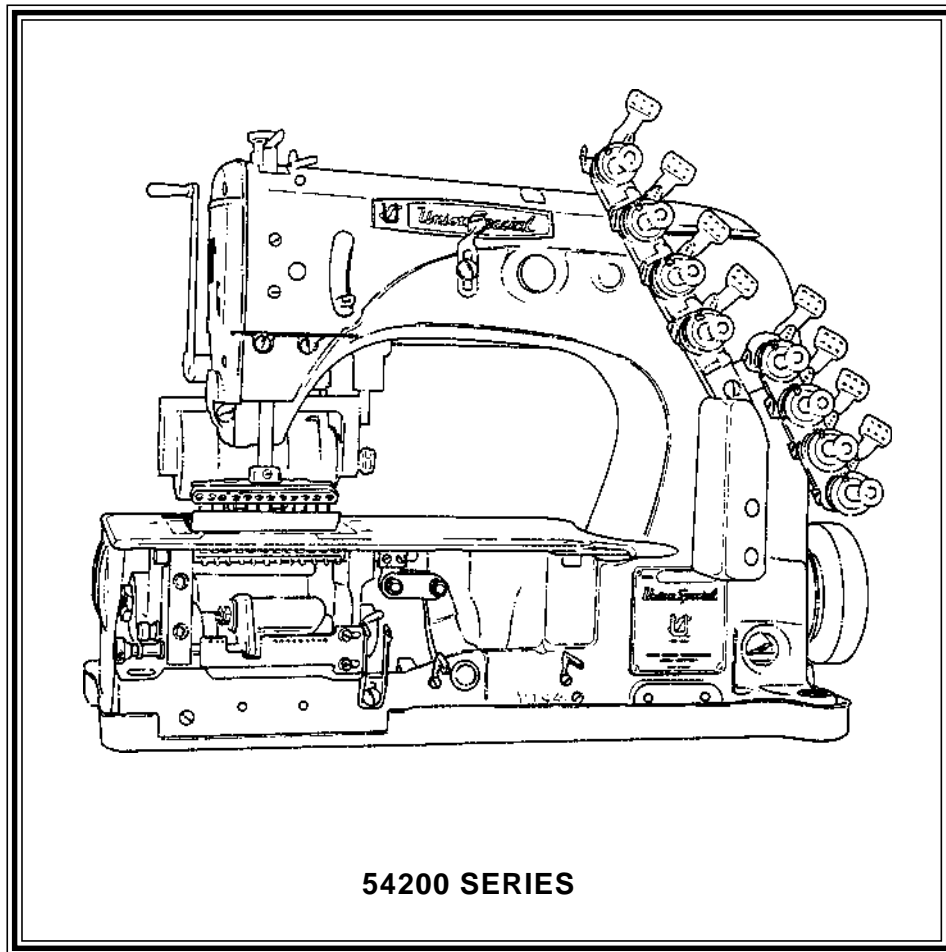


Union Special[®]

INDUSTRIAL SEWING EQUIPMENT

ADJUSTING INSTRUCTIONS



MANUAL NO. INS9203

STYLES

54200J-12-16

**Manual No. INS9203 Adjusting Instructions for the
54200 Series Flat Bed Machines
Style 54200-12-16
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PREFACE

This technical manual has been prepared to guide you while adjusting the 54200J-12-16 machine. It may be used in conjunction with Union Special Parts Manual PRT9204 and Union Special Catalog 102L.

This adjusting 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 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.

Este manual se ha hecho con la información básica disponible.

Cambios en diseño y la mejoras puede incorporar una pequeña modificación, de la configuración en las ilustraciones o número de partes.

Dieses Handbuch wurde auf Basis vorhandener Information erstellt. Konstruktionsänderungen und/oder Weiterentwicklungen können eine geringfügige Veränderung der Abbildungen oder der Teilenummern bedingen.

SAFETY RULES



CAUTION!

THESE SYMBOLS INDICATE THAT YOUR PERSONAL SAFETY IS INVOLVED

This equipment is designed to operate under specified voltage requirements. The electrical power to the equipment **MUST** match the voltage specifications for the equipment.

Before operating the machine check the direction of rotation of the handwheel. Breakage may occur if the direction of rotation is incorrect.

TO PREVENT PERSONAL INJURY:

Only qualified persons should operate the machine.

Wear safety glasses.

All shields and guards **MUST** be in position before operating machine.

DO NOT tamper with safety shields, guards, etc., while machine is in operation.

The main equipment power switch **MUST** be turned-off for the following:

- Threading needle, looper, spreader etc.
- Replacing sewing parts such as needle, presser foot, throat plate, looper, spreader, feed dog, needle guard, folder, fabric guard etc.
- The workstation is unattended or work has been completed for the day.
- For all maintenance work.
- When making adjustments to the machine.

DO NOT touch moving machine parts while the machines main power switch is turned-on **DANGER OF INJURY COULD OCCUR!**

The sewing unit should only be used for its intended purpose. All applicable safe guarding **MUST** be considered when making any modifications to the machine.

IMPORTANT!

Any work on the equipment should be done by authorized persons and only with the equipment power switch turned-off and its plug and air supply disconnected.

The above and all adjustments stated in the adjusting instructions should be adhered to for safe operation of this equipment.

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MACHINE IDENTIFICATION

Each Union Special machine is identified by a Style number which, on this machine, is stamped into the Style plate attached to the right front side.

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

CLASS DESCRIPTION

High throw machine equipped with a close coupled puller and 3 inch (76mm) wide rubber puller rollers, upper roller driven. Independent row, with twelve needles spaced every 1/4" (6.4mm). Twelve loopers travel in-line-of-feed and a throw-out device enables the operator to disengage the loopers from the driving mechanism, thus exposing the heel and eye of each looper for easy threading. Automatic enclosed type oiling system. Filter type oil return pump, oil pan base plate and head oil siphon assembly.

MACHINE STYLE

54200J-12-16 For decorative stitching operations on men 9 s, women 9 s and children's jackets, coats, beachwear and similar operations on medium to heavy-weight material. Varied effects can be produced by removing one or more needles, by using different colored thread in the needles, by attaching rick-rack or by quilting a portion of the garment using the same color thread in all needles.

- Stitch type 401
- Type 113 GS
- Maximum Speed 4000 R.P.M.
- 16 gauge only

NEEDLES

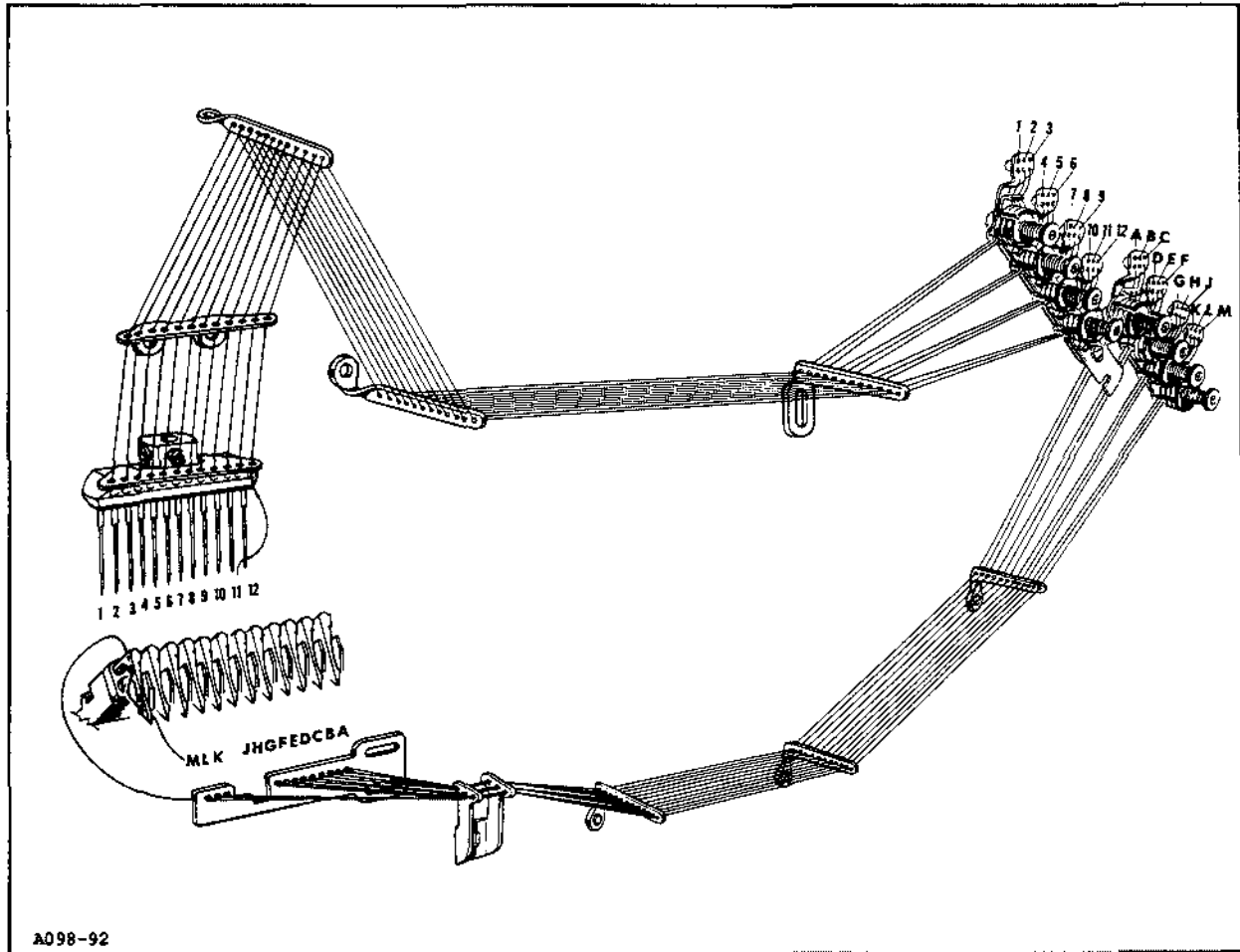
Each Union Special needle has both a type and size number. The type number denotes the kind of shank, point, length, groove, finish and other details. The size number, stamped on the needle shank, denotes the largest diameter of the blade midway between the shank and the eye. Collectively, the type number and size number represent the complete symbol which is given on the label of all needles packed and sold by Union Special.

The standard needle for the 54200i-12-16 is Type 113GS Size 125/049.

TYPE	DESCRIPTION	SIZES AVAILABLE	
113GS	Round shank, round point, extra short, double groove, spiral groove, struck groove, ball eye, spotted, chromium plated	075/029 080/032 090/036 100/040	110/044 125/049 140/054

Needle orders will be promptly and accurately filled when a sample needle, an empty needle package or the type and size number of the needle is forwarded. The type and size number is located on the needle package label. A complete order would read as follows: "1000 needles, type 113GS, size 100/040".

THREADING



The above illustration shows the proper way to thread the 54200J-12-16. Each thread on the tension assembly has a number or letter that must correspond with the same number or letter on the needle head and looper eyelets. Note that the needles are inserted at a right angle to the needle head with the s carf facing left. All needles are thread from right to left. All loopers are threaded from back to front.

OILING

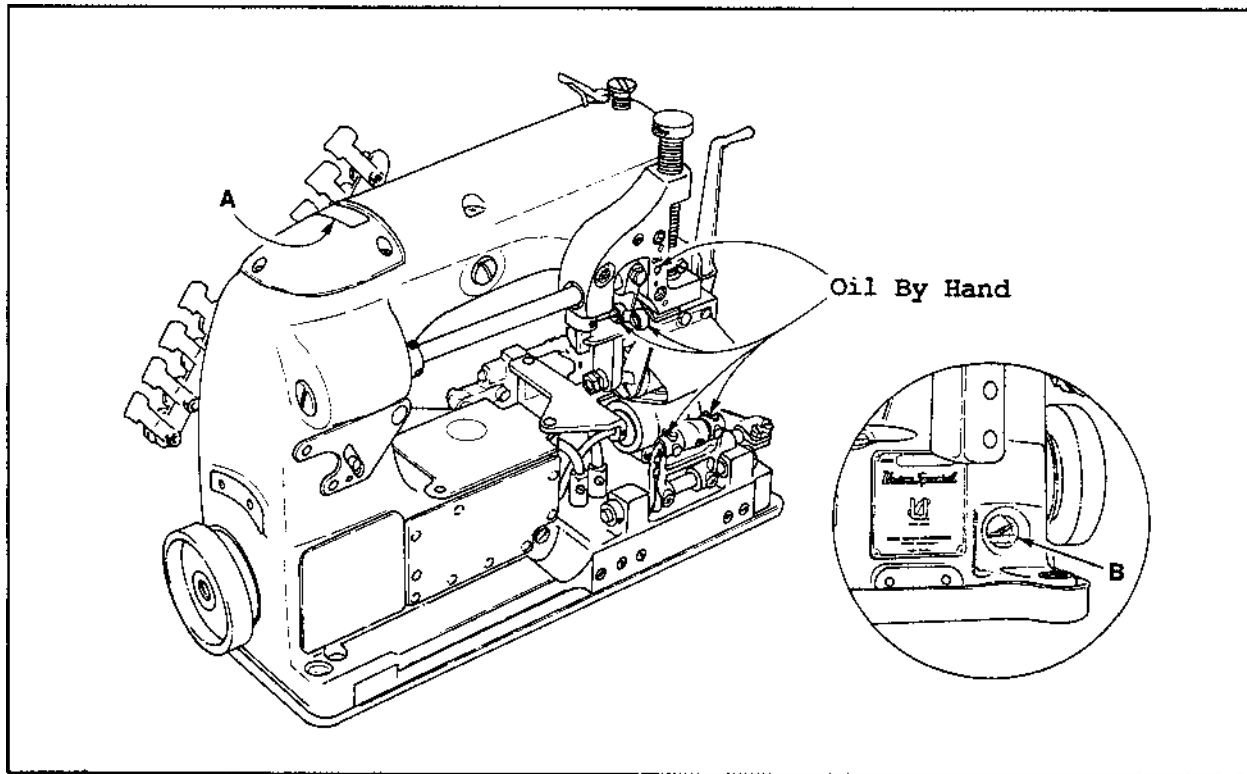


Fig. 1

Referring to Figure 1, fill the machine at (A) until the oil level is indicated between the red lines on gauge (B). Use a straight mineral oil, Saybolt viscosity of 90 to 125 seconds at 1000 fahrenheit. Run the machine slowly for a few minutes to allow the wicks to carry oil to the bearings. The puller drive shaft bushing and the puller connecting link must be oiled by hand.

TORQUE REQUIREMENTS

Torque (measured in inch-pounds or newton-meters) is a rotating force (in pounds applied through a distance by a lever) in inches or meters. This is accomplished by using wrench, screwdriver, etc. Many of these devices are available, which when set at the proper amount of torque will tighten the part to the correct amount and no tighter.

All straps and eccentrics should be tightened to 19-21 inch-pounds (2.2Nm-2.4Nm) unless otherwise noted. All other nuts, bolts, screws, etc. should be tightened by hand as tightly as possible, unless otherwise noted.

ADJUSTING INSTRUCTIONS

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

NEEDLE HEAD ALIGNMENT

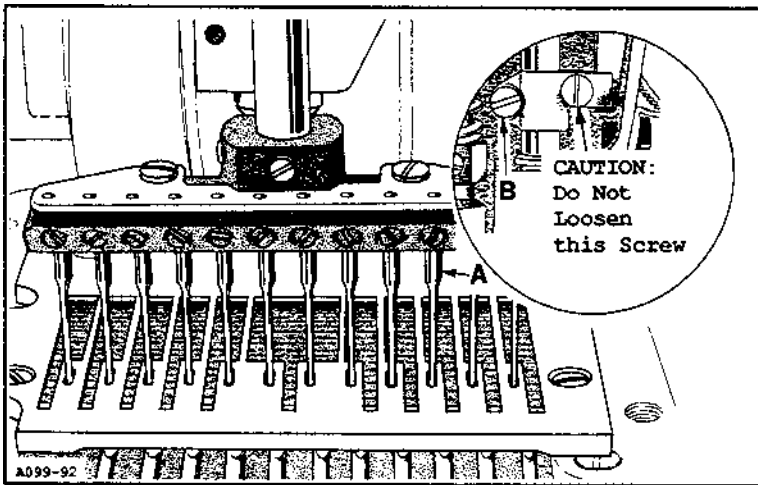


Fig. 2

Insert a new set of needles, type and size as specified in the description of the machine. Needles must be inserted with the spot or scarf to the left. Turn the handwheel in operating direction to bring needles (A, Fig. 2) down to ensure that they are aligned in the needle slots of the throat plate as shown. Adjustment can be made by loosening clamp screw (B, Fig. 2 Inset) slightly, allowing needle bar (A) to be turned as required. Tighten clamp screw (B).

SETTING THE NEEDLE BAR HEIGHT

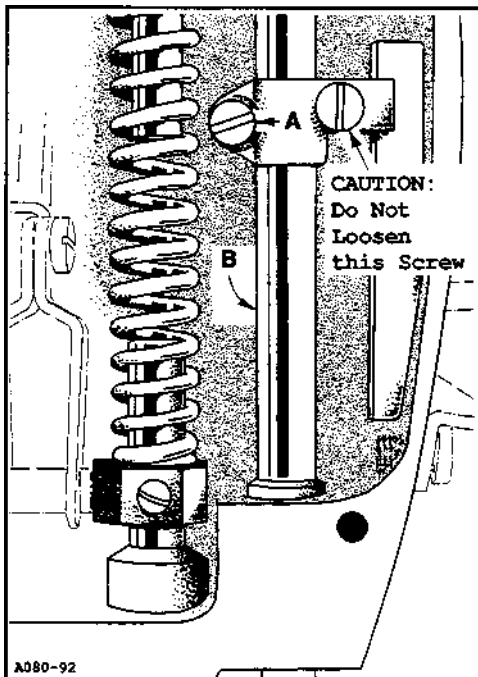


Fig. 3

The height of the needle bar is correct when the needle points are from $1/21$ " to $17/32$ " (12.7mm to 13.5mm) above the top surface of the throat plate and the needle bar is at the top of its stroke. If adjustment is necessary loosen needle bar clamp screw (A, Fig. 3) and move needle bar (B) up or down. Torque screw (A) to 20 in. lbs. (2.3Nm).

CAUTION: Care should be taken not to disturb the alignment of the needles in the throat plate when moving the needle bar up or down.

SETTING THE LOOPER HOLDER REST

The looper holder rest must be set so it prevents the loopers, looper holder and/or the needle guards from striking the looper thread eyelet when the looper throw-out pin is disengaged.

Turn the handwheel in operating direction until the needles are at their highest position. Loosen screw (A, Fig. 4) and adjust looper holder rest (B) front to back so looper holder (C) will stop against rest (B) when the looper throw-out pin is disengaged. Check the position of the loopers and needle guards to make sure they do not contact looper thread eyelet (D).

NOTE: To return the looper holder to a sewing position pull out on the looper throw-out plunger knob and push against the looper holder frame. Release knob.

SETTING THE LOOPER HOLDER THRUST AND THROW-OUT SPRING TENSION

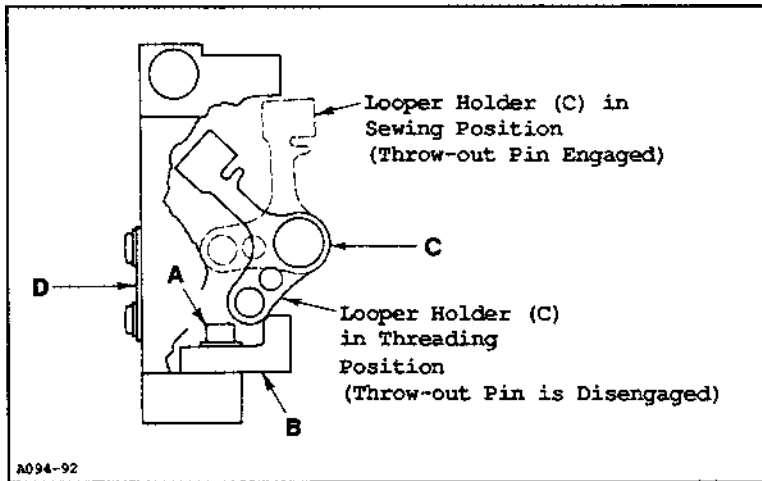


Fig. 4

The looper throw-out tension must be set so the looper holder will "snap" to the threading position when the looper holder throw-out pin is disengaged.

Turn the handwheel in operating direction until the needles are at their highest position and pull looper throw-out knob (A, Fig. 5) to the left releasing looper holder (B) to a threading position. As viewed from the right end of the machine, loosen collar screws (C) and rotate collar (D) in a counterclockwise direction until spring (E) creates a slight tension against the back of the looper holder. Thrust "E" ring (F) and collar (D) together to remove all right to left play in looper holder (B). Tighten collar screws (C).

Note: There must be no shake or bind when the handwheel is rotated.

SETTING THE LOOPER GAUGE

Starting from the extreme right with the looper point facing the operator insert looper (A, Fig. 6) through the back of needle guard (B) and as far down as it will go into looper holder frame (C). Repeat the above with the looser and needle guard on the extreme left.

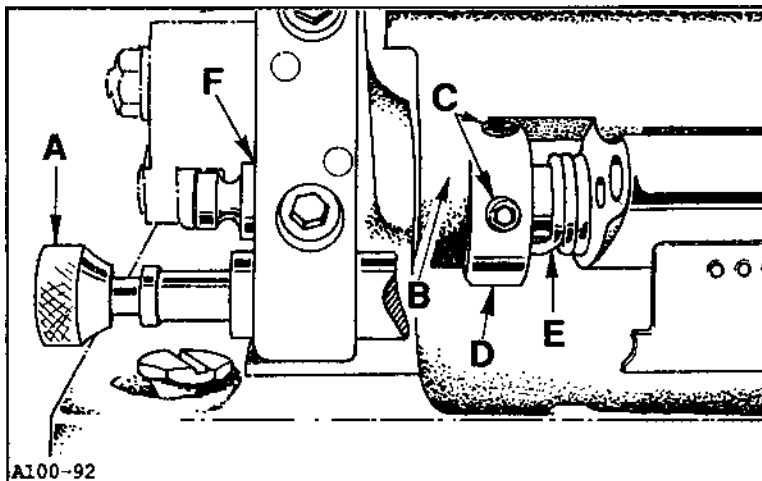


Fig. 5

Note: Checking the looper gauge on the right and left side first will enable you to tell if the needle bar alignment is correct. If the looper gauge is not the same on both sets of loopers and needles refer to the "NEEDLE HEAD ALIGNMENT" section. Recheck the needle bar height if any of the above adjustments were altered.

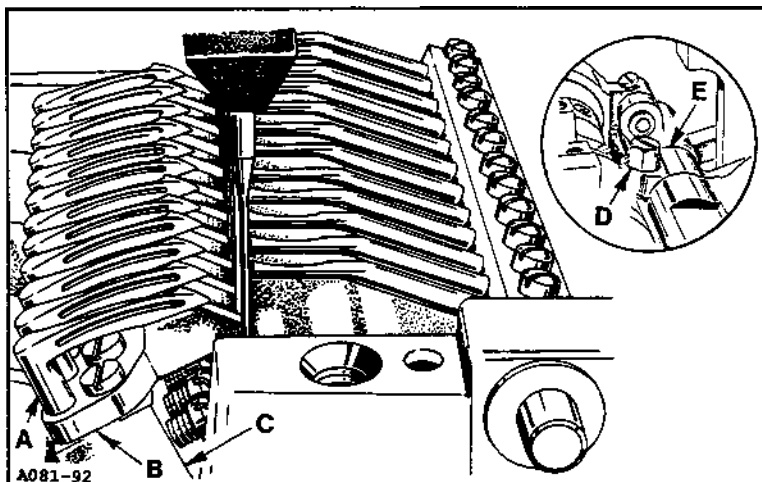


Fig. 6

SETTING THE LOOPER GAUGE (CONT.)

Move the needle guard to the side so the needle will not strike it. Turn the handwheel in operating direction until the looper holder frame has travelled fully to the rear. At this time the distance between the centerline of the needles and the points of the loopers should be $1/8"$ (3.2mm). If adjustment is necessary loosen hexagon head clamp screw (D, Fig. 6 Inset) at the right end of looper holder driving arm (E) and move forward or backward as required. Tighten screw (D) and recheck settings.

SETTING THE NEEDLE GUARDS

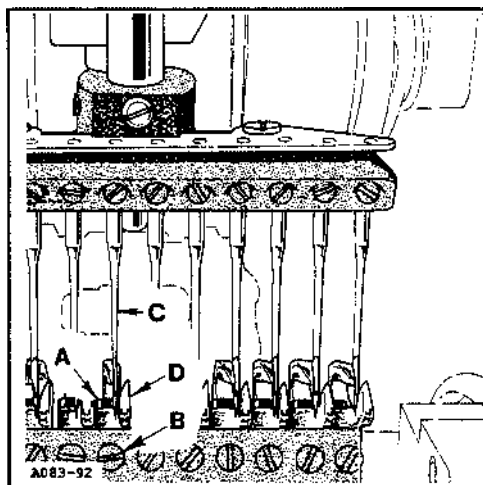


Fig. 7

The needle guard screws (A, Fig. 7) cannot be accessed once the loopers are tightened so the needle guards must be set first. Loosen looper screw (B) and swing the looper to the side so the needle will not strike it. Do not remove the looper because the needle guard looper hole must remain aligned with the hole in the looper holder. Turn the handwheel in operating direction until needles (C) are at their lowest point of travel. Position needle guard (D) so it touches but does not deflect the rear of needle (C). Tighten needle guard screw (A).

SETTING THE LOOPERS

Turn the handwheel in operating direction. When each looper (A, Fig. 8) moves forward the point should pass the left side of needle (B) with a clearance of $0.000"$ to $0.003"$ (0.00MM to 0.08MM).

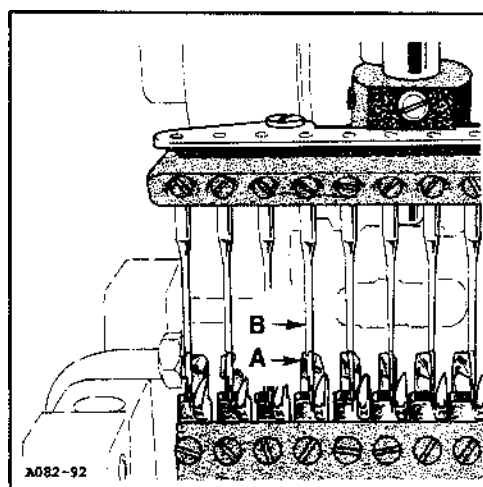


Fig. 8

SETTING THE RETAINERS

The retainers must be adjusted as close as possible to the top of the loopers without touching them and also set from the right to left for proper stitch formation.

Insert retainers (A, Fig. 9) into retainer holder bar (B) with the notched ends $1/32"$ (0.8mm) from the needles and the side of the notches facing the needles and tighten screws (C).

Loosen screws (D) in the retainer holder bar connection bar (E) and rock bar (B) so the underside of the retainer is as close as possible to the top of the looper without contacting it. Position the needle bar as high as possible and pull looper throw-out plunger knob (F) to the left, releasing the looper holder. Make sure the loopers do not hit the underneath side of the retainers.

SETTING THE RETAINERS (CONT.)

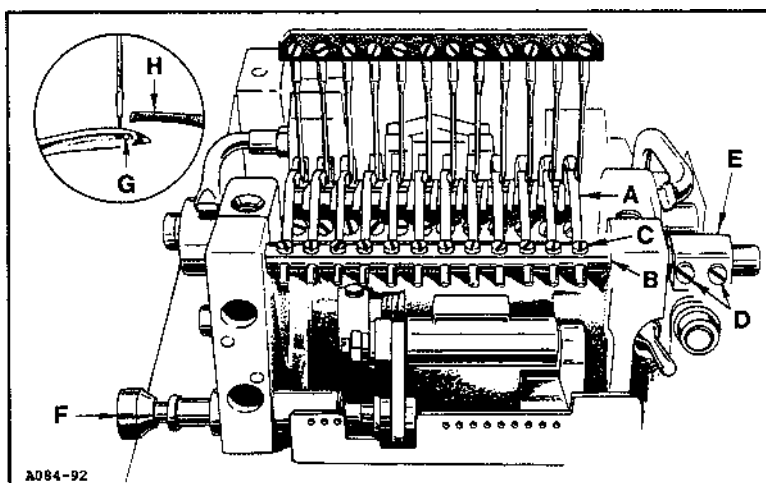


Fig. 9

NOTE: To return the looper holder to a sewing position pull the looper throw-out plunger knob to the left and push against the looper holder frame. Release knob.

To adjust the retainers from the right to left turn the handwheel in operating direction with the loopers travelling toward the operator. Position looper eye (G, Fig. 9 Inset) directly below the point of retainer (H).

Loosen screws (D, Fig. 9) and move retainer holder bar (B) right or left so the point on the right side of the retainer is in the center of the top of the looper blade at the eye. Tighten screws (D) and recheck to make sure loopers do not hit the underneath side of the retainers.

SETTING THE FEED DOG

The feed dog should be centered in the throat plate from left to right and front to back when the machine is set at the desired stitch length. The tips of the teeth on the feed dog must be parallel and protrude 1/32" (0.8mm) above the throat plate at the highest point of travel.

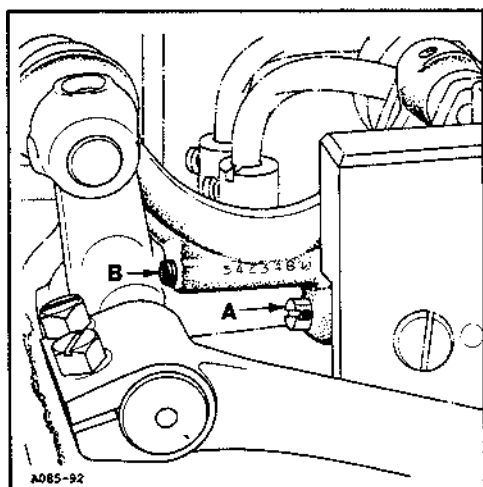


Fig. 10

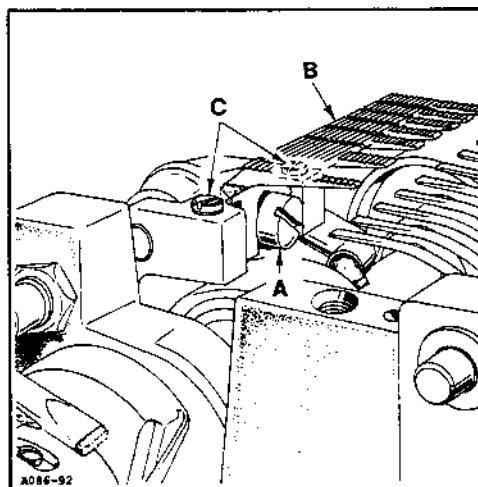


Fig. 11

To set the feed dog parallel to the throat plate loosen screw (A, Fig. 10) and turn screw (B) clockwise to tilt the front of the feed dog up or counterclockwise to tilt the front of the feed dog down. Retighten screw (A)

To set the feed dog height rotate the handwheel in

operating direction until the feed dog is at its highest position. Loosen screw (A, Fig. 11) and remove feed dog (B). Turn height adjusting screws (C) clockwise to lower or counterclockwise to raise the feed dog. The feed dog should extend 1/32" (0.8mm) above the throat plate surface. Retighten screw (A).

SETTING THE FEED DOG (CONT.)

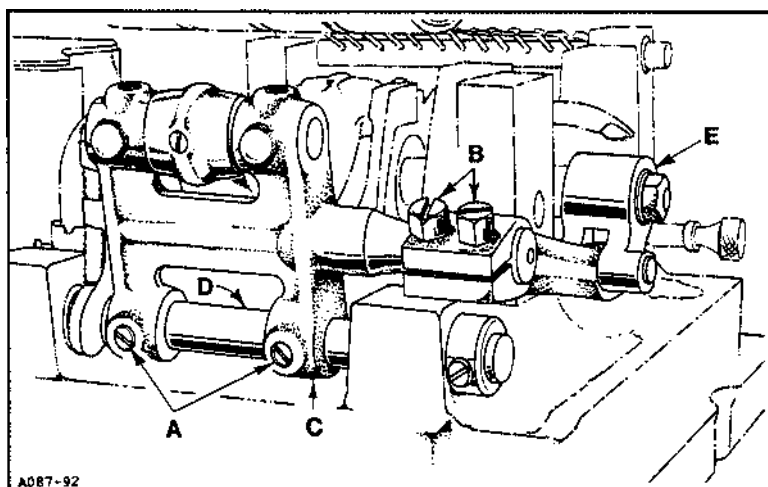


Fig. 12

To center the feed dog from left to right rotate the handwheel in operating direction until the feed dog is at its highest position. Loosen screws (A and B, Fig. 12) and move feed rocker (C) right or left on feed rocker shaft (D) as required. Retighten screws (A and B).
CAUTION: Check to ensure that feed crank link subassembly (E) does not bind when handwheel is rotated 360°.

To move the feed dog from front to back loosen screws (B, Fig. 12) and move feed rocker arm (C) as required. Tighten screws (B). One full tooth should pass beyond the rear of the presser foot when the feed dog has travelled fully to the rear.

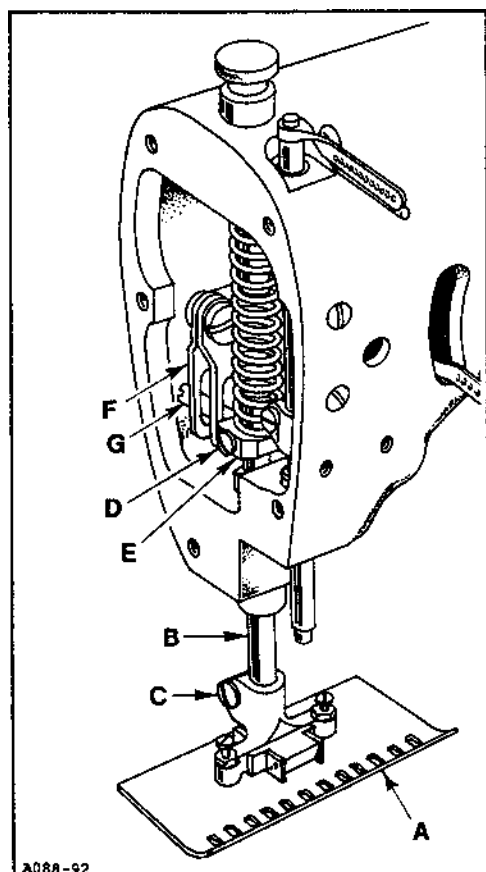


Fig. 13

SETTING THE PRESSER FOOT

Assemble presser foot (A, Fig. 13) to presser bar (B). Make sure that presser bar is fully inserted into presser foot shank. Line up the needle slots in the presser foot with the needle slots in the throat plate. Tighten screw (C).

If the presser foot is not resting flat on the throat plate the material will not feed properly. Loosen screw (D) and lift presser bar guide (E) up so there is a 1/16" (1.6mm) clearance between the lifter lever link (F) and the screw in the presser bar guide (G).

SETTING THE PRESSER FOOT PRESSURE

Located on the top of the machine directly behind the needle bar is a knurled screw to adjust the pressure of the presser foot. Adjust the pressure just enough to assure good even feeding of the fabric. Turn the screw clockwise to increase pressure or counterclockwise to decrease pressure.

SETTING THE TENSION RELEASE

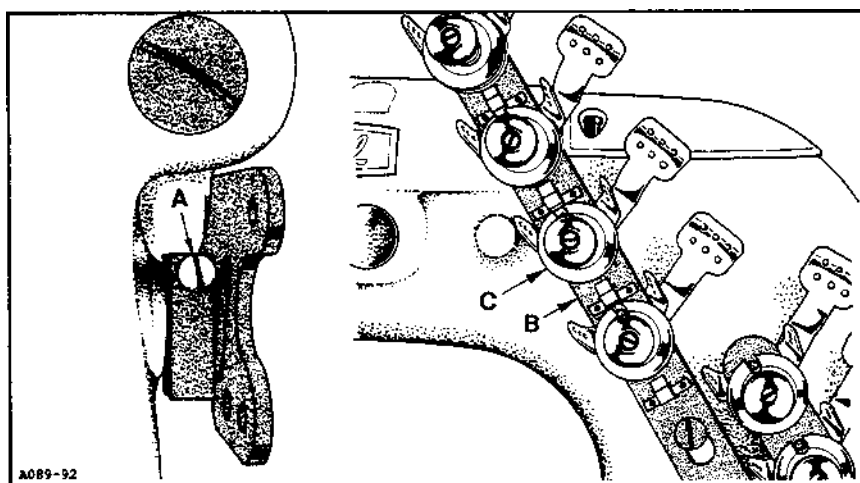


Fig. 14

The tension release is set properly so it begins to function when the presser foot has been raised 1/8" (3.2mm) from the throat plate surface and the tension disc is entirely released when the presser foot reaches its highest position.

Loosen screw (A, Fig.14) and adjust tension disc separator (B) up or down as required so all needle tension discs (C) will release at the proper time. Tighten screw (A)

SETTING THE STITCH LENGTH

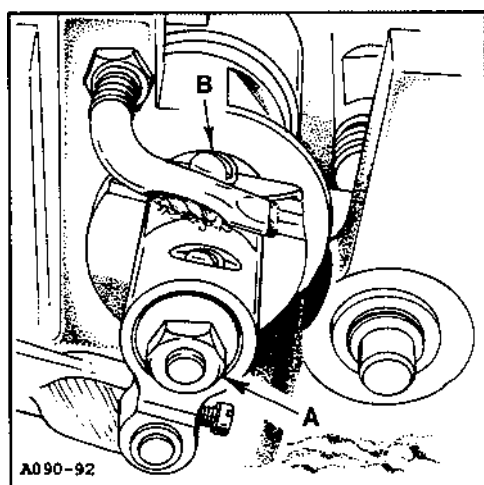


Fig. 15

This machine is designed to sew 7 to 14 stitches per inch. The normal factory setting is 12 stitches per inch. If the current stitch length has to be changed loosen locknut (A, Fig. 15) at the end of the mainshaft (it has a left-hand thread). Turn screw (B) clockwise to shorten the stitch or counter clockwise to lengthen the stitch. Tighten nut (A) and torque to 55 in. lbs. (6.2Nm).

NOTE: If the stitch length is changed the puller stitch length must be changed also.

TIMING THE PULLER

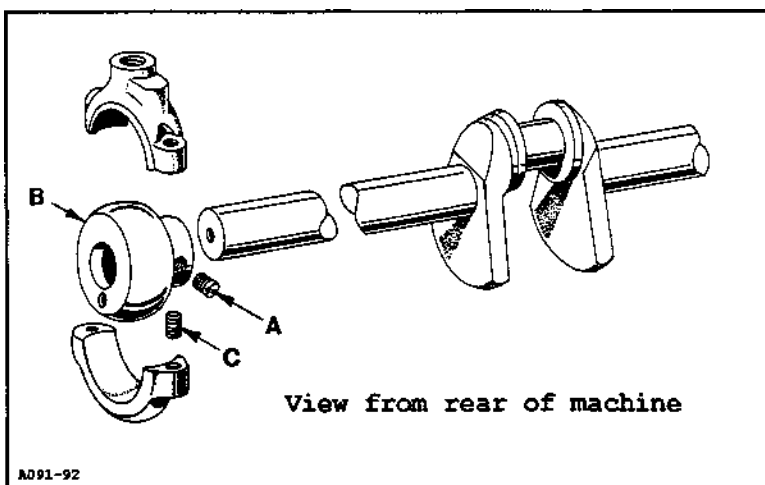


Fig. 16

The puller must be timed so it begins to feed material to the rear at the same time the feed dog feeds material to the puller.

Remove the crank chamber cover and rotate the handwheel in operating direction until the needles are at the top of their stroke. At this time screw (A, Fig. 16) on puller drive eccentric (B) should be facing the 3 o'clock position (toward the rear) and screw (C) should be facing the 6 o'clock position (straight down). If adjustment is necessary, turn the handwheel in operating direction until screw (C) is accessible

TIMING THE PULLER (CONT.)

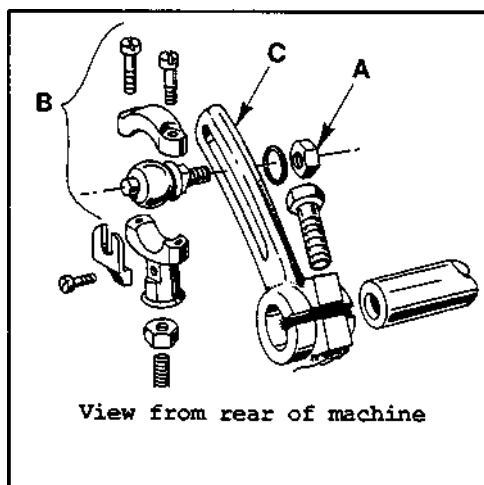


Fig. 17

and loosen. Continue to rotate the handwheel until screw (A) is accessible and loosen. Hold the eccentric in this position and rotate the handwheel until the needles reach the top of their stroke. Push the eccentric against the thrust collar and tighten screw (A). Rotate handwheel until screw (C) can be seen and tighten.

SETTING THE PULLER STITCH LENGTH

The puller stitch length must be set so it maintains tension on the fabric without stretching it. For example, if you desire 9 stitches per inch (SPI) the feed dog travel should be set to produce 10 SPI without the puller contacting the material. With the puller contacting the material 9 SPI should be produced. If adjustment is necessary remove the top right crank chamber oil cover and

loosen ball joint nut (A, Fig. 17). Move ball joint (B) to the rear of driving shaft segment (C) to produce less SPI (a longer stitch length) or move the ball joint to the front to produce more SPI (a shorter stitch length). Tighten nut (A) after each adjustment and check for final desired stitch length.

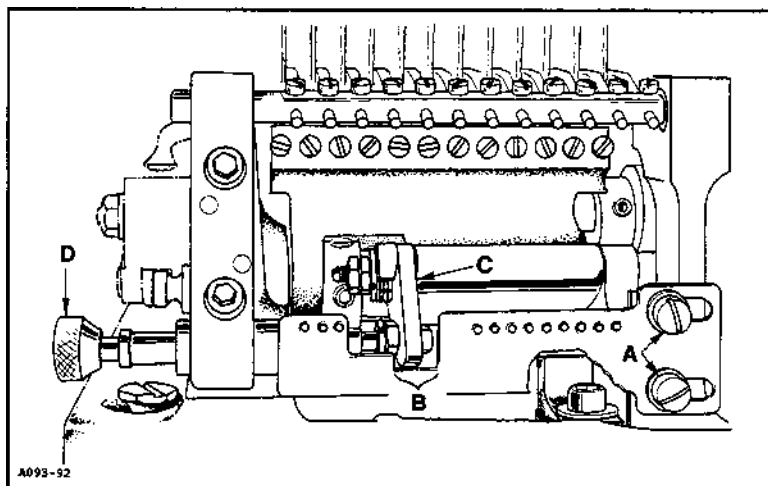


Fig. 18

SETTING THE LOOPER THREAD EYELET

Turn the handwheel in operating direction until the needles are at their highest position. Loosen screws (A, Fig. 18) and position eyelet notch (B) so it will allow looper throw-out fork (C) to pass over the notch when looper throw-out plunger knob (D) is pulled to the left, releasing the looper holder for looper threading. When the needles are at their lowest position looper throw-out fork (C) should not pass the left side of eyelet notch (B) if looper throw-out plunger knob (D) is pulled to the left.

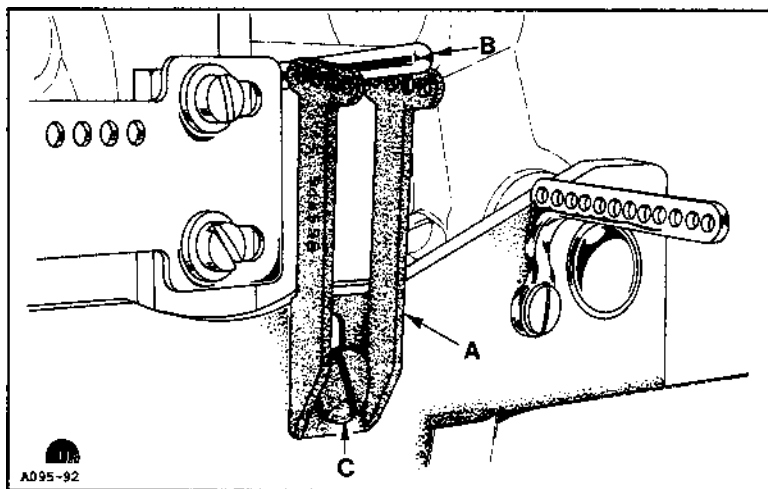


Fig. 19

SETTING THE THREAD EYELETS

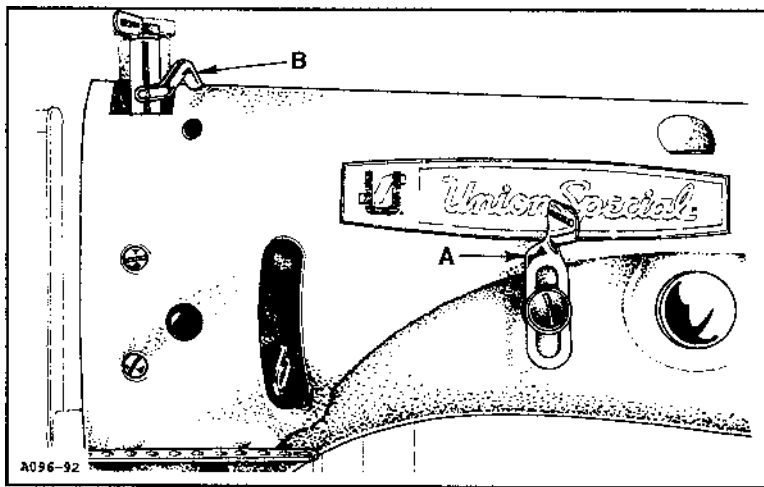


Fig. 20

Set looper thread take-up eyelet (A, Fig. 19) so take-up pin (B) begins to function when the loopers start their travel to the rear. Set frame needle thread eyelet (A, Fig. 20) as high as possible without pulling thread through the tensions on the downward stroke of the needle bar. Set needle thread take-up wire (B) so the threads contact it at the same time the thread loops leave the points of the loopers.

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