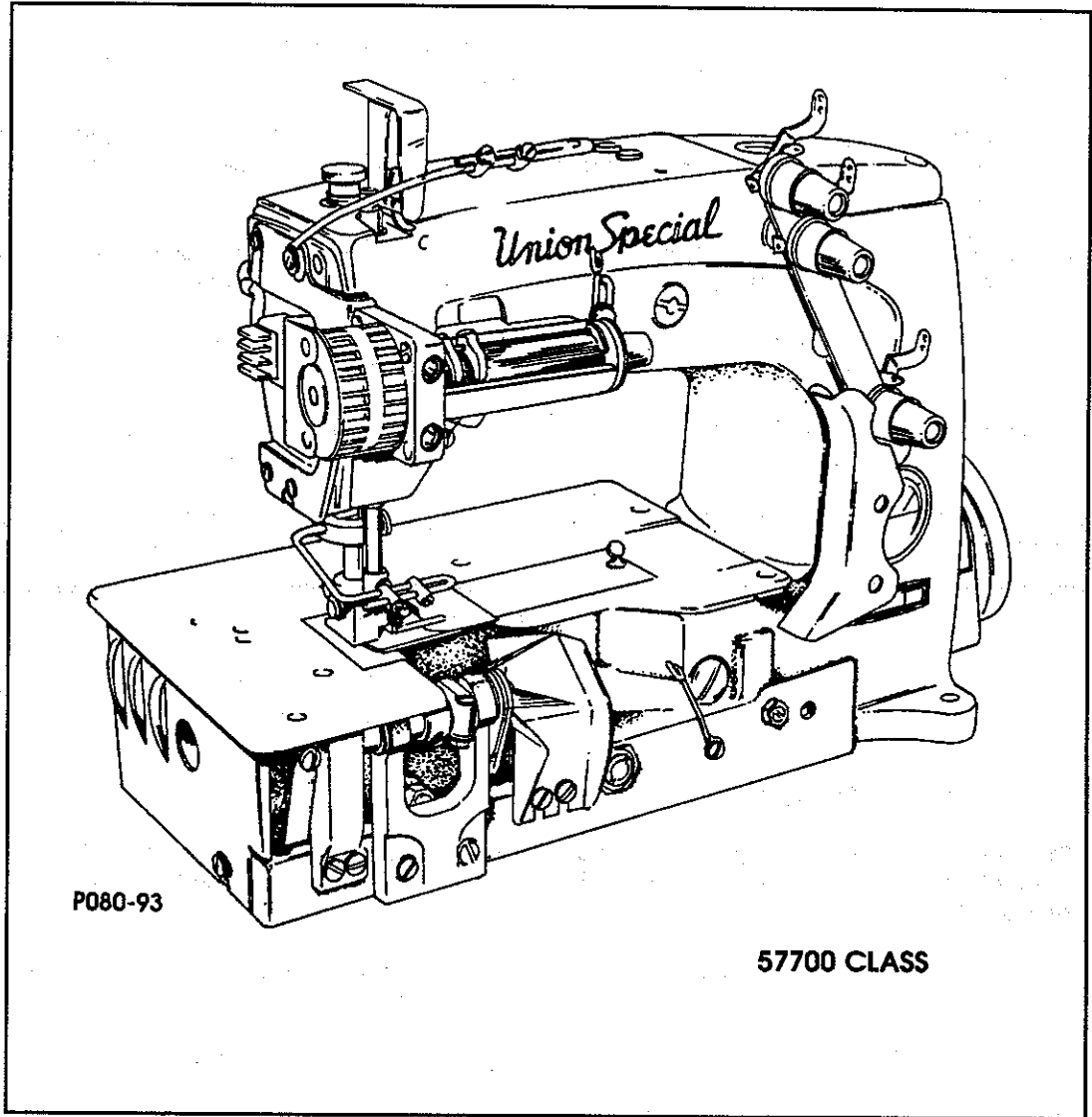


MANUAL NO.  
INS9308

ADJUSTING INSTRUCTIONS

STYLES

57700CER8  
57700CER12



*Union Special*  
INDUSTRIAL SEWING EQUIPMENT

# Manual No. INS9308 Adjusting Instructions for Styles 57700CER8 57700CER12

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By

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Draft 2

## PREFACE

This adjusting manual has been prepared to guide you while adjusting the 57700 Series machines. It can be used in conjunction with Union Special Illustrated Parts Manual PRT9307.

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 57700 Series machines.

## SAFETY RULES



### General Operating Directions

The sewing machines described in this manual are prohibited 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 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 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. The operation without the appertaining safety devices is not allowed.
5. All safety devices are components of the sewing machines: Fingerguard, needle lever eyelet guard, needle bar guard, needle break protection shield, 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 for 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 tools 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 works (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 electricians 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), it 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.

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## IDENTIFICATION OF MACHINE

Each Union Special machine is identified by a Style number which is on the name plate on the machine.

## STYLE OF MACHINE

Advanced high speed, two needles abreast, one looper, flat bed medium throw machine, needle bearing needle bar drive, light weight presser bar and needle bar driving mechanism, single reservoir, enclosed positive automatic lubricating system, filtered oil, return pumps for head/base. Lateral looper travel, double disc take-up, large handwheel and improved belt guard. Prepared for use with knee press for presser foot lifter, equipped with disc thread tensions, maximum work space right of needle bar 8 1/4" (209.55mm).

**57700CER** Two needle plain feed machine, equipped with a stepper motor driven upper metering device and fabric undertrimmer, for attaching elastic in long lengths, 1/4" to 1 1/2" (6.35mm to 38.10mm) wide, to rayon, silk, cotton, nylon and wool, flat and ribbed knit garments and for similar operations on light to medium weight materials. Standard 8 & 12 gauge. Seam specification 406-LSa-1. Type 121 GBS needle. Maximum recommended speed 5500 R.P.M..

## THREADING AND OILING DIAGRAM

The oil has been drained from the machine before shipping and the reservoir must be filled before starting to operate. Maintain oil level in "OPERATE" zone; add oil when the needle on the gauge registers on the black line marked "LOW". The machine is automatically lubricated and no oiling other than keeping the main reservoir filled is necessary. Refer to instructions under "LUBRICATION" and "CHANGING LENGTH" for additional instructions.

Threading is illustrated in Fig 1 for all styles.

INSERT THREADING INFO FOR FIG. 1

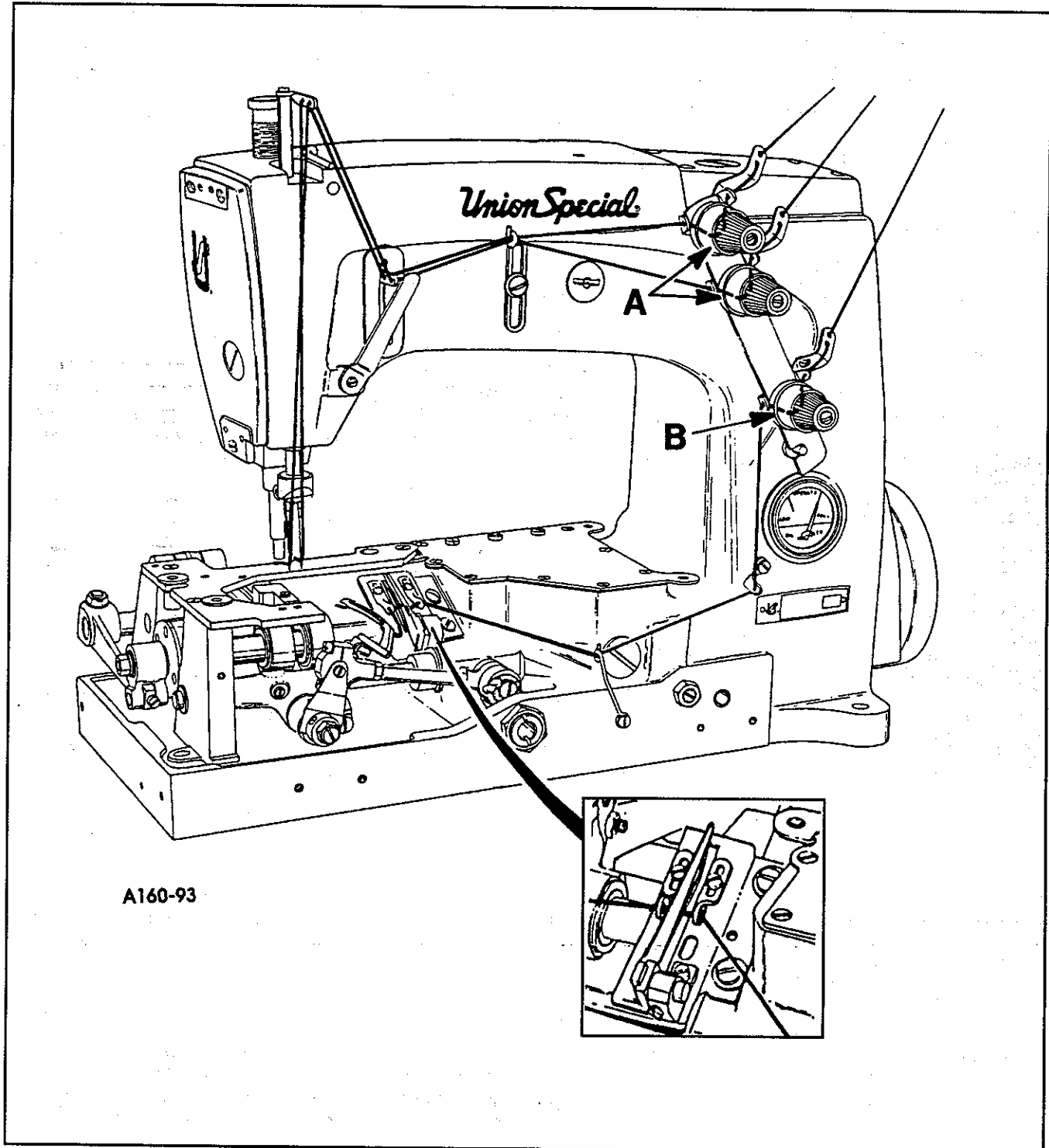


FIG. 1

## OIL GAUGE CALIBRATION

To recalibrate the oil gauge, follow instructions in sequence as listed:

- Place machine upright on a level surface.
- Remove plug screw (C, Fig. 2) to drain all oil from reservoir.
- Remove lower crank chamber cover on back of machine.
- Fill reservoir until oil is even with bottom of knee press shaft bushing (D).
- Loosen locknut (E) and rotate calibrating screw (F) as required until gauge needle registers on the black line marked "LOW".
- Tighten locknut (E), then replace plug screw (C) and lower crank chamber cover.
- Fill machine with oil until gauge needle registers on black line marked "FULL".

## LUBRICATION

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

Before operating, fill machine with oil at plug screw (A, Fig. 2). While filling machine with oil, check gauge (B). When proper oil level is reached, gauge needle will register on black line marked "FULL". Oil must be added when gauge needle registers on black line marked "LOW". Although the machine can be operated safely when gauge needle registers in the "OPERATE" zone, it is recommended to always check oil level before operating to be sure machine is filled with oil to the "FULL" mark. **CAUTION: DO NOT** over fill machine.

To drain oil, remove plug screw (C), on lower right end of machine below the handwheel. Oil must be changed every 2000 operating hours to minimize wear.

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. 3) and needle bar (B). Replace head cover and fill machine with oil to proper level. Run machine at between 200 and 500 RPM to ensure proper lubrication of components preventing any damage which may occur from lack of oil distribution.

## 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 covered by this adjusting manual is Type 121 GBS, Size 075/029. See Table I for description and sizes available.

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

Table I

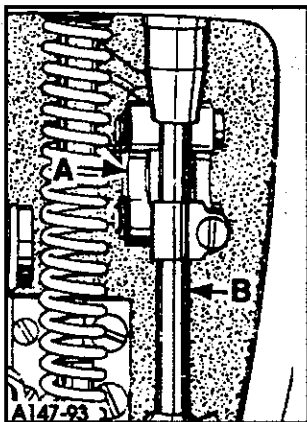
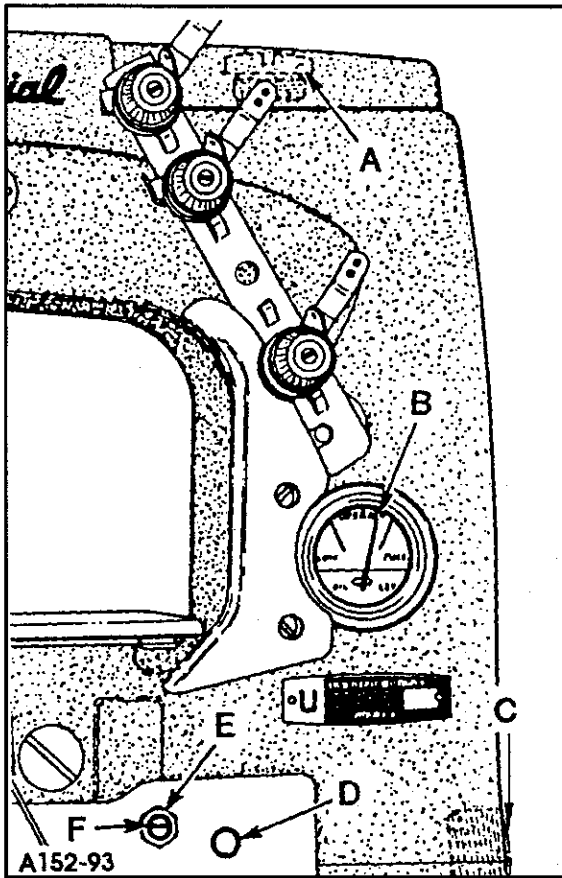


FIG. 3

## 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.

### 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, re-tighten 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.

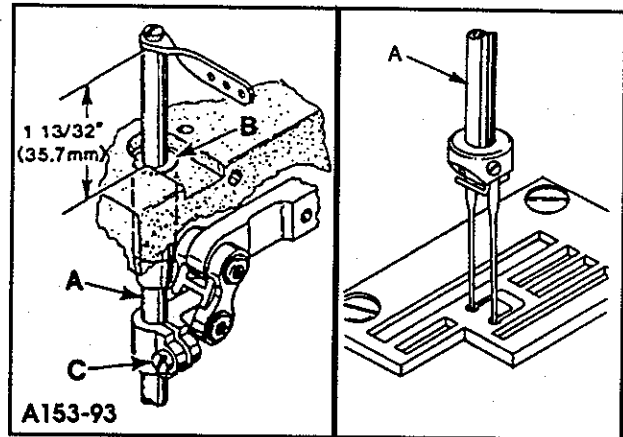


FIG. 4

### 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.

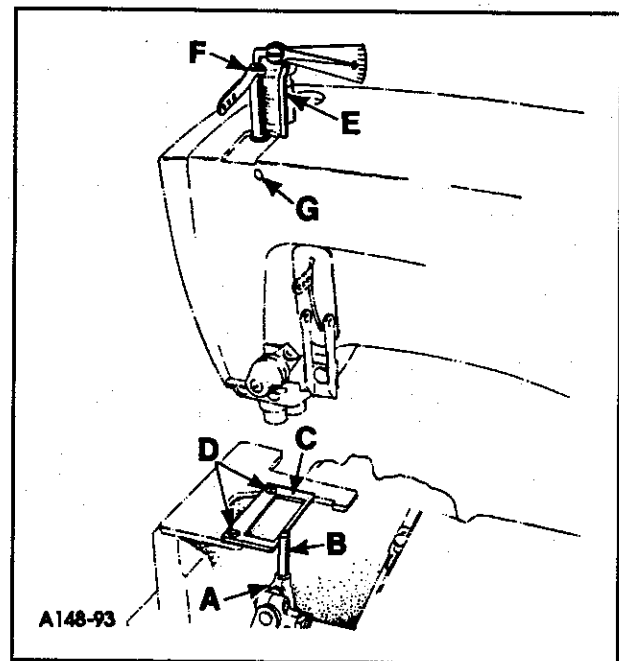


FIG. 5

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 but in front of the 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.

## SYNCHRONIZING LOOPER AND NEEDLE MOTIONS (CONT.)

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

Loosen screw (C, Fig. 6) in looper drive lever (D). A rod of .146-40 thd. or Union Special Screw No. 22870 A can be threaded into the looper drive lever rocker shaft through the center of thrust adjusting screw (E). Tap or pull slightly as required to position shaft for proper synchronization. Tighten screw (C) securely and remove rod or screw used to position shaft.

With looper at extreme right end of travel, check location of the right looper connecting rod bearing (A, Fig. 8) using gauge No. 21227 DC (B). Place hole in gauge over threaded stud and the left inside edge of the gauge should locate against the left side of the looper rocker cone (C). If adjustment is necessary, loosen clamp screw (D) and reposition looper drive lever (E) as required, then retighten clamp screw (C).

## LOOPER SETTINGS

Insert a new set of needles 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).

**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.

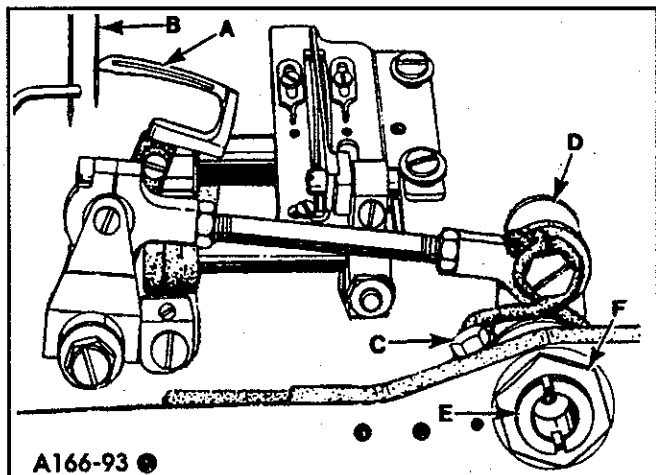


FIG. 6

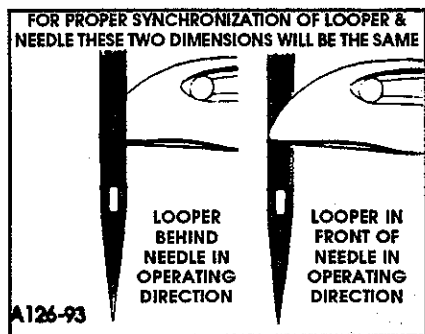


FIG. 7

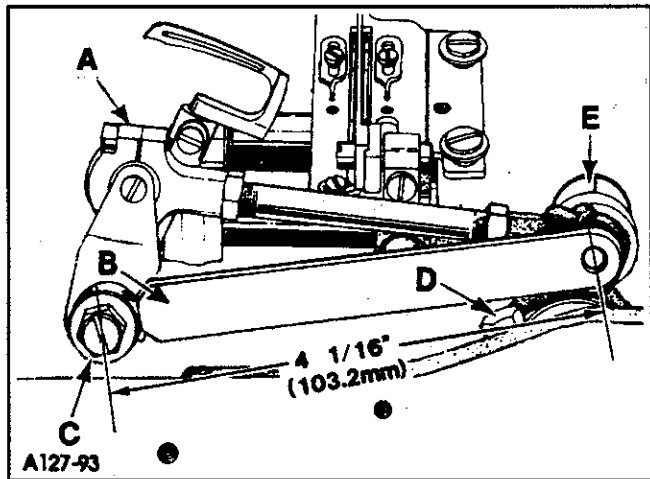


FIG. 8

Machine Style	Dimension (A, Fig. 9)	Available Looper Gauge No.
8 (032) and *12 (048) Gauge Styles	7/32" (5.6mm)	21225-7/32
*Reduce by one gauge for knit material machines		

Table II



## NEEDLE BAR HEIGHT

Turn handwheel in operating direction until point of looper is flush with the left side of left needle. Final setting is  $\frac{3}{64}$ " (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. Re-tighten screw (C) and check to ensure that the needles center in needle holes of throat plate.

## FEED DOGS SETTINGS

Feed dog (A, Fig. 11) should be centered in throat plate (B) with equal clearance on all sides and ends with feed travel set to desired stitch length. At highest point of travel, tips of feed dog teeth should extend the depth of one full tooth, above throat plate and parallel to same. Loosen screw (D), which secures feed dog in position, and adjust screw (C) up or down to support feed dog. Retighten screw (D).

Parallel adjustment can be made by loosening nut (A, Fig. 12) and turn screw (B) clockwise to lower front of feed dog, counterclockwise acts the reverse. When properly set, retighten nut (A).

Right to left adjustment can be made by loosening screws (A, Fig. 13) and slightly move feed rocker (B) on feed rocker shaft (C) as required, then retighten screws. Check to ensure that feed rocker arm (D) does not bind after adjustment.

Forward or rearward centering of the feed dog can be accomplished by loosening nut (E, Fig. 13). Move feed rocker (B) as required and retighten nut.

**CAUTION:** Feed crank link sub-assembly (G, Fig. 13) **MUST** have shake with **NO** binds at a 360° rotation of the handwheel. Nut (F) should be torqued at 55 in. lbs. (63 cm/kg).

## CHANGING STITCH LENGTH

Set the stitch to required length. This is accomplished by loosening locknut (A, Fig. 14) 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"). Re-tighten 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. 14) to 55 in. lbs. (6.2 Nm).

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

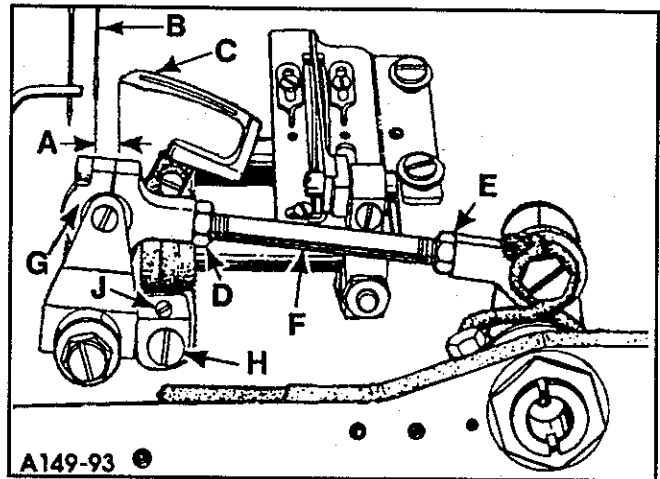


FIG. 9

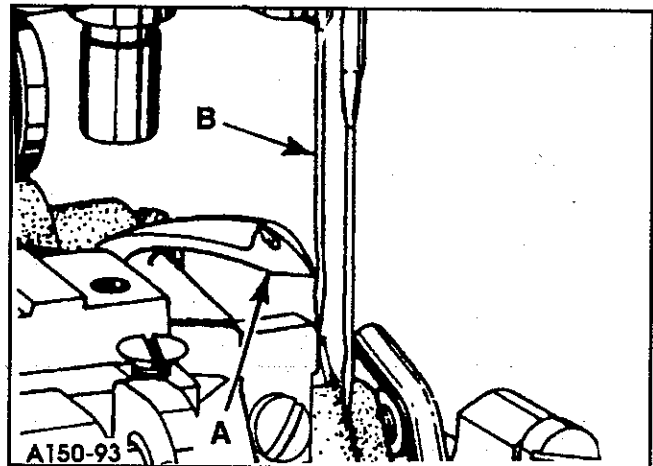


FIG. 10

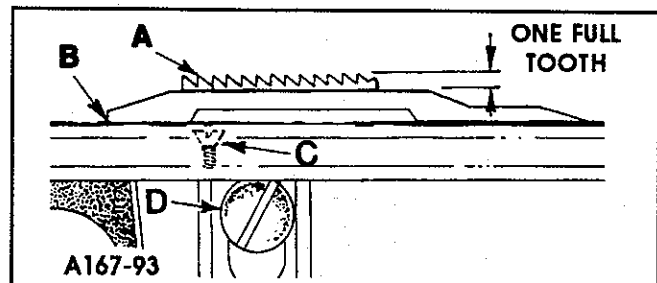


FIG. 11

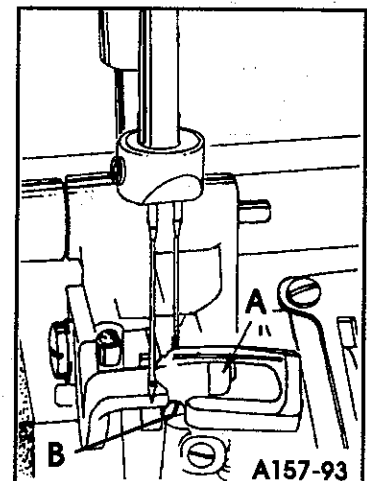


FIG. 12

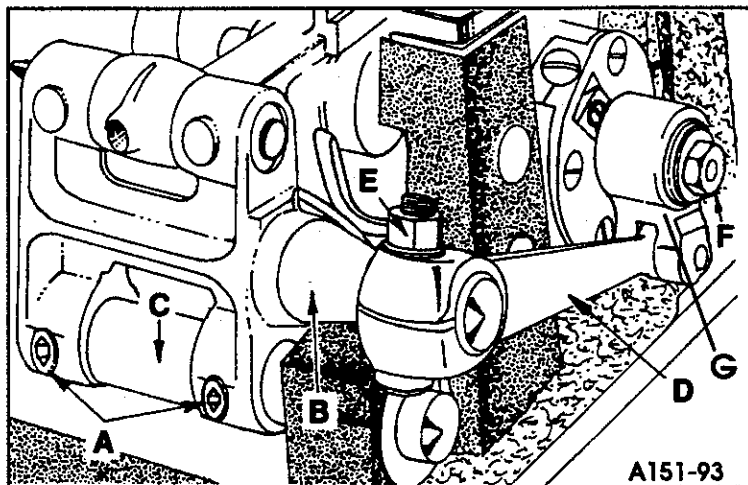


FIG. 13

## REAR NEEDLE GUARD

Set the rear needle guard (A, Fig. 15) height so that when the looper point (C) is even with the right side of the right needle (B), the tip of the needle is approximately  $\frac{3}{64}$ " (1.2mm) below the top of the guarding surface. Set the guard (A) front to back to touch but not deflect the right needle (B). Adjustment can be made by loosening screw (D), reposition guard as required and re-tighten screw.

NOTE: At loop taking time, the left needle (F) WILL NOT be guarded by the rear needle guard (A).

## FRONT NEEDLE GUARD

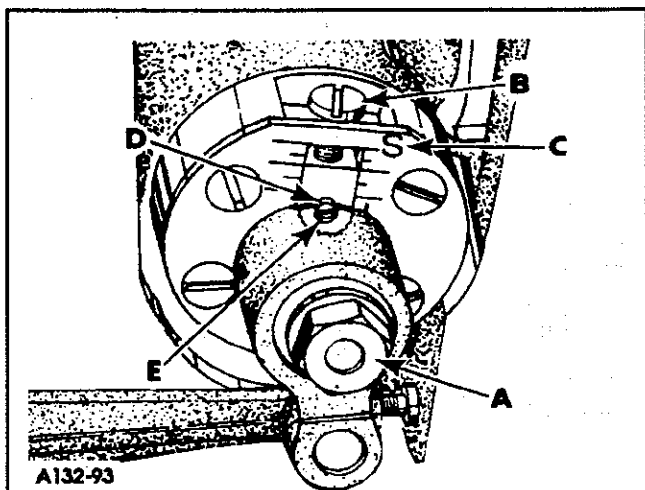


FIG. 14

Front needle guard (E, Fig. 15) must deflect the left needle (F) towards the path of the looper (C) as it moves behind the needle. The looper (C) must not touch the needle (F) at loop taking time, a maximum clearance of 0.002" (0.05mm) is permissible. Forward or rearward adjustments can be made by loosening screws (G), reposition guard as required and re-tighten screws. Height or rotation of guard should be  $\frac{1}{3}$  up from the tip of the needle, this can be acquired by loosening screws (H), reposition as required and re-tighten screws.

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  $\frac{1}{8}$ " (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. 16), located at the back of the machine and move tension disc separator as required. Re-tighten screw. After adjustment there should be no binding at any point.

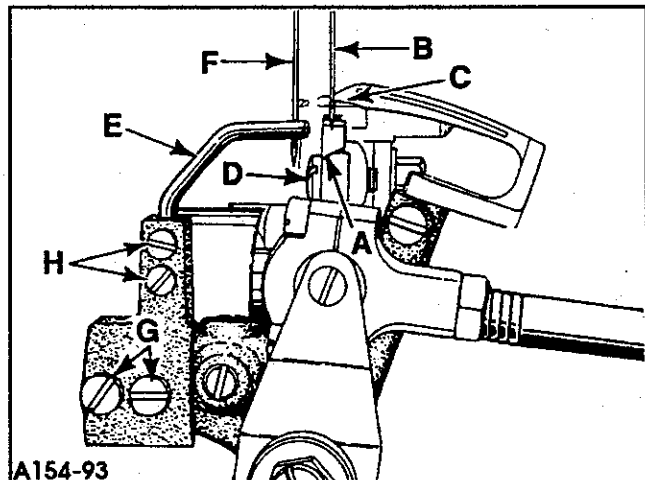


FIG. 15

## PRESSER FOOT AND PRESSER BAR SETTING

The presser foot is set correctly when it is centered with the needle; there is  $\frac{1}{32}$ " (0.8mm) in between the underside of the presser bar guide and bottom of opening in head. Height of presser bar (A, Fig. 17) is correct when presser foot can be removed by depressing foot lifter lever (B, Fig. 16). There should be approximately  $\frac{1}{32}$ " (.8mm) clearance between lower surface of presser bar connection and guide (B, Fig. 17) and bottom surface of head opening in bed casting when foot lifter lever is released and presser foot lying flat on throat plate with feed dog below throat plate.

## PRESSER BAR SETTING (CONT.)

Adjustment can be made by turning handwheel to position needle bar at bottom of stroke. Loosen screw (C, Fig. 17) and while holding presser foot down on throat plate, position presser bar connection and guide as required to attain specified clearance and re-tighten screw.

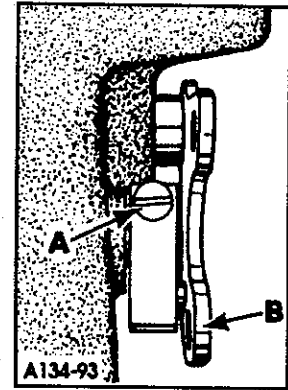


FIG. 16

## METERING DEVICE

### Function Switches

1. **POWER ON LIGHT (A, Fig 18)**  
is lit when the main power switch is in the on position.
2. **JOG SPEED ADJUSTMENT POTENTIOMETER (B)**  
is used to increase or decrease jog speed.
3. **JOG FORWARD (C)**  
enables the elastic to feed through the metering device in a forward direction.
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.

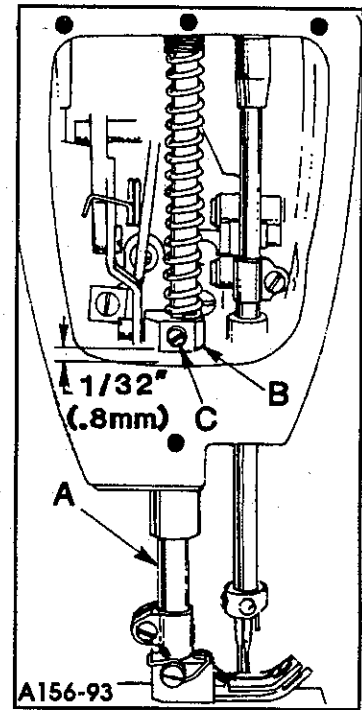


FIG. 17

## 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. 19) and remove control box front cover. Reverse the jumper JU1 (A, Fig. 20).

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

## DRIVE BOX POTENTIOMETER ADJUSTMENTS

The stepper motor current potentiometers have been preset at the factory and generally do not need adjustment. If adjustment is required the following steps should be taken.

1. Turn off the main power (A, Fig. 19), the control box has a 220 volt capacity, shock could occur.
2. Remove cover from drive box.
3. Potentiometer R20 (A Fig. 21) controls the stepping motor current while stepping. If the elastic is not consistent throughout the speed cycle (slow speed to high speed) the current should be increased by turning Potentiometer R20 (A) clockwise, generally in 1/8 turn increments, until the desired look is obtained.

**NOTE:** Using minimal current will increase the life of the motor.

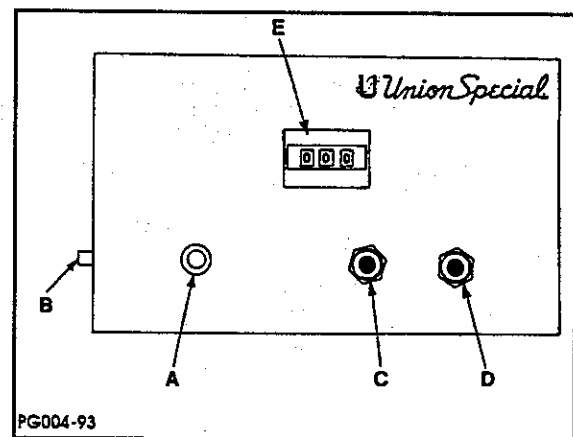


FIG. 18

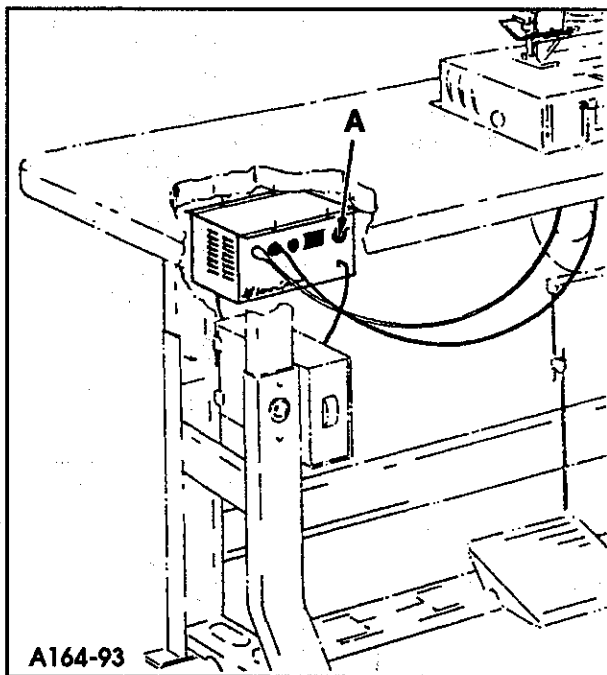


FIG. 19

#### DRIVE BOX POTENTIOMETER ADJUSTMENTS (CONT.)

- Potentiometer R21 (B, Fig. 21) controls the stepping motor current while at rest and should not allow the elastic to be pulled back through the rollers before the next garment is started. If the elastic pulls back through the rollers when the stepping motor is at rest the current should be increased by turning Potentiometer R21 (B) clockwise, generally in 1/8 turn increments, until the desired holding of the elastic is obtained.

NOTE: Too much current at rest may overheat the motor and cause failure.

- Replace all covers.

CAUTION: After any of the potentiometer adjustments are made the covers should be replaced before turning on the power.

#### UNDER TRIMMER

The lower knife (A, Fig. 22) should be set with cutting edge flush with throat plate surface, at approximately a one degree shear angle Fig. 23. Adjustment can be made by loosening hexagonal head screw (B, Fig. 22) permitting lower knife to be moved up or down; loosening two 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 (P) against support bracket.

With upper knife in up position, set and lock collar (Q) so it barely contacts lower knife block (D).

Set the lower chip chute to clear looper connecting rod and cast-off support plate. Set the upper chip chute to clear the lower chip chute at bottom of stroke and tight against the right side of upper knife.

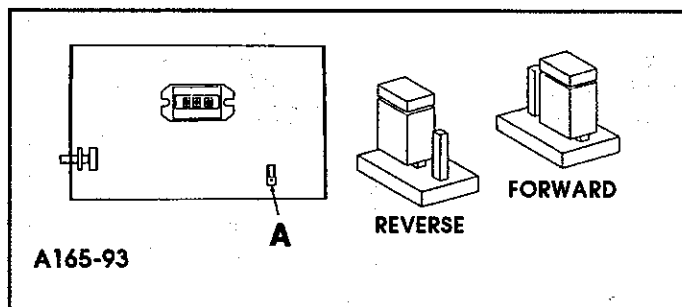


FIG. 20

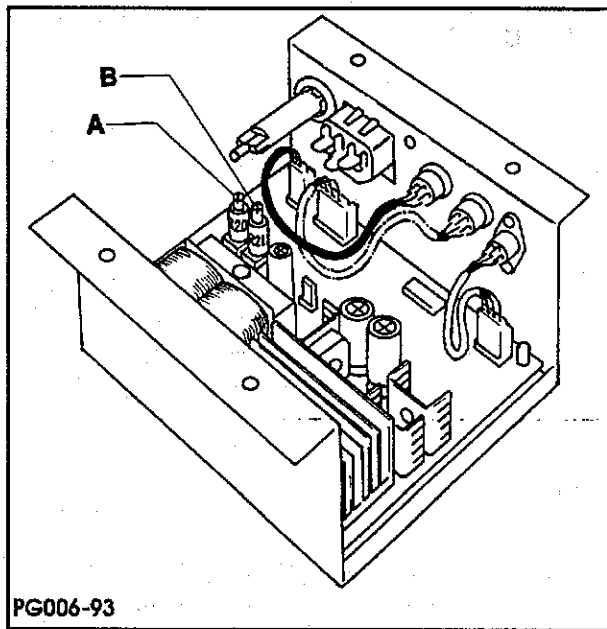


FIG. 21

## THREAD TENSION

Set the thread tension (A, Fig. 1) so the needle threads produce uniform stitches on the under surface of the fabric. The tension applied to the lower looper thread (B) should be very slight and just sufficient to steady the thread. Turning the tension knobs (A) clockwise increases the tension, turning counterclockwise decreases the tension.

## NEEDLE THREAD FRAME EYELET

Set the needle thread frame eyelet (A, Fig. 24)  $\frac{3}{8}$ " (9.5mm) above the center of mounting screw (B). The top of take-up wire (C) should be even with the top holes in the needle thread eyelet (D) with the hole at bottom of stroke. For less loop lower this setting, for more loop increase setting.

## LOOPER THREAD TAKE-UP

The looper thread can be properly controlled through adjustments of the looper thread take-up cam, cast-off plate assembly, retaining finger and eyelets.

The cast-off plate assembly (B, Fig. 25) is adjustable and its setting determines the amount of thread pull-off by the looper thread take-up cam. The cast-off plate assembly is set correctly when the looper thread take-up cam (E) is centered left to right in the slot and the looper thread just becomes taut as the looper reaches its extreme left position.

If adjustment is necessary loosen screws (A) and center the cast-off plate in the slots as a preliminary setting. Moving the cast-off plate assembly up towards the bottom of the screw slots causes more thread to be pulled from the cones. Moving the cast-off plate assembly down towards the top of the screw slots causes less thread to be pulled off. Retighten screws (A).

The eyelets (D) can be used to obtain more or less looper thread and are correctly set when the looper reaches its extreme left position the thread becomes taut.

Note: Adjustment of the cast-off plate assembly will affect this setting.

If adjustment is necessary loosen screws (C) and adjust eyelets (D), to the rear to increase the amount of looper thread, to the front to decrease the amount of looper thread. Retighten screws (C).

The looper thread take-up cam (E) is NOT spotted on the main shaft and can be adjusted. It is set correctly when the looper thread just, cast-off the highest lobe of the take-up cam when the point of the left needle is visible on the underside of the looper.

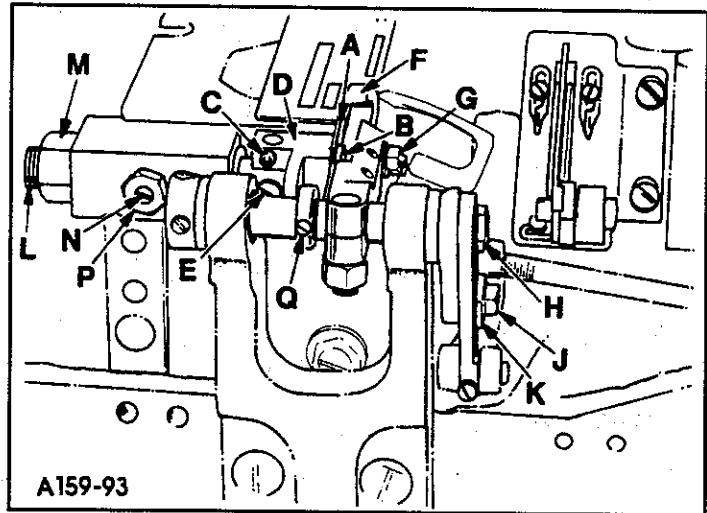


FIG. 22

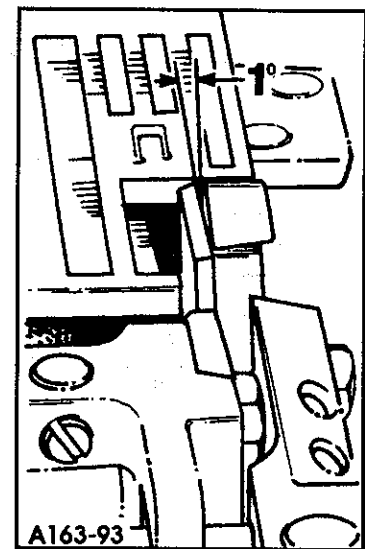


FIG. 23

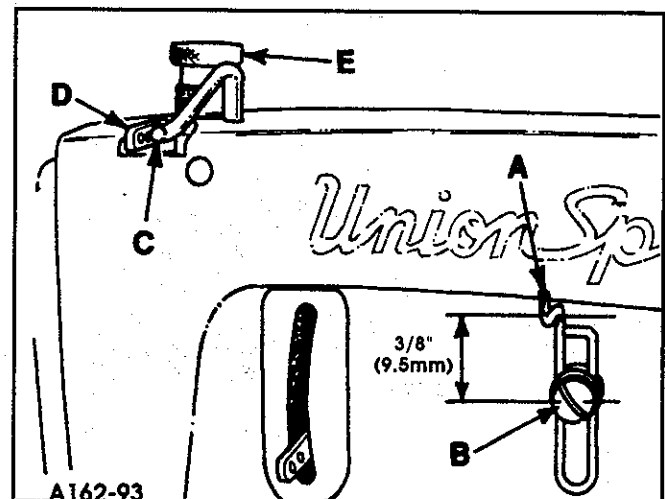
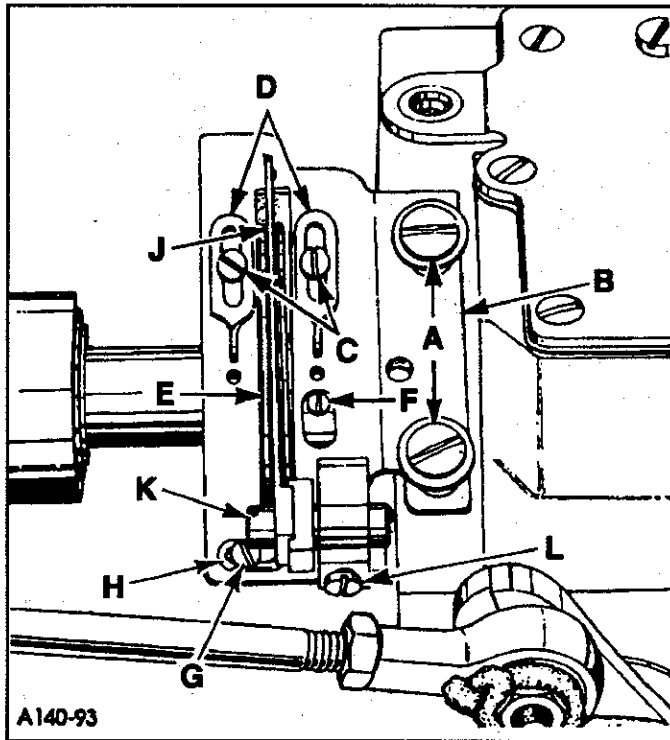
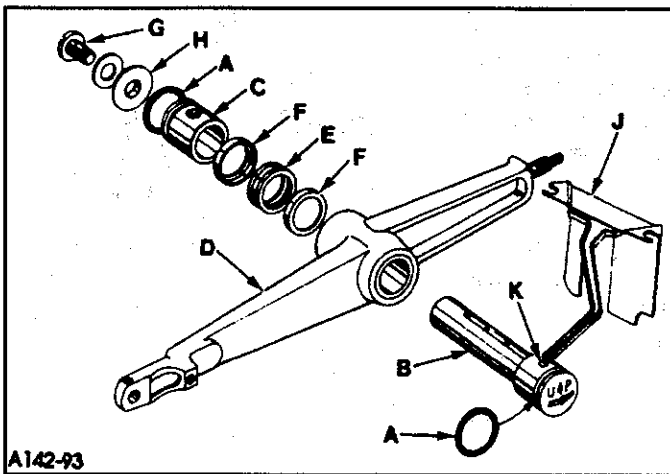


FIG. 24



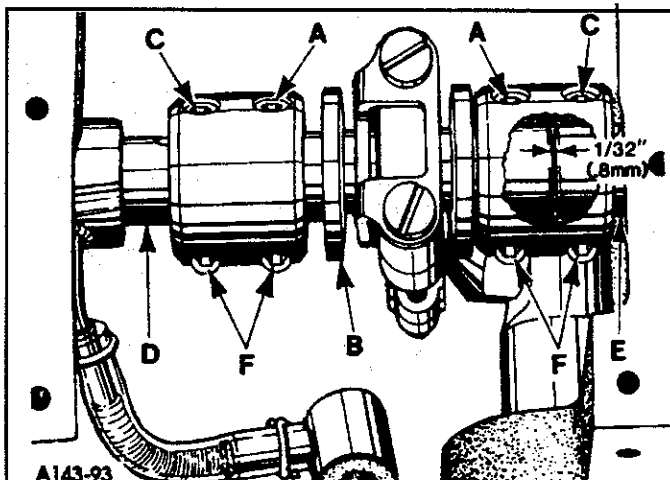
A140-93

FIG. 25



A142-93

FIG. 26



A143-93

FIG. 27

## LOOPER THREAD TAKE-UP (CONT.)

If adjustment is necessary loosen screws (F) and adjust take-up cam. Retighten screws (F).

Note: When adjusting the take-up cam make sure it is centered in the cast-off plate assembly slot before tightening screws (F).

Cast-off wire (H) should be centered right to left between the take-up disc. This can be accomplished by loosening screw (G) and positioning cast-off wire as required. Retighten screw (G).

The retaining finger (J) controls the amount of slack looper thread. It is properly set when it prevents the looper thread triangle from being wiped under the looper blade while the looper travels from right to left.

The retaining finger should be center in the take-up disc left to right. It should be set in front with a gap no higher than a 3/16" (4.8mm) from the underside of the finger to the top of the cast-off plate assembly. The rear setting should just clear the top of the cast-off wire by approximately 1/32" (.79mm).

If adjustment is necessary loosen screws (K) and (L) and adjust retaining finger as required. Retighten screws.

## PRESSER FOOT PRESSURE

Regulate the presser spring regulating screw (E, Fig. 24) so that it exerts only enough pressure on the presser foot to feed the work uniformly when a slight tension is placed on the fabric. Turning it clockwise increases the pressure, counterclockwise acts the reverse.

## TORQUE REQUIREMENTS

Torque specifications given in this catalog are measured in inch-pounds or centimeter/kilograms. All straps and eccentrics must be tightened to 19-21 in. lbs. (2.15-2.37Nm) unless otherwise noted. All nuts, bolts, screws, etc., without torque specifications must be secured as tightly as possible, unless otherwise noted. Special torque specifications for connecting rods, links, screws, etc., are shown on parts illustrations.

## SPECIAL INSTRUCTIONS

### NEEDLE LEVER

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

Install "O" rings (A, Fig 26) 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.

### NEEDLE LEVER (CONT.)

Install innercompression cup (F), temper load ring (E) and outer compression cup (F) onto stud (B), then push ring and cups through opening in machine bed.

Install thrust collar (C) onto stud (B) being careful not to damage "O" ring. Compress components together by tightening screw (G) until washer (H) 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 (G) 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 (J) so its hook sets in oil supply hole (K) 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).

### ALIGNMENT MAIN SHAFT TO CRANKSHAFT

As viewed looking down from rear of machine, spot screws (A, Fig. 27) 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. 28.

Looper drive crank (B, Fig. 27) must be positioned laterally with 1/32" (.8mm) clearance between it and main shaft (E) as shown in Fig. 26. 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. 29) 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.

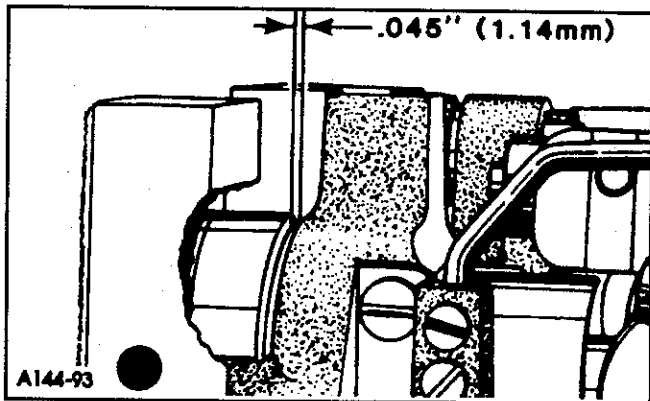


FIG. 28

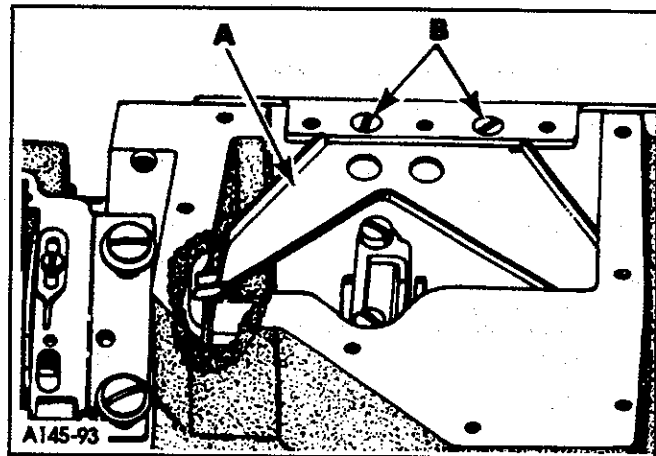


FIG. 29

### 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 III 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
<p>* 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.</p>		

TABLE III





NOTES

Blank lined paper for taking notes.

**NOTES**

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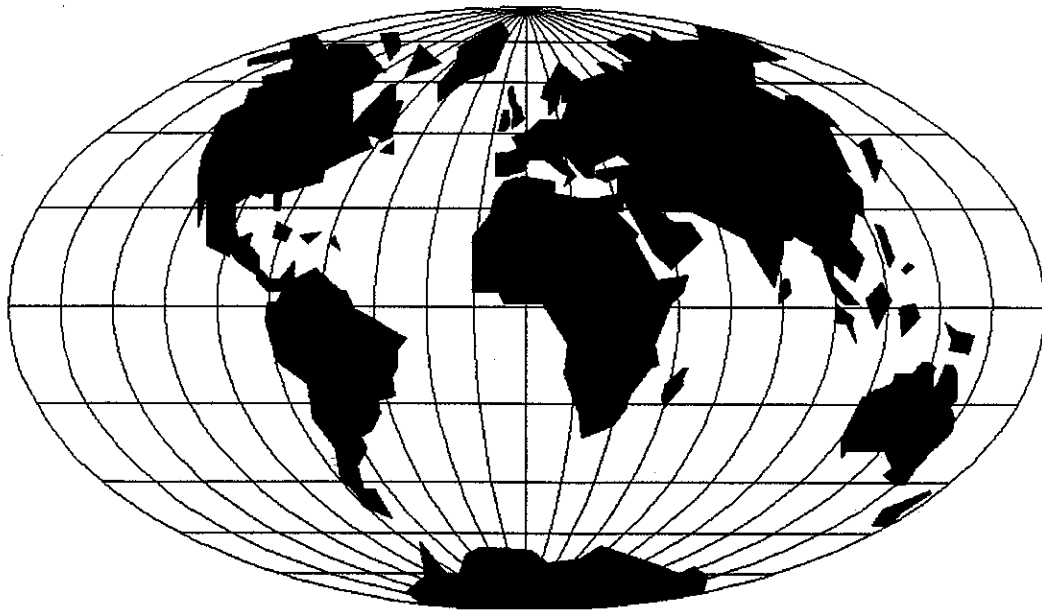
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