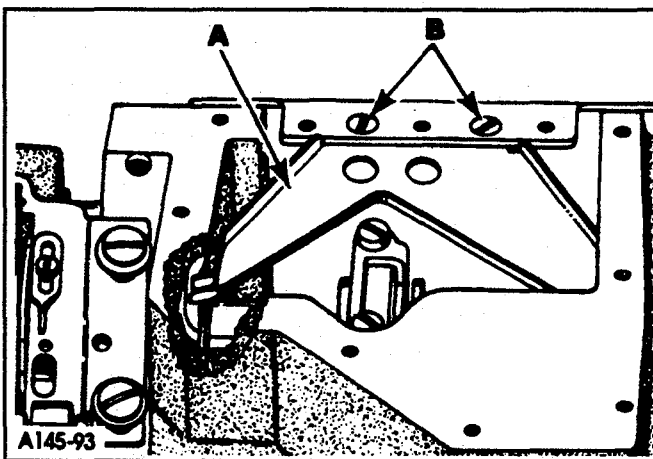


FIG. 32



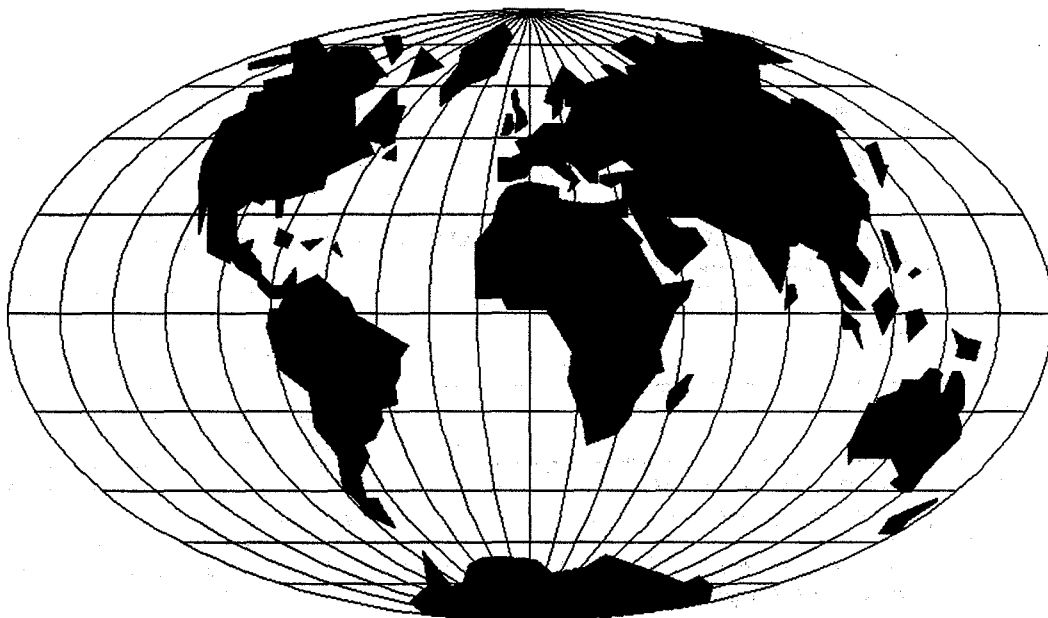
### TROUBLE SHOOTING SKIPPED STITCHES

Before the machine left the factory it was adjusted and inspected to give you the utmost satisfaction and durability at all times. If however, the machine has been readjusted and it is not sewing properly, see (Table IV) for suggestions which may prove beneficial to you.

Malfunction	Causes	Cures
Right needle loop too small	Take-up wire set to low	Raise take-up wire slightly
	Needle thread pinched by rear needle guard, and collapsing needle loop	Lower right needle guard slightly *
Left needle loop too small	Needle thread pinched by front needle guard, and loop pulled back thru needle	Lower front needle guard slightly *
All needle loops too small	Needles do not rise enough to form needle loop properly	Readjust needle bar height if necessary
Thread twisting around right needle	Large needle loop	Lower take-up wire for the right needle slightly, or increase thread tension
Thread twisting around left needle	Front needle guard pinching needle thread pushing thread thru needle eye	Lower front needle guard slightly, or increase thread tension *
Looper misses both needle loops as presser foot is coming off a seam	Fabric is not held down in front of the cross seam and is flagging	See if presser bar of presser foot is sticking *
Looper misses right needle loop when operator is trying to match seams or ends of garments	Needle deflected toward operator who may be holding back on fabric while matching seams or ends of garment	Do not hold back excessively on fabric
Both needle loops formed properly but brushed out of the way of the looper	Needle bar set too high	Lower needle bar slightly *
Needles miss triangle on looper thread side	Looper thread too loose, and not making a good triangle	Increase looper thread tension
	The operator pulls back on fabric, or needles glance off when coming on a seam	Do not pull fabric at the back. Check needles for burr
Spreader thread skips	Spreader pickup point out of position to pick up spreader thread	Check spreader travel dimension. Reset if necessary.*
		Check left of needle 7/32" (5.6mm) dimension. Reset if necessary. *
		Spreader point should be positioned to the right of the stationary thread guide so the spreader thread can be picked up by the spreader pick up point. Reset stationary guide if necessary.*
		Spreader thread eyelet on needle head should be set to insure that the spreader thread travels from front to rear in stationary guide angled slot. Reset if necessary.*

\* NOTE: Cures marked with an asterisk have to be accomplished only by trained technicians or special skilled personnel under consideration of the instructions for mechanics and of the safety rules.

Table IV



## WORLDWIDE SALES AND SERVICE

Union Special Corporation maintains sales and service facilities throughout the world. These offices will aid you in the selection of the right sewing equipment for your particular operation. Union Special Corporation representatives and service technicians are factory trained and are able to serve your needs promptly and efficiently. Whatever your location, there is a qualified representative to serve you.

It is important to remember that LEWIS® machines are also products of Union Special Corporation, thus offering the Finest Quality sewing machines.

---

**Corporate Offices:**

One Union Special Plaza  
Huntley, IL 60142  
(708) 669-5101

Brussels, Belgium  
Commerce, CA  
Leicester, England  
Miami, FL  
Paris, France  
Norcross, GA  
Möglingen, Germany  
Huntley, IL  
Milan, Italy  
Osaka, Japan  
Hong Kong  
Charlotte, N.C.  
Warminster, PA  
Montreal, Quebec  
El Paso, TX  
Mission, TX

Other Representatives throughout all parts  
of the world.



*Union Special*  
INDUSTRIAL SEWING EQUIPMENT