SINGER
206K25

TIPS ON SETTING UP MACHINE 206K25

After removing the machine from its packing case, set it up in the order noted below.

1. Inspect for damage incurred during transit.
2. Turn machine pulley over toward you to make certain that sewing mechanism turns freely.
3. Wipe off all traces of the tacky anti-rust oil that is used to protect the polished and plated surfaces. Give particular attention to the needle thread tension assembly, during this operation.
4. Remove the bobbin case. Wipe the bobbin case and the under thread tension spring on the bobbin case free of tacky oil.
5. By means of an oil can filled with Varsol, flood the sewing hook assembly. Turn the machine pulley by hand for about five minutes until all the tacky oil is washed out. Then apply **SINGER** SEWING MACHINE OIL and run-in the machine again by hand for five minutes.
6. Oil the sewing machine completely. (See pages 45 to 48.) Wipe away all surplus oil.
7. Make sure that arm shaft has a slight amount of end play (approximately .005 inch) for heat expansion clearance. If necessary loosen screw in flanged bushing and adjust as instructed in second paragraph on page 43.
8. Apply electric motor and light and check operating behavior of machine.
9. Check condition of needle before making sewing tests. (See page 2.)
10. Sew-in the machine and check stitching for correct behavior of bight controls. (See pages 19 to 27.)
11. Polish the head to a satin finish. Do not leave an oily or a greasy film on any portion of the head or the cabinet.

TO ALL WHOM IT MAY CONCERN:

The improper placing or renewal of the Trade Mark "**SINGER**" or any other of the Trade Marks of The Singer Manufacturing Company (all of which are duly Registered Trade Marks) on any machine that has been repaired, rebuilt, reconditioned, or altered in any way whatsoever outside a SINGER factory or an authorized SINGER agency is forbidden.

20613

ADJUSTERS MANUAL

FOR

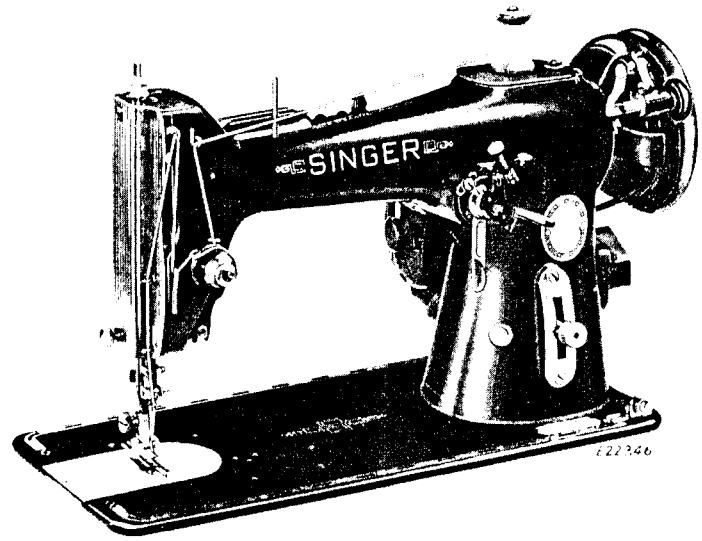
SINGER*

ELECTRIC SEWING MACHINE

206K25

FOR COMBINED STRAIGHT AND ZIGZAG STITCHING

REVERSIBLE FEED



See Index on pages 48 to 52

THE SINGER MANUFACTURING COMPANY

*A Trade Mark of THE SINGER MANUFACTURING COMPANY

ORDER OF MACHINE INSPECTION AT THE BENCH

1. Obtain complete information concerning the customer's sewing problem before making any adjustments.
2. Obtain samples of the customer's material and thread for final testing.
3. Check threading of machine. (See Form 20616, Instructions for Using Machine 206K25.)
4. Inspect the needle for—
   a. Make. All SINGER needles are marked with the Company's trade mark "SIMANCO*".
   b. Size in comparison with the thread in use. (See page 5.)
   c. Condition of wear or damage. (Needle bent or blunt—needle eye rough.)
   d. Location in needle hole. Check for straight sewing and for maximum zigzag stitching. (See pages 28 and 29.)
5. Check condition of needle hole or slot in presser foot and in throat plate.
6. Check thread clearance between position finger and bobbin case holder. (See page 37.)
7. Check relationship of needle with sewing hook. (See page 35.)
8. Inspect hook timing at central position of needle. (See page 36.)
9. Check needle bar height at extreme left-hand bight position. (See **NOTE** on page 37.)
10. Check feed mechanism for—
    a. Timing of feed movement. (See pages 32 and 33.)
    b. Feed dog height. (See page 31.)
    c. Position of feed dog in throat plate slots. (See page 32.)
11. Check pendulum motion of needle bar. (See page 30.)
12. Test bight controls, using paper perforation tests—
    a. Central position for straight sewing. (See pages 23 and 24.)
    b. Zigzag motion expanding from central position. (See pages 24 to 26.)
    c. Zigzag motion expanding from left-hand position. (See pages 24 to 26.)
    d. Left-hand position for straight sewing. (See pages 26 and 27.)
13. Check arm shaft connection belt for looseness.

DESCRIPTION

Machine 206K25, designed for straight stitching and for ornamental zigzag stitching, has the following characteristics:

Single Vibrating Needle. Lock Stitch.

Belt-Driven Rotary Sewing Hook on a Horizontal Axis.

Link Take-up.

Reversible Drop Feed.

Universal Bobbin Winder.

Two-needle clamp furnished for air tucking.

BA3 Electric Sewing Motor with SINGERLIGHT.

Graduated Stitch Indicator Plate.

Maximum Length of Stitch, 6 to the inch. Length of stitch controlled in either direction by an Adjustable Stop Screw.

Needle Bar Stroke 1-9/64 inches.

Presser Bar Lift 5/16 inch.

Maximum Zigzag Movement of Needle (Maximum Bight) 3/16 inch.

Width of Zigzag (Bight) infinitely variable up to the above maximum. Needle can vibrate equally, to a maximum of 3/32 inch, on either side of a point midway between the extremes of throw (Central Bight) or up to 3/16 inch toward the right of the extreme left throw (Left-hand Bight).

Straight Stitching can be performed at Central Position or at extreme Left-hand Position of the needle.

Sewing Hook rotates **across** line of feed, making **two** revolutions for each revolution of the Arm Shaft.

Hook Shaft and Gears are carried in a totally enclosed Gear Case suspended from the front bushing and anchored to Bed through opposing set and cap screws.

Location of Hook Shaft, at sewing hook end, controlled by the front bushing.

Bed 14-5/8 inches long and 7 inches wide.

Space at right of needle 7-3/4 inches.

Needles threaded from front toward rear.

Machine Pulley, with outside diameter of belt groove 3-1/4 inches, is for a 3/8 inch "V" Belt; can be used for 5/16 inch Round Belt.

When in operation, the top of the Machine Pulley should always turn over **toward** the operator.

SPEED

The maximum speed recommended for these machines is **1200** R.P.M., according to the material being sewn and the type of work being done. It is advisable to run a new machine **slower** than the maximum speed for the first few minutes to allow time for the oil to reach the moving parts.

DESCRIPTION OF 206 X 13 NEEDLES

See Fig. 2

Needles for Machine 206K25 are of **Class** and **Variety** 206 x 13 and are made in **Sizes** 9, 11, 14, 16 and 18.

The size of the needle to be used depends upon the size of the thread which must pass freely through the eye of the needle.

Do not use rough or uneven thread or thread which passes with difficulty through the needle eye, as such thread will interfere with the successful use of the machine.

Orders for needles must specify the **Quantity** required, the **Size** number, also the **Class** and **Variety** numbers, separated by an **x**.

The following is an example of an intelligible order:

"100 No. 18, 206 x 13 Needles."

The best stitching results will be obtained with needles sold only by Singer Sewing Machine Company.

Although needles are made with **different diameter of blades, certain dimensions remain constant** for all needles of the same Class and Variety.

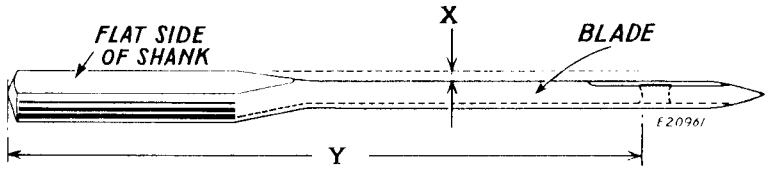


Fig. 2. Needle Distances

For example, the distance **X** between the short-groove side of the needle blade and the position of the flat-side of the needle shank, seated in the needle bar, is **constant**, maintaining an identical relationship between short-groove side of all 206 x 13 needles and the hook point. Therefore, any increase in the **diameter** of the blade results in a shifting of only the **centerline** of the needle blade away from the hook point.

Another **constant** is the distance **Y** from the end of the shank to the top of the eye, maintaining an identical relationship between the eye and the hook point, during the **formation of the thread loop.**

However, the size of the needle eye increases with the size of the needle to accommodate heavier thread. Therefore, any **increase** in the length of a 206 x 13 needle is made from the **top of the needle eye toward the point** of the needle.

NEEDLES AND THREADS

For perfect stitching, the thread should be selected according to the fabric to be stitched and the needle must be the correct size for the thread.

CHART SHOWING THE RELATIONSHIP OF TYPES OF FABRICS, THREAD AND NEEDLE SIZES AND MACHINE STITCHES TO THE INCH

Types of Fabrics	Thread Sizes	Needle Sizes	Machine Stitches Per Inch	
			Inside Seams	Top Stitching
Filmy materials comparable to Net, Marquisette, Organdie, Ninon.	100 Cotton OO and OOO Silk	9	20	30
Sheer materials comparable to Lawn, Dimity, Voile, Batiste, Chiffon, Rayon, Sheer, Rayon Crepe.	80 to 100 Cotton O Silk	11	16	20
Lightweight materials comparable to Gingham, Chambray, Sheer Wool Crepe, Taffeta.	60 to 80 Cotton A and B Silk	14	12	18
Medium lightweight materials comparable to Poplin, Pique, Percale, Chintz, Faille, Cretonne, Bengaline, Wool Flannel, Wool Crepe, Wool Jersey.	50 to 70 Cotton B Silk	14	12	16
Medium heavy materials comparable to Crash, Gabardine, Rep, Corduroy, Velveteen.	40 to 50 Cotton C Silk	16	10	12
Heavy materials comparable to Denim Ticking and Overcoating.	30 to 40 Cotton	18	8	10
Plastic materials.	Mercerized Cotton	11	10	12

When ordering needles, always specify Class and Variety 206 x 13 and state the size and quantity required.

TWIST OF THREAD

For ordinary stitching, either right or left twist thread can be used in the needle and in the bobbin.

When performing two-needle work, **right twist thread** should be used in the left-hand needle.

When sewing with single needle set at left of central bight, it is advisable to use **right twist thread** in the needle.

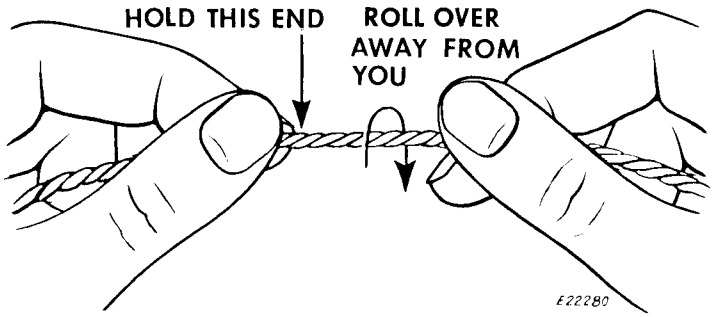


Fig. 3. Determining the Twist of Thread

To determine the twist of thread, hold the thread as shown above and turn the thread over away from you between thumb and forefinger of right hand. If the thread is right twist, the strands will wind tighter; if left twist; the strands will unwind.

TO PREVENT BREAKING OF NEEDLES

The most common cause of needle breakage is the pulling of the material by the operator, while the machine is sewing. This practice is entirely unnecessary, as the machine (when properly adjusted) will feed the material correctly without assistance.

Attempting to perform zigzag stitching, while the machine is fitted with straight stitching throat plate or presser foot, can also cause the breaking of needles.

The needle may break unless it is correctly located in the needle clamp, as instructed on page 7, or unless the correct relative position between the needle, throat plate and presser foot is maintained, as instructed on pages 28 to 31.

The needle or the hook point may break unless the machine is correctly timed, as instructed on pages 34 to 36.

LOCATION OF NEEDLE IN NEEDLE CLAMP

Unless the needle is placed in the slot of the needle clamp correctly and is threaded correctly, the machine will not sew.

The open side of the needle slot is at the front of the needle clamp, facing the operator, as shown in **Fig. 4.**

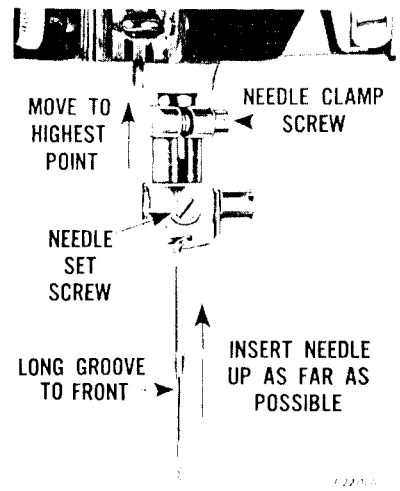


Fig. 4. Setting the Needle

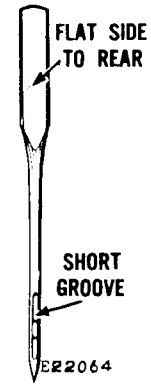


Fig. 5. Flat and Grooved Sides of Needle (Enlarged)

Loosen needle set screw and insert needle in the needle clamp slot all the way up against the stop with the flat side of the shank of the needle facing the rear of the machine, away from the operator, then securely tighten needle set screw.

You will note from **Fig. 5** that the side of the needle with the flat on the shank has a **short** groove at the eye, while the opposite side has a **long** groove. On all machines the needle is threaded from the long groove side toward the short groove; thus the needle on this machine is threaded from front to rear.

FORMATION OF THE LOCK STITCH

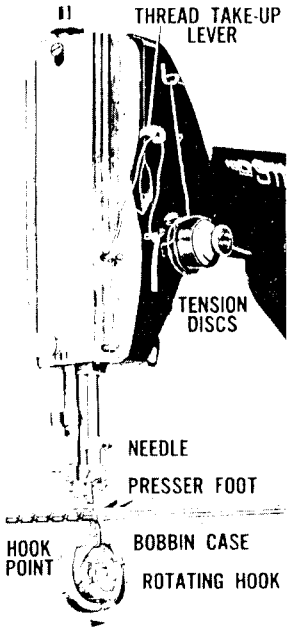


Fig. 6. Point of Hook Entering Loop of Needle Thread

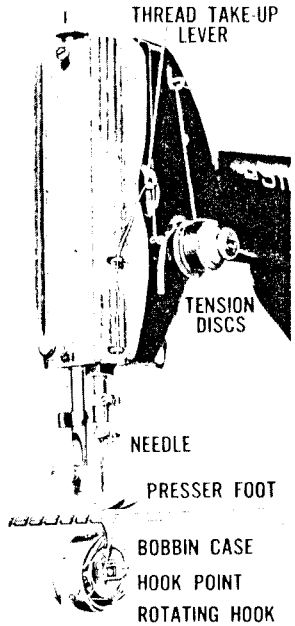


Fig. 7. Loop of Needle Thread Enclosing Bobbin Case

Fig. 6 shows the **first stage in stitch formation.** The thread leading to the needle is loosened because the **thread take-up lever has begun its descent;** the needle, after having descended to its lowest point, has been slightly raised and a loop of thread is thus formed which is immediately entered by the hook point which rotates in one direction around the **stationary** bobbin case.

Fig. 7 shows the **second stage.** The loop of needle thread has been taken by the point of the hook and is being passed around the bobbin case containing the bobbin of under thread, sufficient enlargement of the loop having been permitted by the descent of the thread take-up lever.

FORMATION OF THE LOCK STITCH (Continued)

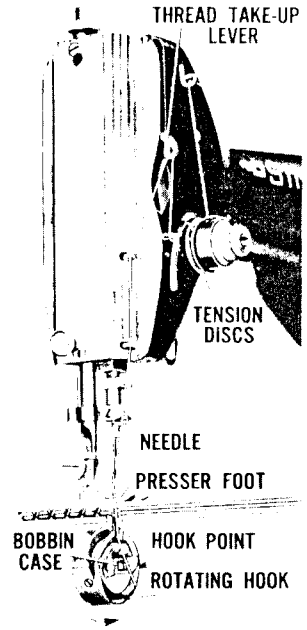


Fig. 8. Bobbin Thread Enclosed by Needle Thread

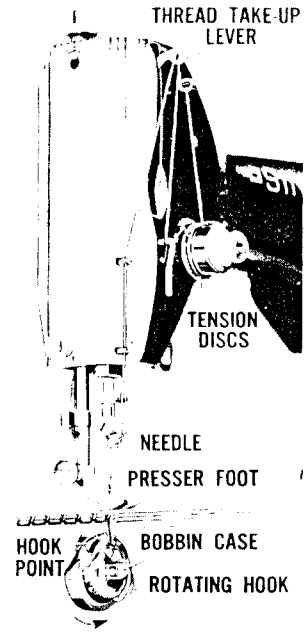


Fig. 9. Stitch Completed

Fig. 8 shows the **third stage.** The loop of the needle thread has been **cast off** from the hook. The bobbin thread has been enclosed by the needle thread and the thread take-up lever is being raised to tighten the stitch.

Fig. 9 shows the lock stitch completed. The thread take-up lever has been raised to its highest point, drawing the needle thread together with the bobbin thread into the middle of fabric. The two threads are then locked.

Tension on the needle thread is regulated by the tension discs at the front of the machine head. **Tension on the bobbin thread** is regulated by the screw nearest the center of the spring on the bobbin case. To increase bobbin thread tension, turn this screw gradually over to the right. To decrease bobbin thread tension, turn this screw gradually over to the left.

THE PERFECT LOCK STITCH

STRAIGHT STITCHING

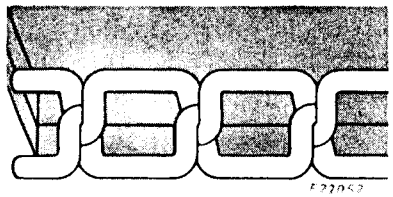


Fig. 10. Cross Section View of Perfect Lock Stitch

ZIGZAG STITCHING

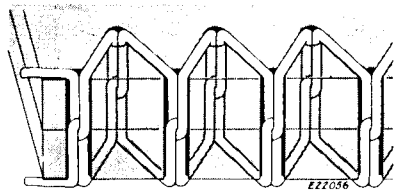


Fig. 11. View of Perfect Zigzag Lock Stitch

When the tensions of both the needle thread and the bobbin thread are correctly adjusted, the stitches should be **locked in the center of the thickness of the material**, as shown in **Figs. 10** and **11** above.

When the **tension of the needle thread is set TOO TIGHT in relation to the bobbin thread**, excess bobbin thread is drawn to the top of the material, causing a LOOSE STITCH, as shown in **Figs. 12** and **13** below.

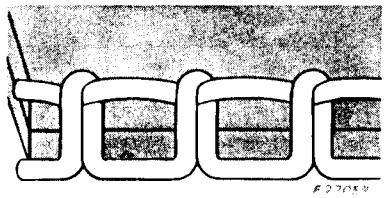


Fig. 12. Cross Section View of Lock Stitch with Tight Needle Thread Tension

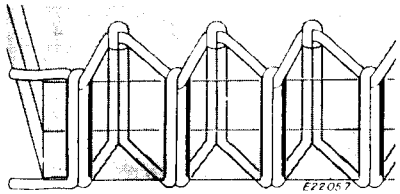


Fig. 13. View of Zigzag Lock Stitch with Tight Needle Thread Tension

When the **tension of the needle thread is set TOO LOOSE in relation to the bobbin thread**, insufficient bobbin thread is drawn into the material and the bobbin thread may lie straight along the underside of the material, as shown in **Figs. 14** and **15**, below.

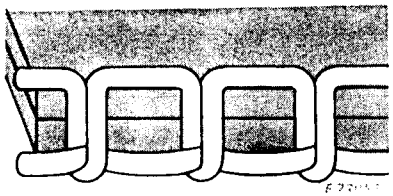


Fig. 14. Cross Section View of Lock Stitch with Loose Needle Thread Tension

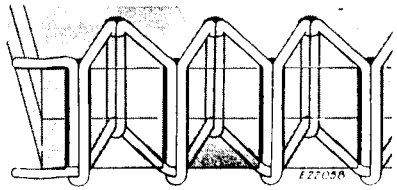


Fig. 15. View of Zigzag Lock Stitch with Loose Needle Thread Tension

Irregular stitching, such as is shown in **Figs. 16** and **17**, is usually caused by a **combination of two or more of the following conditions:**

a. Too loose or too tight needle thread tension.
b. Too loose or too tight bobbin thread tension.
c. Damaged or improperly set tension spring on bobbin case.
d. Worn or damaged position finger.
e. Bent needle or damaged needle eye.
f. Improper feeding of material.
g. Use of wrong needle and thread combination.
h. Use of rough or damaged thread.

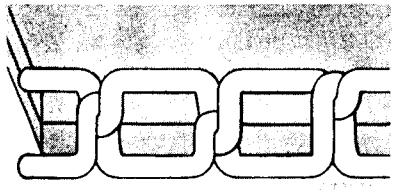


Fig. 16. Cross Section View of Irregular Lock Stitch

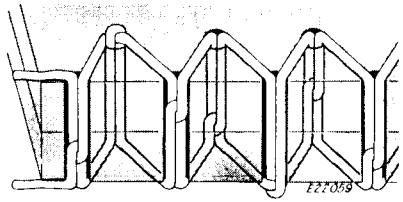


Fig. 17. View of Irregular Zigzag Lock Stitch

TENSION CONDITIONS

Fig. 18. Exploded View of Needle Thread Take-up Spring Assembly

When checking and adjusting machine for tension conditions in relation to perfect sewing, use a Size 14 needle and #70 cotton thread. Make sure that the presser foot is down.

Test the machine at the following settings:

1. Straight sewing at left-hand position of needle and at both longest and shortest stitch settings.
2. Maximum zigzag stitching at extreme left-hand position of needle and at both longest and shortest stitch settings.

CAUTION: When the machine is received from the factory the sewing hook and the tension parts must be cleaned thoroughly, removing all traces of the tacky anti-rust oil with which these polished surfaces are covered. (See instructions on inside front cover.) Failure to wash the hook with Varsol and to oil it after cleaning, may result in many forms of looping trouble.

A tight fitting hook (see pages 34 and 35) or a dry hook may cause loose stitching as well as various types of loops on the underside of the material.

Some of the irregularities of needle thread and bobbin thread tensions are listed on the following page, together with the causes of trouble and the remedies:

TENSION CONDITIONS	CAUSES	REMEDIES
Irregular setting of stitches with large beads showing on the underside of the fabric.	Needle too small for size of thread.	Use correct needle. (See page 5.)
	Too little needle thread tension.	Increase upper tension.†
	Faulty take-up spring action.	Check stroke of spring—replace if necessary. (See page 13.)
	Clogged or sticky sewing hook.	Free hook of any threads, gum or other foreign matter. If necessary replace hook and bobbin case holder.
	Insufficient thread space.	Provide 1/64 inch thread space between bobbin case holder and position finger. (See page 37.) Inspect finger for roughness.
Fabric drawing on open zigzag stitch of medium stitch length.	Needle thread tension too tight.	Reduce tension.†
	Pressure on take-up spring is too great.	Reduce pressure on take-up spring. (See page 13.)
Fabric drawing on all short zigzag stitching from medium to maximum bight.	Needle thread tension too tight.	Reduce tension† so that material is not drawn yet stitch lies flat. Underside stitching will not lock in corners but in between needle perforations.
Material drawing when sewing with Silk, Nylon or Dacron threads.	Upper tension too tight.	Tension **must be lighter** for synthetic threads than for cotton. Reduce tension.†
Machine skipping at extreme left bight position when sewing with Silk or Nylon threads.	Material may be flagging with needle. Needle may be bent or setting too high.	Use a solid foot in place of a hinged foot. Replace needle. Check height of needle bar in relation to hook. (See page 37.)

† All tension corrections (see bottom of page 13) are made on the needle thread tension assembly, in relation to the bobbin thread tension, on the assumption that the bobbin thread tension is correctly set at the factory and should not be unnecessarily disturbed.

TO ADJUST THE NEEDLE THREAD TAKE-UP SPRING

Stroke of Spring:

When the top of the eye of the needle reaches a point 1/16 inch above the material on downward stroke, take-up spring **A, Fig. 19** should finish its action on the thread and rest against the stop, **B, Fig. 19** on spring regulator.

To set take-up spring stroke, loosen set screw **C, Fig. 20** and turn tension stud **D, Figs. 19** and **20** clockwise to complete its action later, or counterclockwise to complete its action earlier. Then securely tighten set screw **C.**

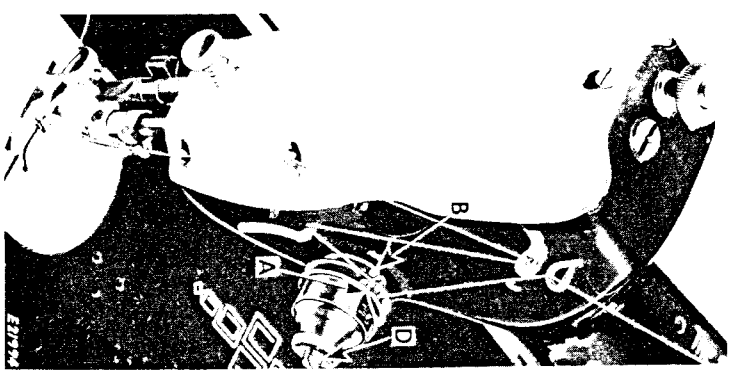


Fig. 19. Action of Take-up Spring Completed

Pressure of Spring:

Tension on thread take-up spring **A** should be just sufficient to take up the slack of needle thread until needle eye reaches the material in its descent.

To adjust, loosen tension stud set screw **C** and force take-up spring **A** from its recess at **B, Fig. 19** in regulator over to the right, between the regulator and the tension discs, to increase the tension, as shown in **Fig. 20,** or over to the left to decrease the tension. Then while maintaining pressure adjustment of spring, securely tighten set screw **C** and return spring **A** to its recess at **B.**

Tension of Spring:

The tension on needle thread can be regulated only when the presser foot is down. **To increase tension,** turn thumb nut **T4, Fig. 20** gradually to right (clockwise) until required tension is obtained. **To decrease tension,** turn the thumb nut **T4** gradually to the left (counterclockwise) until required tension is obtained.

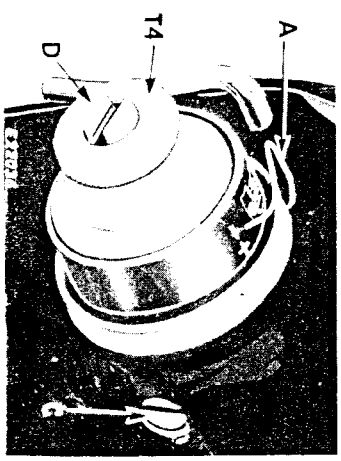


Fig. 20. Adjusting Take-up Spring

SUGGESTIONS TO THE SERVICEMAN IN THE HOME

Quite frequently, when a machine is not sewing satisfactorily, the required adjustments can be accomplished in the home by a SINGER Serviceman.

Conditions such as faulty operation of the bight control or worn or damaged parts may have to be remedied at the SINGER Shop, but this decision should be made only after the machine is thoroughly checked in the exact order outlined below.

ORDER OF INSPECTION IN THE HOME:

1. Inspect recent samples of sewing made by the customer on the machine, before checking machine itself.

2. Check the combination of needle and thread used by customer. (See Page 5.)

3. Check needle for—

   a. wear or damage (needle blunt, bent or burred),

   b. position in needle clamp (See page 7),

   c. location in relation to throat plate, presser foot and sewing hook. (See instructions on pages 28 to 31.)

4. Check tensions of both threads. (See pages 9, 10, 11.)

5. Inspect needle thread take-up spring settings. (See page 13.)

6. Check threading of machine, both upper and under threads. (See Form 20616, Instructions for Using Machine 206K25.)

7. Inspect wound bobbins for proper winding. (See pages 38 and 39.)

8. Check performance of bight control mechanism. (See pages 15 to 19.)

9. Check timing of needle bar and sewing hook during straight stitching. (See pages 35 to 37.)

10. Check location of position finger in bobbin case base. (See page 37.)

BIGHT

In this manual, the width of the zigzag movement of the needle, while stitching, is termed the **BIGHT** (see **Figs. 21** to **25**). The mechanism, in the upright part of the machine arm, which controls the width and the position of the bight is called the **BIGHT CONTROL.**

The width of bight is sometimes referred to as the "swing of the needle" or the "needle vibration."

The sidewise position of the needle during straight or zigzag stitching is determined by the setting of the **NEEDLE BAR POSITION LEVER G, Fig. 26.**

The width of the bight is determined by the setting of the **BIGHT CONTROL LEVER E, Fig. 26.**

STITCHING AT VARIOUS WIDTHS OF BIGHT

SETTINGS ON BIGHT CONTROL SCALE	"0"	#1	#2	#3	#4
APPROXIMATE INCH	0	3/64	3/32	9/64	3/16
SAMPLE OF STITCHING (actual size)	ZERO BIGHT				MAX. BIGHT
	Fig. 21	Fig. 22	Fig. 23	Fig. 24	Fig. 25

When the bight control lever **E, Fig. 26** is at its **lowest position,** the machine is set at **ZERO BIGHT** and should perform **straight stitching** only, as shown in **Fig. 21.**

When the bight control lever **E,** is at its **highest position,** the machine is set at **MAXIMUM BIGHT** and should perform zigzag stitching approximately 3/16 inch wide, as shown in **Fig. 25.**

The bight control lever **E** may also be set at positions #1, #2 or #3 on the BIGHT CONTROL SCALE **F, Fig. 26;** thus setting the width of bight to one of those shown in **Figs. 22, 23** or **24,** respectively.

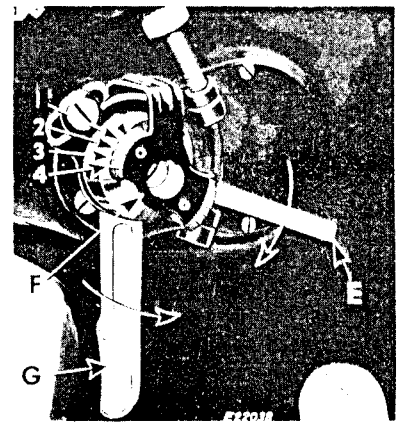


Fig. 26. Bight Control Mechanism (straight stitching)

VARIETIES OF STITCHING AND SUMMARY OF CONTROLS OBTAINABLE FROM BIGHT CONTROL MECHANISM

No. 1. STRAIGHT STITCH, CENTRAL POSITION

SETTINGS: Bight control lever **E** at **lowest** point (ZERO BIGHT) and position lever **G** at **lowest** point (CENTRAL POSITION), as shown in **Fig. 26**, page 15.

STITCHING: Straight stitching **midway between two extremes of maximum bight**, as shown in **Fig. 27**, at right.

CAUTION: A machine equipped with **straight stitching** throat plate and presser foot **must always be set as described above** (see also **Fig. 26**).

However, this type of stitch as well as all of those listed below and on pages 17 and 18 can be accomplished on a machine equipped for zigzag stitching.

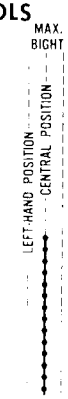


Fig. 27

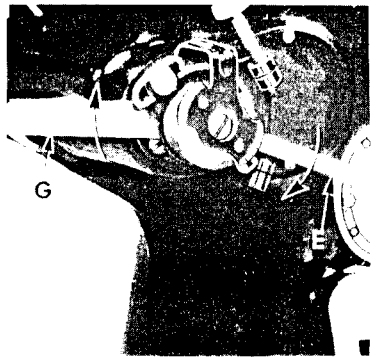


Fig. 28

No. 2. STRAIGHT STITCH, LEFT-HAND POSITION

SETTINGS: Bight control lever **E** at **lowest** point and position lever **G** at **highest** point, as shown in **Fig. 28.**

STITCHING: Straight stitching at the **extreme left-hand** position of the needle. As shown in **Fig. 29.**

Fig. 29

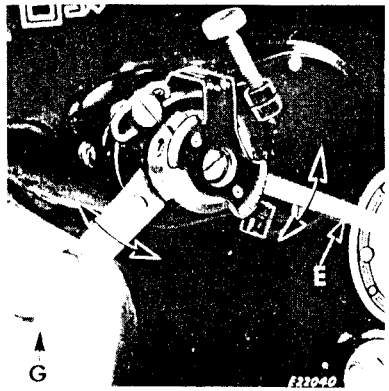


Fig. 30

No. 3. STRAIGHT STITCH BETWEEN LEFT AND CENTRAL POSITION

SETTINGS: Bight control lever **E** at **lowest** point and position lever **G** at any one of the **infinite settings between the central and the left-hand** positions of the needle, as shown in **Fig. 30.**

STITCHING **See Fig. 31:** Straight stitching on one of the infinite lines between the ex-

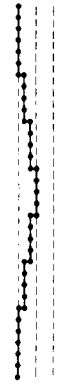


Fig. 31

treme left and center positions of the needle. These last two types are frequently used during ornamental stitching.

No. 4. MAXIMUM ZIGZAG STITCH, CENTRAL POSITION

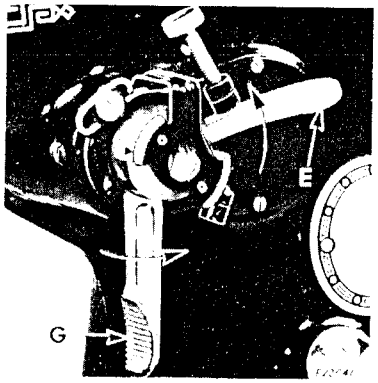


Fig. 32

SETTINGS: Bight Control lever **E** at **highest** point and position lever **G** at **lowest** point, as shown in **Fig. 32.**

STITCHING: Zigzag stitching performed at the maximum width possible, the needle swinging equally to the right and to the left of the central needle position, as shown in **Fig. 33.**

Fig. 33

No. 5. MAXIMUM ZIGZAG STITCH, LEFT-HAND POSITION

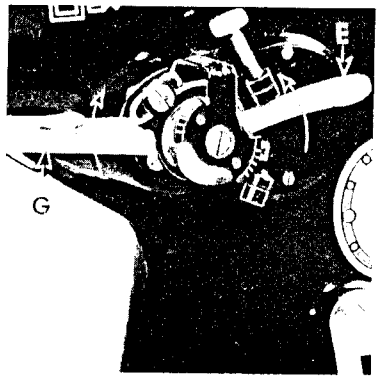


Fig. 34

SETTINGS: Bight control lever **E** at **highest** point and position lever **G** at **highest** point, as shown in **Fig. 34.**

STITCHING: Zigzag stitching performed at the maximum width possible, the needle swinging from the extreme left hand position toward the extreme right, as shown in **Fig. 35.**

Fig. 35

NOTE: When the bight control lever **E** is set at maximum bight, as described in the last two types of stitching, the **appearance** of the stitching **should remain the same** whether position lever **G** is set at its **highest** or **lowest** point or at any other setting in between these extremes. Compare the stitching in **Figs. 33** and **35.**

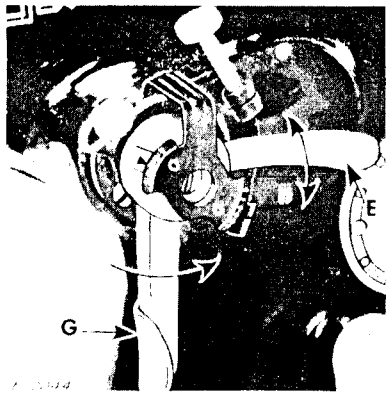


Fig. 36

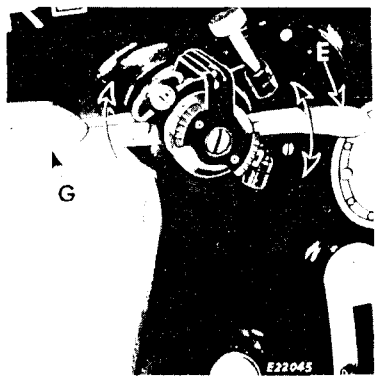


Fig. 38

No. 6 ZIGZAG STITCH OF VARIOUS WIDTHS, CENTRAL POSITION

SETTINGS: Bight control lever **E** at any desired setting **between lowest and highest** point and position lever **G** at **lowest** point, as shown in **Fig. 36.**

STITCHING: Zigzag stitching performed at width desired up to maximum bight, the needle swinging equally **to the right and to the left of the central position.** Variations of this stitching are shown in **Fig. 37.**

Fig. 37

No. 7. ZIGZAG STITCH OF VARIOUS WIDTHS, LEFT-HAND POSITION

SETTINGS: Bight control lever **E** at any desired setting **between lowest and highest** point and position lever **G** at **highest** point, as shown in **Fig. 38.**

Fig. 39

STITCHING: Zigzag stitching performed at width desired up to maximum bight, the needle swinging from the extreme left toward the right. Variations of this stitching are shown in **Fig. 39.**

No. 8. ZIGZAG STITCH OF VARIOUS WIDTHS AND AT VARIOUS POSITIONS OF THE NEEDLE

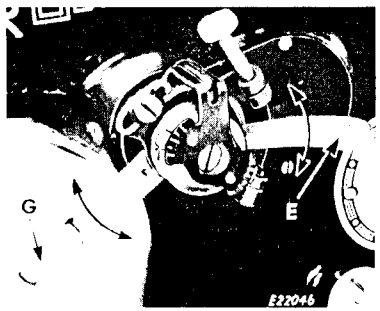


Fig. 40

SETTINGS: Bight control lever **E** and position lever **G at any position between highest** and lowest point, as shown in **Fig. 40.**

STITCHING: Zigzag stitching performed at width desired up to maximum bight, the needle swinging from

Fig. 41

various positions at the left of the central position toward the right. An example of this very irregular zigzag stitch is shown in **Fig. 41.**

TO REMOVE THE BIGHT CONTROL MECHANISM

To remove the bight control mechanism, set bight control lever **E** and position lever **G**, at lowest point, as shown in **Fig. 42**, loosen two screws **H, Fig. 42** and slide entire assembly out of machine arm.

If necessary, the mechanism may be disassembled, as illustrated in **Fig. 43.**

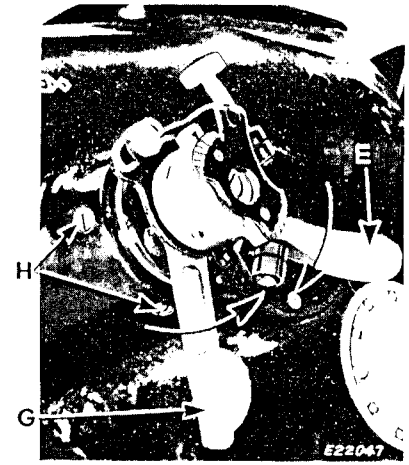


Fig. 42. Removing Bight Control Mechanism

TO REPLACE THE BIGHT CONTROL MECHANISM

The bight control mechanism should be assembled as illustrated in **Figs. 43** and **44**, bearing in mind the following facts.

Stop pin **P, Fig. 43**, on the bight control lever **E** must lie **outside** spring **Q, Fig. 43** in the assembled device.

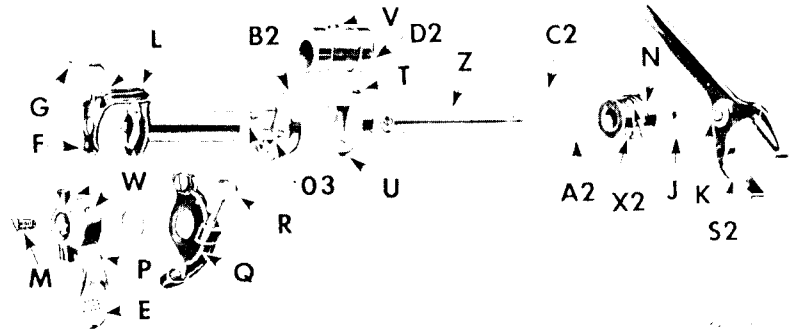


Fig. 43. Exploded View of Bight Control Mechanism

When the bight control mechanism is assembled, as shown in **Fig. 44**, tighten screw **M, Fig. 45**, which regulates compression of spring washer **A2, Fig. 43**, page 19, just enough to allow operation of levers **E** and **G, Fig. 45** without shifting during sewing.

Turn set screws **T, Fig. 45** and **U, Fig. 44** inward, flush to outer surface of sleeve **B2, Fig. 44.**

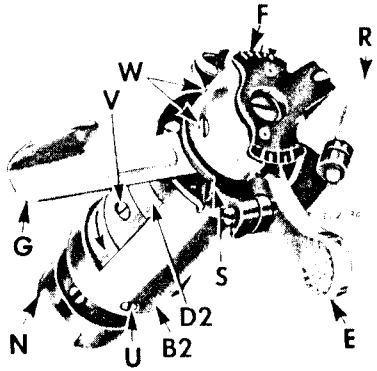


Fig. 44. Rough Adjustment of Bight Control Mechanism

Turn eccentric **D2, Fig. 44** as far as possible in the direction of arrow. Move position lever **G** downward until it clears the stop **S, Fig. 44** by approximately 1/32 inch. Then securely tighten set screws **T, Fig. 45** and **V, Fig. 44.**

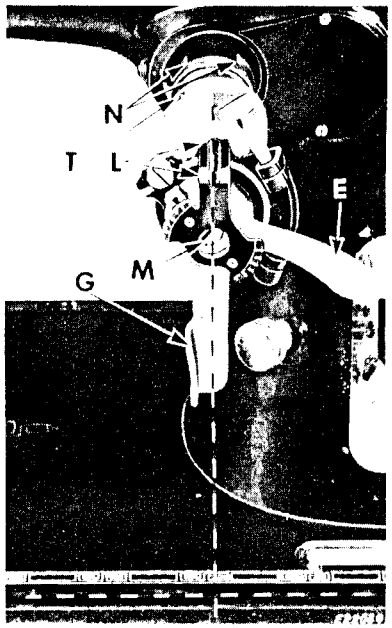


Fig. 45. Setting of Bight Control Mechanism During Installation

Move position lever **G** to its highest point and securely tighten set screw **U, Fig. 44.**

Move levers **E** and **G** to their lowest points and rotate slideway **N, Fig. 45** until it is parallel to a line through the centers of the bight control scale bridge **L**, adjusting screw **M** and position lever **G**, as shown in **Fig. 45.** Securely tighten set screws **W, Fig. 44.**

Replace stud **K** in connection fork **S2**, as shown in **Fig. 43, page 19** and place slide block **J, Figs. 43** and **46** on stud **K.**

Hold bight control mechanism so that the line through the centers of the bridge **L**, adjusting screw **M** and position lever **G**, described above is approximately perpendicular (⊥) to the bed of the machine as shown in **Fig. 45**, and slide the entire assembly into the arm of the machine.

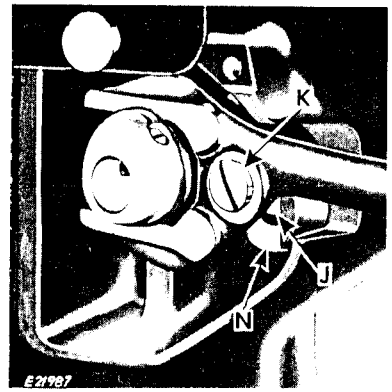


Fig. 46. Vibrator Fork Connection and Regulating Slide Block

Make sure that slide block **J** slips into slideway **N, Fig. 46.** Tighten stud **K, Fig. 46.** Then securely tighten set screws **H, Fig. 47.**

TO ADJUST THE BIGHT CONTROL MECHANISM AT ZERO BIGHT (STRAIGHT STITCHING)

When the machine is set at zero bight, with bight control lever **E, Fig. 47** at lowest point, there should be no motion of the vibrating needle lever **E2, Fig. 48** and therefore no zigzag movement of the needle.

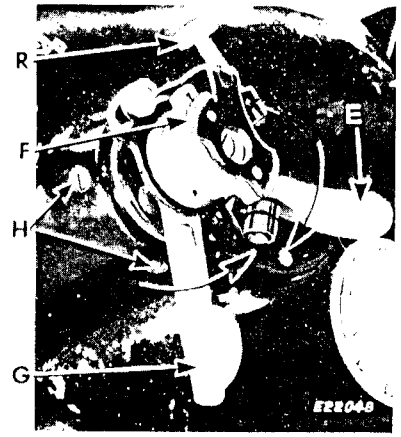


Fig. 47. Adjusting Zero Bight

Radial Adjustment For Zero Vibration During Straight Sewing

To adjust position of bight control mechanism at zero bight (removing all vibration of the needle during straight sewing), loosen set screws **H, Fig. 47** and turn entire mechanism clockwise or counterclockwise as required.

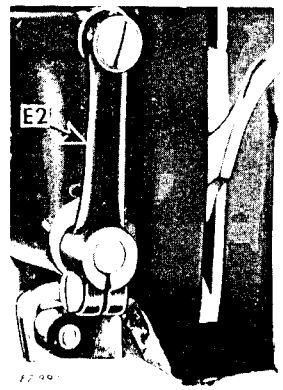


Fig. 48. Vibrating Needle Lever

NOTE: If **all** vibration of the needle, during straight sewing, cannot be eliminated by a **slight radial adjustment** as described above, return the mechanism to the perpendicular (⊥) position, as instructed in last paragraph on page 20, and check entire bight control mechanism as instructed in the following pages.

TO CHECK OPERATION OF BIGHT CONTROL MECHANISM
(Using Needle-Perforation Test)

The adjustments of the bight control mechanism discussed below, and on the following pages, should be checked by means of **needle-perforation tests.**

After removing presser foot and placing a sheet of notepaper over the throat plate, turn the machine pulley forward until needle makes a slight perforation in the paper, then backward until another perforation is made; repeating this operation for each test required, as instructed below and on pages 23 to 27.

To insure an accurate reading during these tests, the perforations should be as small as possible—the needle barely pricking the paper at each test position. If it is possible to use a Size 7 needle the machine pulley may be turned **always over toward the operator** throughout the tests, eliminating possible error due to end play or looseness in linkage from the arm shaft to the needle.

It is also important to the accuracy of these tests that the paper should be held securely under the needle against the movement of the feed dog and in such a way that it will not move in any direction throughout each complete test.

NOTE: The exact position of the needle relative to the needle hole in the throat plate, at this stage is, of no importance, since the bight control operation must be correctly adjusted before any other adjustment of the needle location can be made. However, if the needle should strike the throat plate during these tests, either the adjuster is rotating the slideway **N, Fig. 46,** in the wrong direction, or the small vibrating needle lever **E2** and needle bar holder **H2, Fig 49,** are in need of adjustment. Loosen clamping screw **F2, Fig. 49** and move holder **H2,** toward right or left as required. Then securely tighten screw **F2.**

Before checking the bight control mechanism, back off the limit screw **R, Fig. 50** so that the bight control lever **E,** at its highest position, will contact the limit screw **boss** only, instead of the screw.

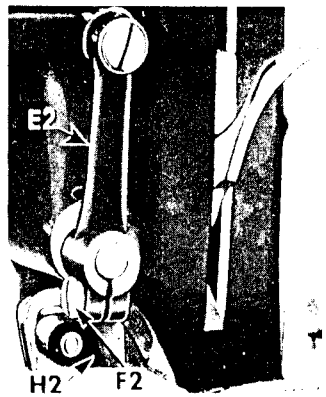
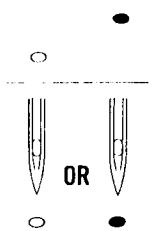


Fig. 49. Vibrating Needle Lever

In the following illustrations, such as in **Fig. 51,** page 23, the perforations made by the needle at specific settings of the bight control mechanism are indicated as follows:



Perforation made by needle at central position

Perforation made by needle at left-hand position

Perforation made by needle during straight sewing

The lines of stitching, such as shown in **Fig. 52**, are indicated as follows:

Line of stitching made at **central** position of needle.

Line of stitching made at **left-hand** position of needle.

Line of stitching made at central position **coinciding** with line of stitching made at left-hand position.

TO ADJUST THE CENTRAL SETTING OF THE NEEDLE
(Straight Stitching)

The bight control mechanism must be adjusted so that when the position lever **G** is moved to its lowest (central) setting and the bight control lever **E** to its lowest (zero bight) position, as shown in **Fig. 50,** the machine will perform straight stitching midway between the two extremes of maximum bight. (See **Fig. 52.**)

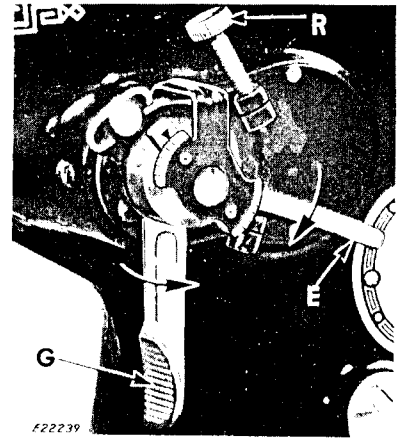


Fig. 50 Lever Settings—
Straight Stitching at Central Position of Needle

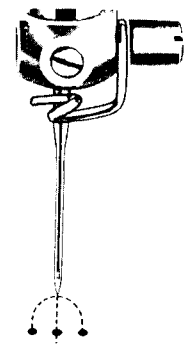


Fig. 51
Needle Perforation Test

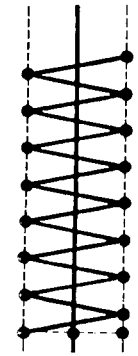


Fig. 52
Sample of Stitching

(Straight Stitching and Maximum Zigzag Stitching at Central Position of Needle)

To centralize the zero bight position between the two extreme positions of maximum bight, remove the presser foot, set bight control lever **E, Fig. 50** at **highest** (maximum bight) position and position lever **G, Fig. 50** at its **lowest** (central) setting.

Then place a piece of paper over the throat plate and by means of the needle-perforation test, described on page 22, establish the two extreme positions of the needle at this setting. Then move the bight control lever **E, Fig. 50** to its lowest (zero bight) position, as shown in **Fig. 50,** and make the single perforation of the needle representing straight stitching at central setting, as shown in **Fig. 51.** This perforation should be midway between the other two.

NOTE: When the above setting has been correctly adjusted there will be **no vibration of the needle bar** during straight sewing. (See page 21.)


Fig. 53

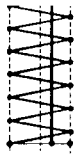


Fig. 54


Fig. 55

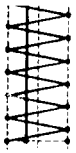


Fig. 56

If this single perforation is **nearer** to the **right-hand** perforation made at maximum bight setting, as shown in **Figs. 53** and **54**, remove bight control mechanism from machine and, raising position lever **G, Fig. 57** slightly, screw the upper set screw **T, Fig. 57** inward. Replace mechanism and recheck.

If this single perforation is **nearer** to the **left-hand** perforation made at maximum bight setting, as shown in **Figs. 55** and **56**, remove mechanism and, raising position lever slightly, screw upper set screw **T, outward.** Replace bight control mechanism and recheck.

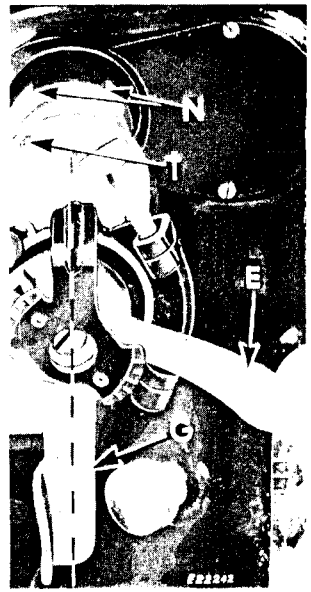


Fig. 57. Adjustment for Straight Stitching Central Setting

NOTE: Each time that the bight control mechanism is replaced in machine, it must be adjusted at zero bight, as instructed on page 21.

TO COORDINATE CENTRAL AND LEFT-HAND SETTINGS OF THE NEEDLE DURING ZIGZAG STITCHING

The bight control mechanism should be now adjusted so that the two extreme positions of the needle, at maximum bight and **central** setting **coincide** with the two extreme positions of the needle at maximum bight and **left-hand** setting, as shown by the sample of stitching in **Fig. 58.**

Check the two extreme positions of the needle at maximum bight, by means of the needle-perforation test, first with the position lever at its lowest (central) setting and then with the position lever at its highest (left-hand) setting, as shown in **Fig. 59.** The two extreme positions of the needle at left-hand setting should respectively coincide with the two extreme positions of the needle at central setting.

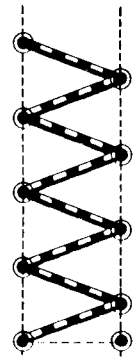


Fig. 58
Coordination

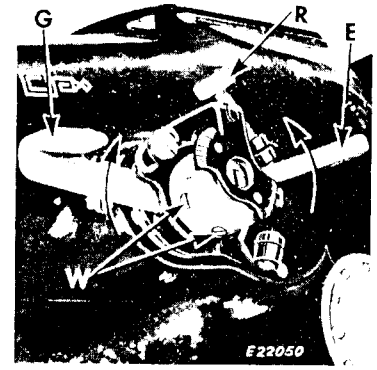


Fig. 59
Lever Settings—
Maximum Zigzag at
Left-hand Position
of Needle

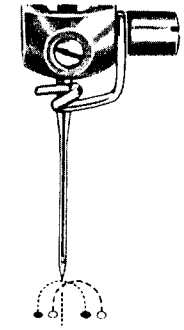


Fig. 60
Needle Perforation
Test

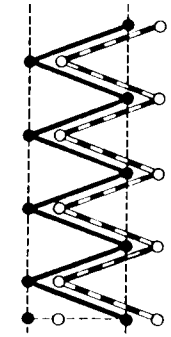


Fig. 61
Sample of
Stitching

(Showing Line of Zigzag Stitching made at Left Hand Position of Needle, to the Right of Line of Zigzag Stitching made at Central Position of Needle.)

If the two perforations made at left-hand setting of the position lever are to the right of the perforations made at central setting, as shown in **Figs. 60** and **61** hold bight control lever **E,** securely, at maximum bight and position lever at its highest position, as shown in **Fig. 59,** while loosening screws **W, Fig. 59,** on hub of bight control lever and rotating slideway **N, Fig. 62,** at rear of machine over toward machine pulley to a position where the needle perforations coincide. Then securely tighten screws **W** and recheck.

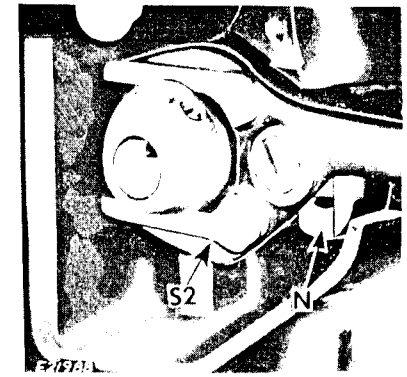


Fig. 62. Needle Vibrator Slideway

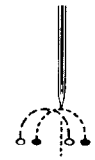


Fig. 63

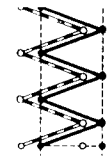


Fig. 64

If the two perforations made at left-hand setting are to the **left** of the two perforations made at central setting, as shown in **Figs. 63** and **64,** hold bight control lever **E,** securely, at its highest position, while loosening the two screws **W** and rotating the slideway **N** over away from the machine pulley to a position where the needle perforations coincide. Then securely tighten the two screws **W** and recheck.


Fig. 65

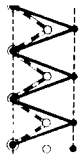


Fig. 66

It may be found that **only one** of the two extreme positions of the needle at one setting **coincides** with its respective needle position at the other setting, while the opposite extreme position does not, as shown in **Figs. 65** and **66.** This variation, which will be slight when it does exist, is permissible and no further adjustment is necessary.

NOTE: Coordination of the two positions of the needle at central and left-hand settings can be **tested** also by setting the bight control lever at maximum bight and, moving the position lever several times between its highest and lowest points, while watching the vibrator fork connection **S2, Fig. 62,** page 25, in the rear of the machine. There will be no movement whatsoever of the vibrator fork connection **S2** during this test, if the bight control is properly adjusted. **Adjustment** is accomplished in the same manner as instructed on page 25.

When these two settings of the bight control mechanism are coordinated, recheck and adjust the position of the needle at zero bight as described on page 21.

TO ADJUST THE LEFT-HAND SETTING OF THE NEEDLE (Straight Stitching)

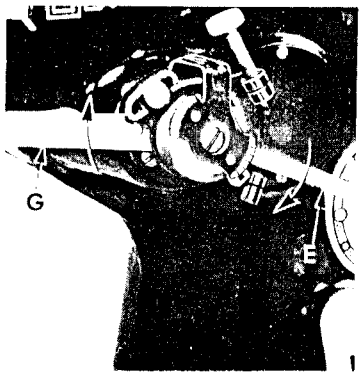


Fig. 67
Lever Settings—
Straight Stitching at Left-Hand Position of Needle

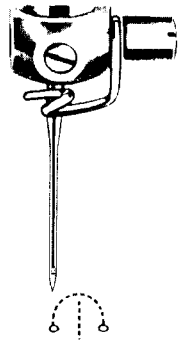


Fig. 68
Needle Perforation Test

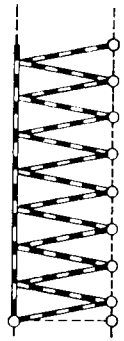


Fig. 69
Sample of Stitching

(Straight Stitching and Maximum Zigzag Stitching at Left-Hand Position of Needle.)

The bight control mechanism must be adjusted so that when the bight control lever **E, Fig. 67,** is moved to its lowest (zero bight) position and the position lever **G, Fig. 67,** to its highest (left-hand) setting, as shown in **Fig. 67,** the machine will perform straight stitching at the extreme left-hand position of the needle at maximum bight as shown in **Figs. 68** and **69.**

To check whether the zero bight (straight stitching) position coincides with the extreme left-hand position of the needle at maximum bight, move bight control lever **E** to its highest (maximum bight) position and position lever **G** to its highest (left-hand) setting. Place a piece of note-paper over the throat plate and, by means of the needle-perforation test described on page 22, establish the two extreme positions of the needle at this setting. Then move the bight control lever **E** to its lowest (zero bight) position, as shown in **Fig. 70,** and make the single perforation of the needle, representing straight stitching at left-hand setting.

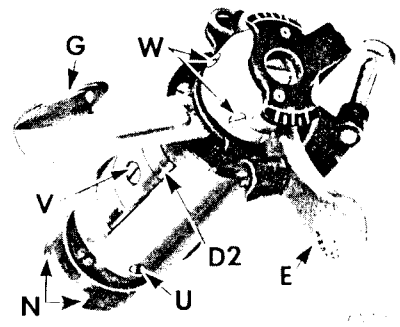


Fig. 70. Adjustment for Straight Stitching, Left-Hand Setting


Fig. 71

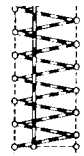


Fig. 72

If the single perforation made at zero bight, is to the **right** of the left-hand perforation made at maximum bight as shown in **Figs. 71** and **72,** remove bight control mechanism and screw the lower set screw **U, Fig. 70** outward. Replace mechanism and recheck.

If the single perforation is to the **left** of the left-hand perforation made at maximum bight, as shown in **Figs. 73** and **74** remove bight control mechanism and screw the lower set screw **U, Fig. 70** inward. Replace the bight control mechanism in the machine, adjust for zero bight, as instructed on page 21 and recheck left-hand setting.

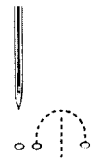


Fig. 73

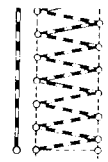


Fig. 74

CAUTION: After each adjustment involving regulating slideway **N, Fig. 70,** eccentric sleeve **D2** and hub screws **W, Fig. 70** or stop screws **U** and **V, Fig. 70,** all positions of the needle determined by the operation of the bight control mechanism must be rechecked, as it is quite possible, while correcting one, to over-correct another previously made adjustment.

TO ADJUST THE LENGTHWISE POSITION OF THE NEEDLE IN RELATION TO STRAIGHT-STITCHING THROAT PLATE AND PRESSER FOOT

(Machine Set for Straight Stitching at Central Position)

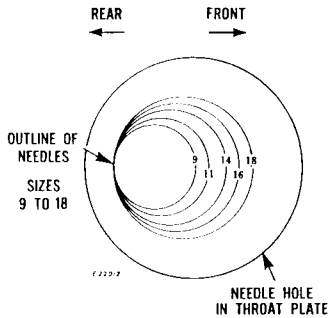


Fig. 75. Needle Hole in Straight-Stitching Throat Plate

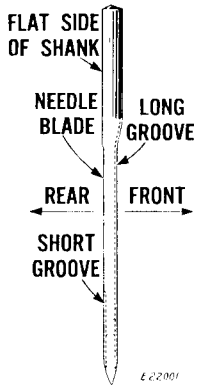


Fig. 76
206 x 13 Needle

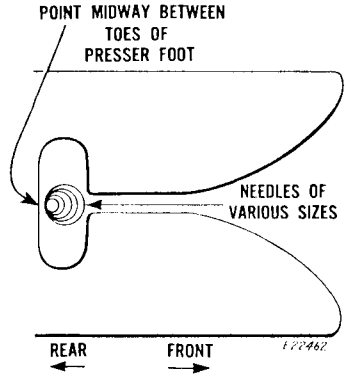


Fig. 77
Straight Stitching Presser Foot

When the needle enters the needle hole in straight-stitching throat plate, the short-groove (flat-shank) side of the needle should be close to the **rear** edge of the needle hole, as illustrated in **Figs. 75** and **76.**

When the needle is at its lowest position, the short-groove (flat-shank) side of the needle should be at the **rear** of the needle close to a point on the straight-stitching presser foot **midway** between the toes of the presser foot, as illustrated in **Figs. 76** and **77.**

At no time should the needle touch the edge of the needle hole. The needle should never strike the presser foot.

This setting is necessary to permit an **increase** in the diameter of the needle blade **toward the front** without disturbing the proper relationship between the needle and the sewing hook. This setting will also maintain sufficient clearance for the needle thread.

If the needle is incorrectly located **lengthwise** in the throat plate hole:

The needle or the needle bar may be bent,
The needle seat in the needle bar may be clogged with dirt or be damaged, or
The throat plate may be incorrectly seated.

If the needle strikes the presser foot, any of the above conditions may be at fault, or:

The presser bar may be bent, damaged or turned out of position,
The presser foot may be improperly seated on the presser bar,
The presser foot may be bent.

TO ADJUST THE SIDEWISE POSITION OF THE NEEDLE IN RELATION TO STRAIGHT-STITCHING THROAT PLATE AND PRESSER FOOT

(Machine Set for Straight Stitching at Central Position)

The needle bar holder **H2, Fig. 79** should be adjusted so that when the machine is set for straight stitching **at the central** position, as shown in **Fig. 78**, the **sidewise** position of the needle will be such that the needle will rise and fall centrally in the small needle hole of the throat plate designed for straight stitching and midway between the long and short toes of the straight stitching presser foot.

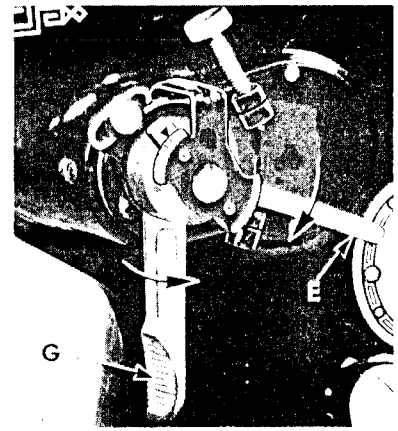


Fig. 78. Straight Stitching, Central Setting

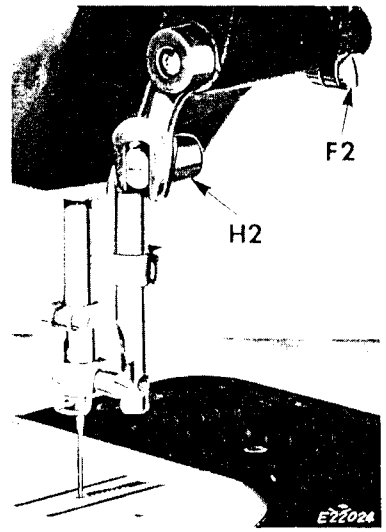


Fig. 79. Needle Bar Holder Adjustment on Needle Vibrator Lever

At no time should the needle touch the edge of the needle hole. The needle should never strike the presser foot.

To adjust **sidewise** position of needle, remove presser foot, move bight control lever **E** to zero bight and position lever **G** to its lowest (central) position, as shown in **Fig. 78.** Remove zigzag throat plate and replace with straight-stitching throat plate, shown in **Fig. 79.** Loosen clamping screw **F2, Fig. 79** and move needle bar holder as required to centralize needle sidewise in needle hole of throat plate, then securely tighten clamping screw **F2,** replace straight-stitching presser foot, and recheck.

NOTE: See instructions on page 28 for correct **lengthwise** position of the needle.

TO TIME THE PENDULUM MOVEMENT OF THE NEEDLE BAR

Set the bight control lever **E** at maximum bight and the position lever **G** at it lowest (central) setting as shown in **Fig. 80.**

While slowly turning the machine pulley over toward the operator, watch the movement of the small needle vibrator lever fork **J2, Fig. 81.**

Observe the following:

1. When the fork begins to move from one side to the other, the needle begins its pendulum movement.

2. The needle should reach the peak **M2, Fig. 82,** of its ascent, midway between the two extreme positions **P2, Fig. 82** of the needle.

3. When the needle vibrator lever fork **J2**, reaches the opposite end of its swing, the pendulum movement should be completed, as shown in **Fig. 82.**

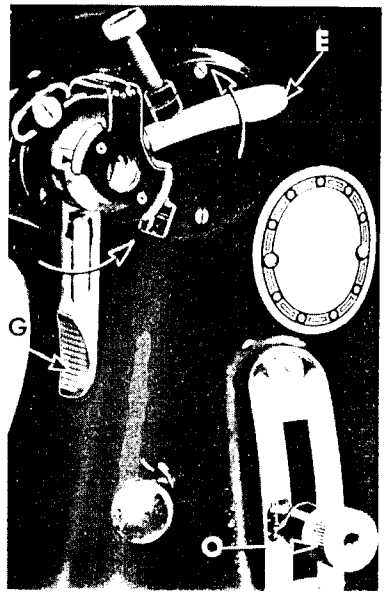


Fig. 80. Zigzag Stitching, Central Setting

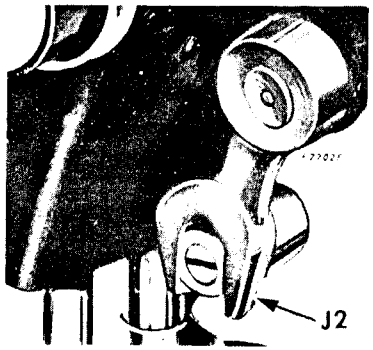


Fig. 81. Needle Vibrator Lever Fork

4. The needle should begin and end its pendulum movement at the **same height above the throat plate**, as shown in **Fig. 82.**

5. There should be no pendulum movement while the needle is in the material.

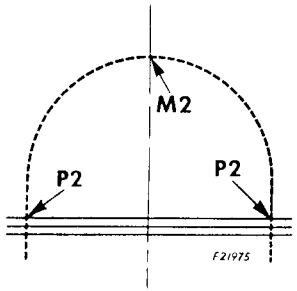


Fig. 82. Correct Path of Needle Pendulum Movement

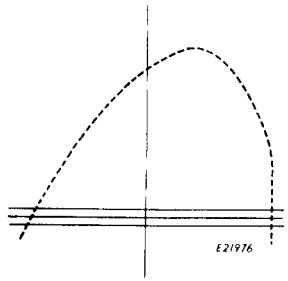


Fig. 83. Example of Incorrect Pendulum Movement

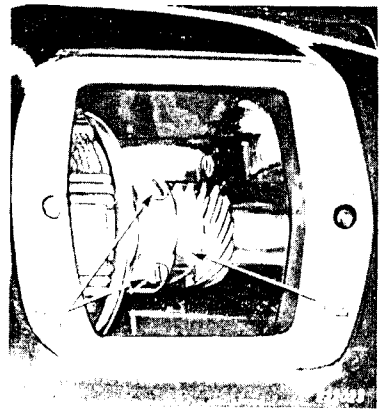


Fig. 84. Adjusting Needle Pendulum Movement

To adjust, loosen the two set screws **K2, Fig. 84** in the spiral gear **L2, Fig. 84** in the gear box on top of the machine and free the gear **L2** from the arm shaft.

Rotate the gear over toward the operator or over away from the operator as required and then securely tighten set screws **K2.** Recheck the pendulum movement.

TO SET THE FEED DOG AT THE CORRECT HEIGHT

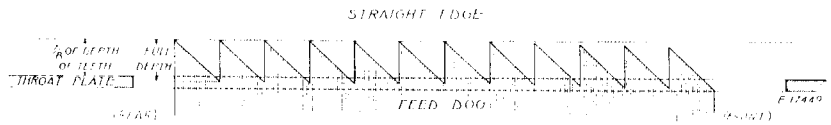


Fig. 85. Feed Dog at Correct Height

To check the height of the feed dog, set the stitch regulator **O, Fig. 80** for the longest stitch and turn the machine pulley over toward you until the feed dog is raised to its highest point. In this position seven-eighths of the depth of the **rear teeth** of the feed dog (approximately .038 inch) should project above the top surface of the throat plate, as shown in **Fig. 85.**

To adjust the height of the feed dog **N2, Fig. 86,** loosen clamping screw **F3, Fig. 86** and raise or lower the feed dog **N2,** as required. Then securely tighten clamping screw **F3.**

NOTE: The feed lifting eccentric **B3, Fig. 86** is not adjustable, as it is positively timed by location on a flat on the rotating hook driving shaft **C3.**

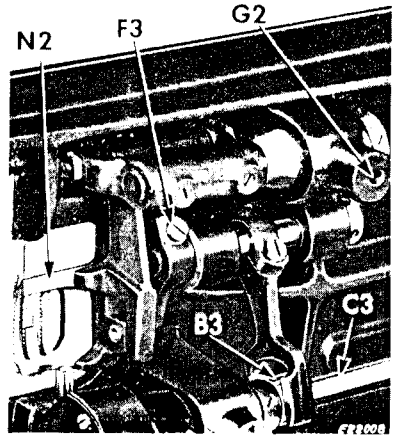


Fig. 86. Adjusting Height of Feed Dog

TO ADJUST THE POSITION OF THE FEED DOG IN RELATION TO THE THROAT PLATE SLOTS

SIDEWISE ADJUSTMENT:

The feed dog should be set in the feed dog slots in the throat plate so that it is as close as possible to the needle without touching the sides of the slots at any time, while the machine is set for straight stitching at central position and the stitch regulator is set for the longest stitch.

To adjust the **sidewise position** of the feed dog, loosen the small set screw **G2, Fig. 86**, page 31, and move the feed dog toward the left or right, as required. Then securely tighten the set screw **G2**.

CAUTION: To avoid binding of feed rock shaft connecting link **Q2, Fig. 87**, after adjusting **sidewise position** of the feed dog, loosen clamping screw **R2, Fig. 87** in the feed rock shaft crank and turn machine pulley over toward you several revolutions until the feed rock shaft crank and connecting link **Q2** ride freely. Then securely tighten the screw **R2**.

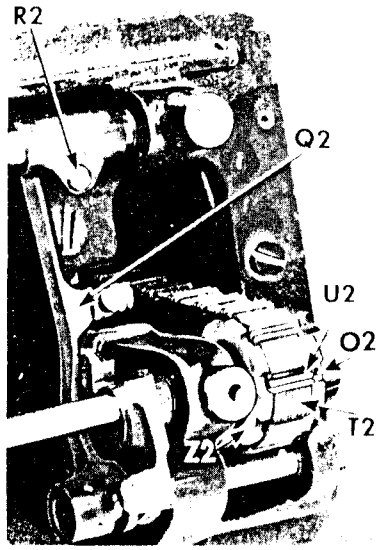


Fig. 87. Adjusting Feed Dog in Throat Plate Slots

LENGTHWISE ADJUSTMENT:

The feed dog should be set **lengthwise** in relation to the feed dog slots in the throat plate, so that its movement is equidistant from the front and rear ends of the slots while the machine is set for longest stitch.

To adjust the **lengthwise** position of the feed dog, set the machine for longest stitch. Loosen the screw **R2** and move the feed dog assembly toward the front or rear, as required. Then securely tighten the screw **R2**.

TO TIME THE FEED IN RELATION TO THE MOVEMENT OF THE NEEDLE

Feed timing should be checked with the stitch regulator set at longest forward stitch, needle set at straight sewing in central position and with the presser foot removed.

At this setting, the feed should stop its forward motion just after the needle thread take-up starts its downward motion after reaching its highest position.

A close inspection of the arm shaft connection belt **T2, Figs. 87** to **89**, will reveal that there are two sets **U2** and **V2**, of three metal clips, at opposite ends of the belt, each of which include one black metal clip and two copper clips, as shown in **Figs. 87** and **88.**

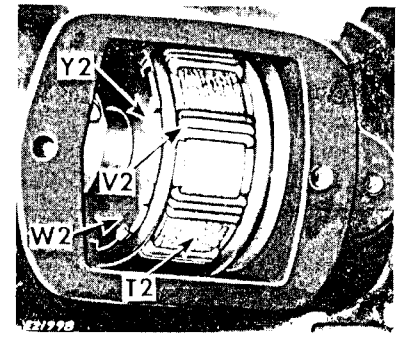


Fig. 88. Feed Timing Mark on Upper Sprocket

To time the feed in relation to the movement of the needle, turn the machine pulley over toward you until one of these sets of copper clips shown at **V2** in the belt **T2** lies in the groove stamped with the timing mark **Y2**, in the upper sprocket **W2, Fig. 88.**

Without disturbing the position of the belt on the upper sprocket remove and replace the belt **T2** on the lower sprocket **Z2, Fig. 89**, so that the other set of copper clips **U2** will be in the groove stamped with timing mark **O2** in the lower sprocket, as shown in **Fig. 87.**

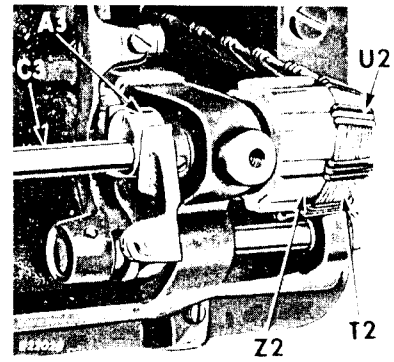


Fig. 89. Timing the Feed

Check the timing of the rotating hook in relation to the needle, as described on page 36.

TO REMOVE END PLAY OR BINDING IN ROTATING HOOK SHAFTS

There should be no end play or binding in the rotating hook driving shaft **C3, Fig. 90** or in the rotating hook shaft **J3, Fig. 91.**

To remove end play or binding in the hook driving shaft **C3**, loosen the two screws **E3, Fig. 90.** Push the feed lifting eccentric **B3, Fig. 90** sufficiently hard against the right end of the bushing **M3, Fig. 90** to remove end play without binding and securely tighten the two screws **E3**, making sure that the first of the two screws moving over toward you is on the flat of the hook driving shaft.

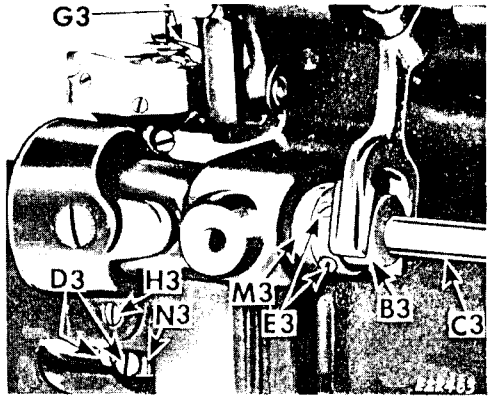


Fig. 90. Rotating Hook Driving Shaft

To remove end play or binding in the hook shaft **J3, Fig. 91,** first loosen the two screws **D3, Fig. 91,** push the adjusting collar **N3, Fig. 91** sufficiently hard against the hook shaft bushing to remove end play without binding and securely tighten the two screws **D3.**

Check the timing of the rotating hook, as instructed on page 36.

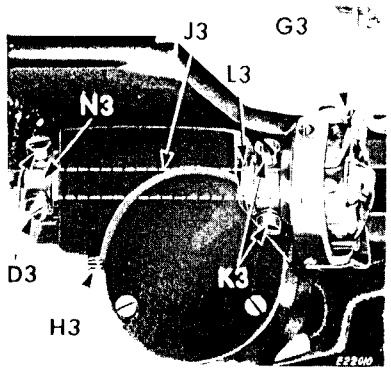


Fig. 91. Rotating Hook Shaft

TO SET THE POSITION OF HOOK POINT TO OR FROM THE NEEDLE

The point of the rotating sewing hook **G3,** must be set behind the needle and as close as possible to the needle without actually striking it, as shown in **Figs. 91** and **92.**

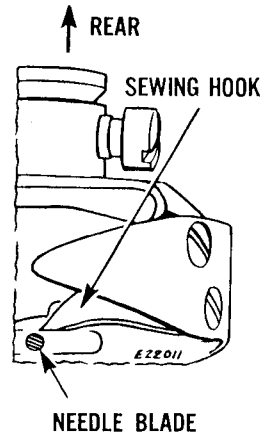


Fig. 92. Showing Relationship Between Rotating Hook Point and Needle

This setting is necessary to ensure uniform stitching and to prevent skipping of stitches or breaking of threads.

Before setting the hook point toward or away from the needle, remove all end play in the rotating hook shafts, as instructed on page 34.

Make certain that hub of rotating hook **G3** is hard against hub of gear **L3, Fig. 91.**

To adjust the position of the hook point **G3,** loosen the screw **H3, Figs. 90** and **91** and move the entire hook shaft assembly toward or away from the needle, as required. Then securely tighten set screw **H3.**

When it is found impossible to properly locate the hook point in relation to the needle by either of the methods described above, the following conditions may exist:

The needle or needle bar may be bent. (Replace.)

The needle seat in the needle bar may be burred. (Replace.)

The hook point may be damaged. (Replace.)

The needle may be improperly seated. (Reset.)

TO SET THE NEEDLE BAR HEIGHT INDICATOR

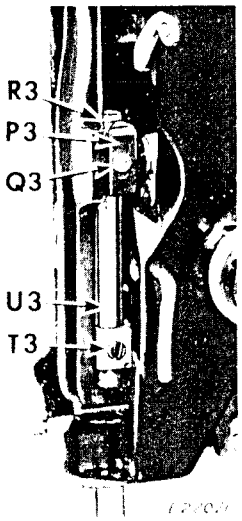


Fig. 93. Upper Timing Mark on Needle Bar

To set the needle bar height indicator, **P3, Fig. 93,** turn the machine pulley over toward the operator until the needle bar is at its lowest position. Loosen screw **Q3, Fig. 93** and move indicator **P3** up or down, as required, so that it corresponds with the **upper** timing mark **R3, Fig. 93.** Then securely tighten screw **Q3.**

TO TIME THE ROTATING HOOK IN RELATION TO THE MOVEMENT OF THE NEEDLE

NOTE: Before timing the hook, make sure that all hook shaft end play has been taken up (see page 34) and that the point of the hook is as close to the needle as possible without striking (see page 35).

To time the rotating hook in relation to the movement of the needle, set the needle bar height indicator **P3** as instructed above and set the machine for **straight stitching at central position.** Then turn machine pulley over toward the operator until the needle bar, reaching its lowest point, rises approximately 3/32 inch to the point where the needle bar height indicator **P3** corresponds with the **lower** timing mark **S3,** as shown in **Fig. 94.**

At this setting the point of the hook **G3, Fig. 95** must be at the center of the needle.

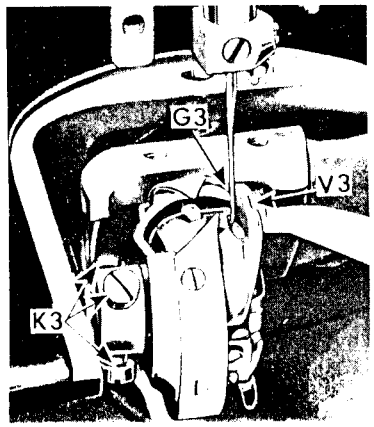


Fig. 95. Timing the Hook

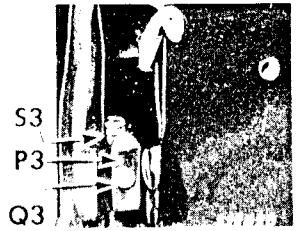


Fig. 94. Lower Timing Mark on Needle Bar

To time the hook loosen the three screws **K3, Fig. 95** and turn the hook as required. Maintaining this relationship, push the hook hub hard against the hub of the gear on the hook shaft, as instructed on page 34, and securely tighten the three screws **K3.**

TO SET THE NEEDLE BAR AT THE CORRECT HEIGHT

After timing the rotating hook in relation to the movement of the needle, as instructed on page 36, set the machine at straight stitching in central position and turn the machine pulley over toward the operator until the point of the hook **G3** is at the center of the needle, as shown in **Fig. 95.**

At this position the top of the needle eye must be approximately 1/16 inch **below** point of hook.

To adjust the height of the needle bar, loosen set screw **T3, Fig. 93** and move needle bar **U3, Fig. 93** up or down, as required. Then securely tighten screw **T3.**

NOTE: If difficulty, such as stitch skipping, is experienced when sewing on sheer fabrics or rubberized materials at **left hand position** of needle, set machine for **straight stitching** and turn the machine pulley over toward operator until the point of the hook is at the center of the needle. At this setting (left hand needle position), the point of the hook must be 1/64 inch above the top of the needle eye. Recheck this adjustment, for sewing qualities of work accomplished, during zigzag stitching at maximum bight and during straight sewing.

Check the setting of the needle bar height indicator **P3, Fig. 93** and reset, if necessary, as instructed on page 36.

ADJUSTMENT FOR THREAD CLEARANCE BETWEEN THE POSITION FINGER AND THE BOBBIN CASE BASE

The thread clearance between the position finger **X3, Fig. 96** and the bobbin case base **Y3, Fig. 96** must be set at approximately 1/64 inch, so that there is free passage for the upper and under threads while the loop of needle thread is being passed around the bobbin case, and also sufficient checking of the bobbin thread at the completion of each stitch. This clearance is also illustrated at **V3, Fig. 95.** To adjust the position finger for proper clearance, loosen the screw **W3** and move the finger toward the front or rear as required. then securely tighten screw **W3.**

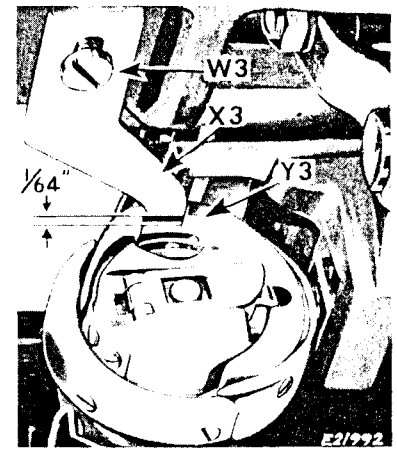


Fig. 96. Adjusting Position Finger

TO ADJUST THE STITCH REGULATOR

The distance between the stitches along the line of feed is termed the stitch length and is determined by the setting of the stitch regulator lever **O, Fig. 97** on the stitch indicator plate **Z3, Fig. 97.**

The divisions, #1 to #4 on the indicator plate **Z3** signify the stitch length in millimeters. Maximum stitch length (four millimeters) equals approximately 5/32 inch, or six stitches to the inch.

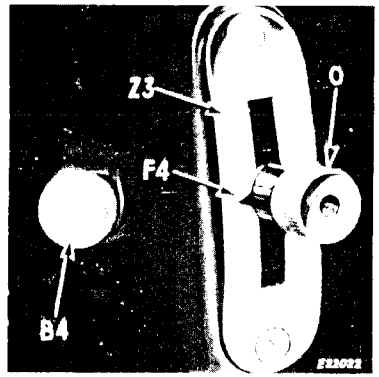


Fig. 97. Stitch Regulating Lever

The feed eccentric **A3, Fig. 98** is not adjustable for **length of stitch** as it is positively set at the factory by location on a flat on the rotating hook driving shaft **C3, Fig. 98.**

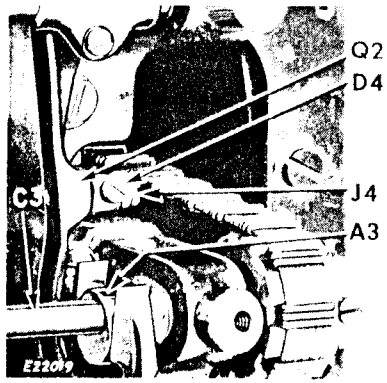


Fig. 98. Adjusting Stitch Regulator

When the index **F4, Fig. 97** on the stitch regulator lever **O** is set at zero on the indicator plate **Z3**, as shown in **Fig. 97**, there must be no forward or reverse movement of the feed.

To adjust the zero position of the stitch regulator, set the stitch regulator index **F4** at zero and tighten feed regulator stop screw **B4, Fig. 97.** Loosen set screw **D4, Fig. 98** and while slowly turning machine pulley over toward the operator, turn eccentric stud **J4, Fig. 98,** as required until there is no movement of the feed rock shaft connecting link **Q2, Fig 98** and thus no forward or reverse motion in the feed. Securely tighten set screw **D4.**

TO ADJUST THE STOP MOTION MECHANISM FOR WINDING BOBBINS

In order to operate the bobbin winder without running the stitching mechanism, it is necessary to release the stop motion mechanism in relation to the machine pulley. To release the stop motion, hold the

machine pulley and turn the stop motion stop screw **G4, Fig. 100,** over toward you as shown in **Fig. 99.**

Fig. 99. Releasing the Stop Motion

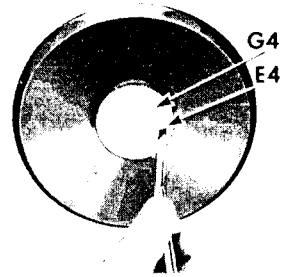


Fig. 100. Loosening the Stop Screw

If the machine continues to run after the stop motion clamp screw **G4** has been released, remove it by loosening the small screw **E4, Fig. 100,** which holds it in place, take off the clamp screw **G4,** as shown in **Fig. 101,** and inspect the parts for wear, dirt, or hardened grease. Examine the position of the clamp washer **H4, Fig. 102.** The two inner prongs are not flat, but are bent outward on one side. The correct position of the clamp washer **H4** is against the machine pulley hub **with the inner prongs in the slots of the bushing, but projecting outward** to make contact with the stop motion stop screw **E4.** When the washer is incorrectly inserted, with the two inner prongs projecting toward the bushing, turning the clamp screw **G4** may not release the sewing mechanism.

Before replacing the clamp stop motion washer **H4,** remove the machine pulley and check for hardened oil, burrs on bushing or projecting set screw on flanged bushing. Dress down burrs with a fine file. Remove hardened oil with a wire brush or with steel wool. Lubricate the bushing and replace machine pulley. Replace washer **H4** as described above.

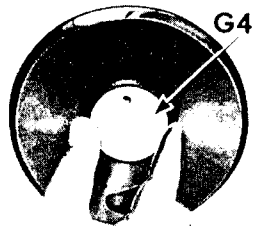


Fig. 101. Removing the Clamp Screw

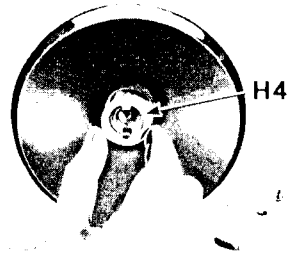


Fig. 102. Removing the Clamp Washer

NOTE: Sometimes it is found necessary to change the position of the washer **H4,** by giving it a half turn before replacing the clamp screw **G4.**

TO ADJUST THE BOBBIN WINDER

The pressure of the rubber ring **A4, Fig. 103**, on the bobbin winder, against the hub of the machine pulley must be sufficient to wind the bobbin.

CAUTION: Too much pressure may cause needless wear of the rubber ring **A4.**

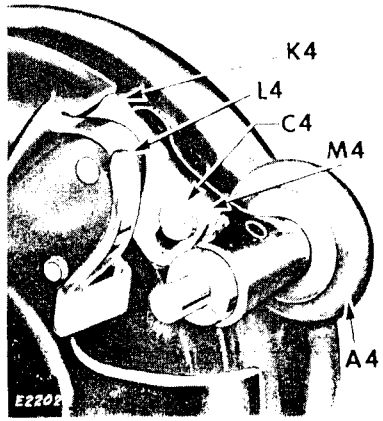


Fig. 103. Adjusting Bobbin Winder

To adjust the pressure, press down bobbin winder until latch **L4, Fig. 103** drops down and holds the bobbin winder spindle. Loosen screw **C4, Fig. 103** and while holding rubber ring **A4** firmly against hub of machine pulley, press down on tripper arm at **K4, Fig. 103** to increase the pressure, or at **M4, Fig. 103** to decrease the pressure. When sufficient pressure is obtained, securely tighten screw **C4.**

NOTE: If the rubber ring **A4** becomes worn, or if oil has been allowed to come in contact with it, the ring will not have the proper contact with the machine pulley hub and may slip when attempting to wind a bobbin. A worn or oily ring should be replaced.

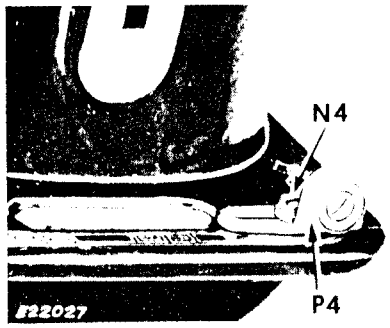


Fig. 104. Adjustment for Winding Bobbins Evenly

TO WIND BOBBINS EVENLY

If the thread does not wind evenly on the bobbin, loosen the screw **N4, Fig. 104** and slide the bobbin winder tension bracket **P4, Fig. 104** toward the right or left along the bed of machine, as required. Then securely tighten screw **N4.**

TO REMOVE ARM SHAFT CONNECTION BELT FROM WITHIN THE ARM

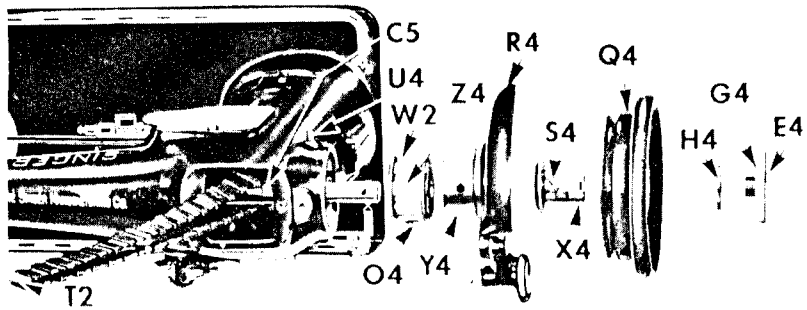


Fig. 105. Removing and Replacing Arm Shaft Connection Belt

To remove the arm shaft connection belt **T2, Fig. 105** loosen stop motion stop screw **E4, Fig. 105** and remove clamp screw **G4, Fig. 105,** washer **H4, Fig. 105** and machine pulley **Q4, Fig. 105.** Remove arm top cover. Remove flanged bushing set screw **S4, Fig. 105.** Loosen arm shaft bushing set screw **U4, Fig. 105** in rear of machine. Remove belt **T2** from upper sprocket **W2, Fig. 106.** Loosen two set screws **O4** and **Z4, Fig. 105** and, by tapping against upper sprocket **W2, Fig. 106,** simultaneously remove upper sprocket **W2,** arm shaft bushing **Y4** with bobbin winder bracket **R4, Fig. 105** and flanged bushing **X4, Fig. 105.**

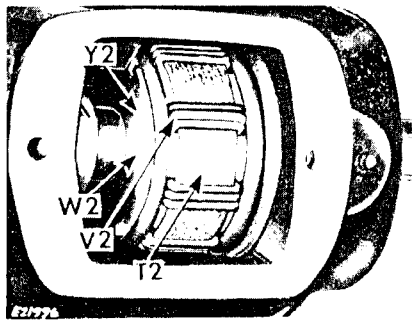


Fig. 106. Removing Arm Shaft Bushing

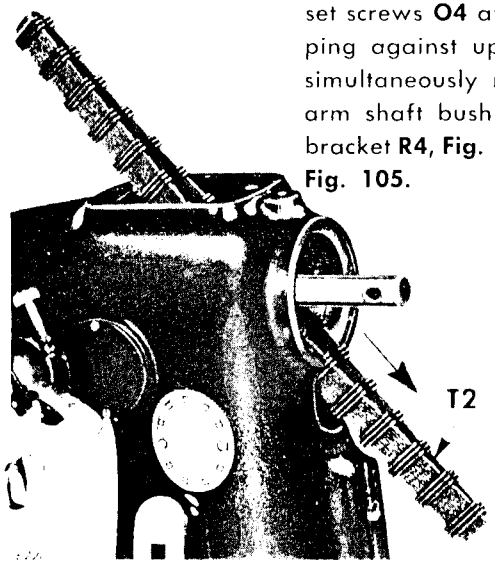


Fig. 107. Drawing the Belt Out of Arm

Remove arm shaft connection belt **T2** from lower sprocket under the machine bed.

Lift belt **T2** up through the arm cap hole as far as possible, as shown in **Fig. 105** and draw it out through the space formerly occupied by the arm shaft bushing **Y4,** as shown in **Fig. 107.**

TO REPLACE ARM SHAFT CONNECTION BELT

To replace arm shaft connection belt **T2**, first draw belt through hole at machine pulley end of machine arm and up through arm cap hole at top of machine, as shown in **Fig. 108.**

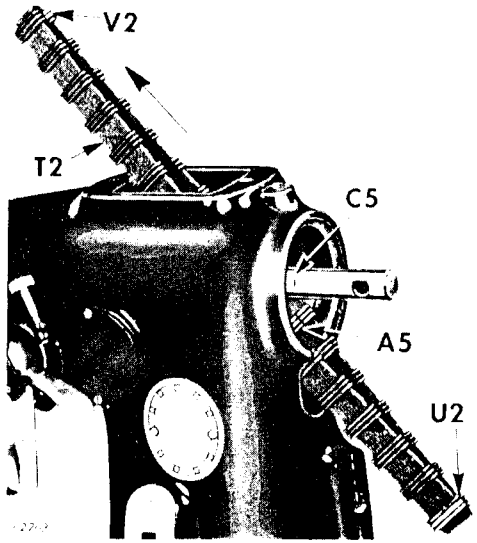


Fig. 108. Drawing Belt into Arm

Replace set screws **O4** and **Z4, Fig. 109** in upper sprocket **W2, Fig. 109** and screw them inward flush with sprocket teeth, as shown in **Fig. 109.** Replace upper sprocket **W2** on arm shaft **B5, Fig. 109** so that timing mark **Y2, Fig. 109** is toward needle bar end of machine and so that the second set screw **Z4**, as arm shaft **B5** is turned over toward operator, is in line with flat **C5, Fig. 108,** on arm shaft. Tighten set screw **Z4**, then tighten set screw **O4.**

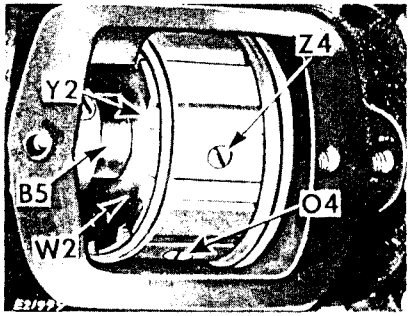


Fig. 109. Replacing Upper Sprocket

Place belt **T2** over upper sprocket **W2** with the joint edges of the clips (one group of which is shown at **A5, Fig. 108**) on inside of belt. Make sure that one of the two groups of copper clips **V2, Fig. 108** falls into the sprocket groove stamped with the timing mark **Y2, Fig. 109.**

Replace belt **T2** on lower sprocket **Z2, Fig. 110** so that the other group of copper clips **U2, Fig. 110** falls into sprocket stamped with timing mark **O2** on lower sprocket, as shown in **Fig. 110.**

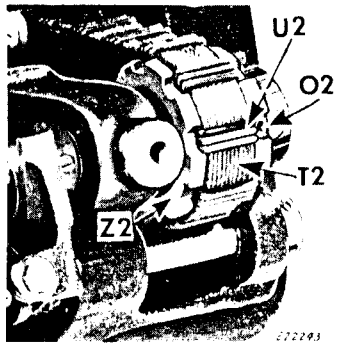


Fig. 110. Lower Timing Mark

Replace arm shaft bushing **Y4, Fig. 111** together with bobbin winder bracket **R4, Fig. 111** on arm shaft, so that long groove **D4, Fig. 111** on arm shaft bushing is in line with set screw **U4** at the rear of the machine arm. Push arm shaft bushing **Y4** inward flush to arm casting, make certain that there is approximately .005 inch end play, and securely tighten set screw **U4.**

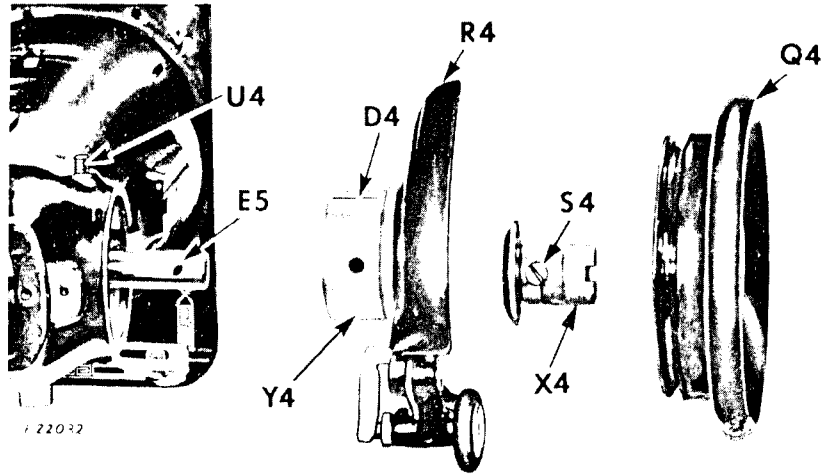


Fig. 111. Replacing Arm Shaft Bushing

Replace flanged bushing **X4** on arm shaft so that larger end of screw hole in bushing is in line with larger end of screw hole **E5, Fig. 111** in arm shaft. Replace set screw **S4, Fig. 111** in flanged bushing. Tap the flanged bushing **X4** against the arm shaft bushing sufficiently to remove end play without binding and securely tighten set screw **S4.** Check for burred edges on flanged bushing and remove burrs with light file where necessary.

Replace machine pulley **Q4**, on flanged bushing, as shown in **Fig. 112.**

Replace washer **H4, Fig. 112** against machine pulley hub with the inner prongs **N5, Fig. 112** in the slots of the bushing, **but projecting outward,** to make contact with the stop motion stop screw **E4, Fig. 112,** as instructed on page 39. Replace clamp screw **G4, Fig. 112** and tighten stop screw **E4.**

Check the timing of the feed in relation to the movement of the needle, and adjust where necessary, as instructed on pages 32 and 33.

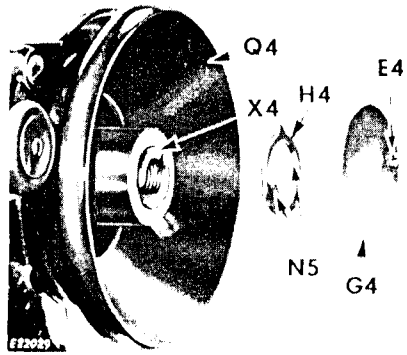


Fig. 112. Replacing Stop Motion Mechanism

TO SET THE PRESSER BAR AT THE CORRECT HEIGHT

When the presser foot is raised, there should be a clearance of 5/16 inch between the presser foot and the throat plate.

To set the presser bar at the correct height, raise the presser bar lifter **T5, Fig. 113** to its highest position, loosen the set screw **U5, Fig. 113** and raise or lower the presser bar as required. Then, after locating the presser foot in relation to the needle, as described on page 28, retighten the set screw **U5, Fig. 113.**

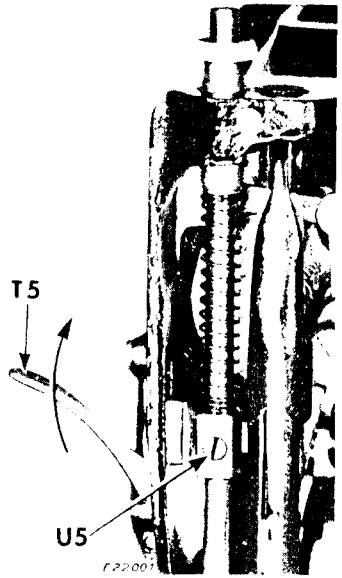


Fig. 113. Adjusting Height of Presser Bar

TO "RUN-IN" THE MACHINE

When a machine is completely assembled and adjusted, it should be checked for binding first. Then it should be "run-in" by an electric motor, for from 15 to 30 minutes, or until all moving parts run smoothly.

"Running-in" a machine should be done after every installation of an arm shaft, an arm rock shaft or an arm shaft connection belt, and after every general repair.

CARE OF THE ARM SHAFT CONNECTION BELT

DO NOT LUBRICATE the arm shaft connection belt. To ensure the long life and efficient performance of this belt, it must be kept **clean** and **free from excess oil** at all times.

When the arm shaft connection belt becomes loose or worn it should be removed and replaced, as instructed on pages 41 to 43.

DANGERS OF OVER-LUBRICATION

The application of too much oil to the sewing machine parts can cause damage to the arm shaft connection belt, as explained on page 44, or can cause damage to fabrics and threads used during sewing. One or two small drops of oil at the right point, when needed, will give the machine the protection it requires. Excess oil is merely a waste of oil and a source of danger to the appearance of the work accomplished on the machine.

TO LUBRICATE THE MOTOR

Never apply oil or ordinary grease to the sewing machine motor. Use only **SINGER*** MOTOR LUBRICANT. Entrance of oil into the motor may cause the motor to "burn out."

When the machine is shipped from the factory, the two grease tubes **M5, Fig. 114** are filled with enough lubricant for approximately six months' use.

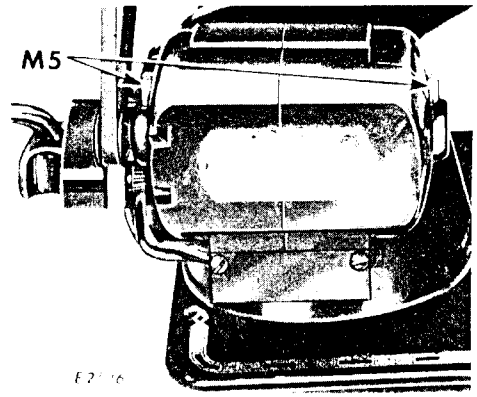


Fig. 114. Motor Lubricating Points

Refill grease tubes **M5** at least once each six months by inserting tip of lubricant container into grease tubes **M5** and squeezing sufficient lubricant into each tube to fill it.

TO OIL THE MACHINE

Occasionally apply a drop of oil to all points indicated by unlettered arrows in **Figs. 115** to **119**, and carefully clean the machine to insure smooth and satisfactory performance.

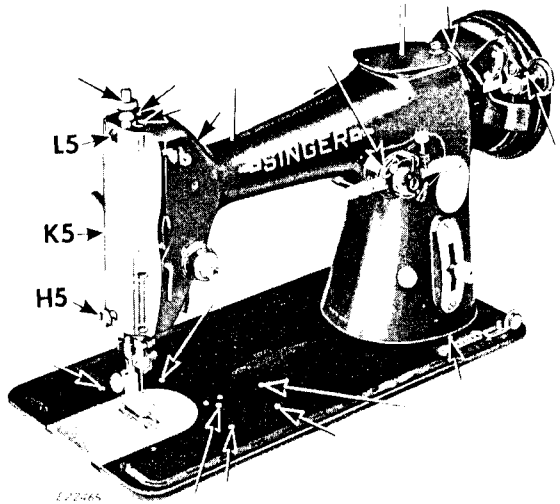


Fig. 115. Front View—Showing Oiling Points

Loosen screw **J5, Fig. 116** and swing top cover plate aside for access to oiling points under plate. DO NOT LUBRICATE the arm shaft connection belt. This belt must be kept clean and free from excess oil. See instructions also on page 44 concerning care of belt.

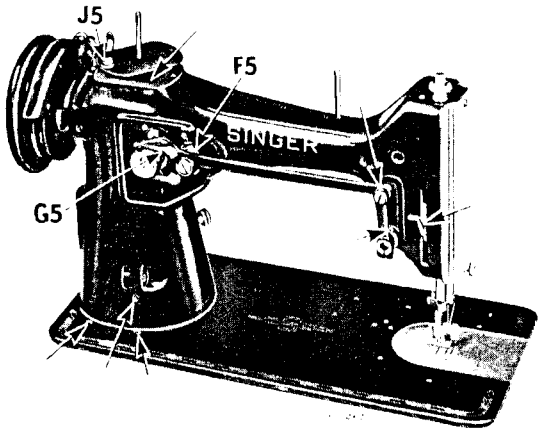


Fig. 116. Rear View—Showing Oiling Points

Loosen thumb screw on cover plate at back of machine arm and swing plate out of way to oil the bight mechanism at **F5** and **G5, Fig. 116.**

Remove face plate **K5, Fig. 115** by taking out thumb screw **H5, Fig. 115** and loosening screw **L5, Fig. 115**, near top of plate.

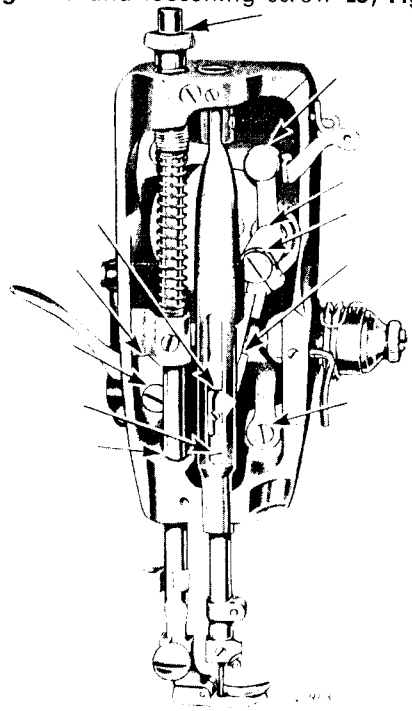


Fig. 117. Face Plate Removed Showing Oiling Points

Slip face plate over screw **L5, Fig. 115.** Oil the points indicated by unlettered arrows in **Fig. 117.** Replace the face plate.

Apply a drop of oil to all other points indicated by unlettered arrows in **Figs. 115** and **116.**

CAUTION: The grease packed in the hook shaft gear case under the bed of the machine, shown in **Fig. 91, does not require changing,** unless this section of the machine has been submerged in Varsol cleaning fluid. When necessary, repack the gear case with **SINGER*** GEAR LUBRICANT.

NOTE: Motor and SINGERLIGHT have been removed in these oiling illustrations for clearer views of parts, but need not be removed when actually oiling the machine.

Occasionally apply a drop of oil to the race of the bobbin case holder, as shown by the unlettered arrow in **Fig. 118.**

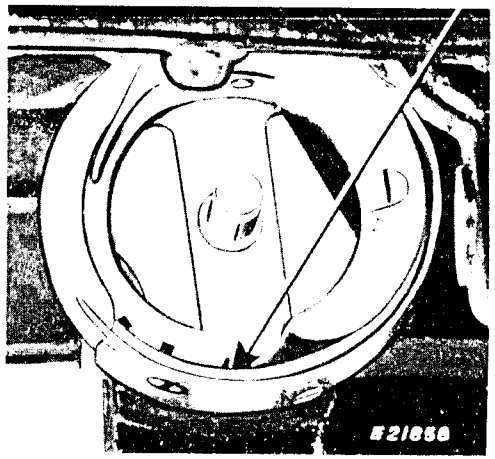


Fig. 118. Oiling Point in Bobbin Case Holder

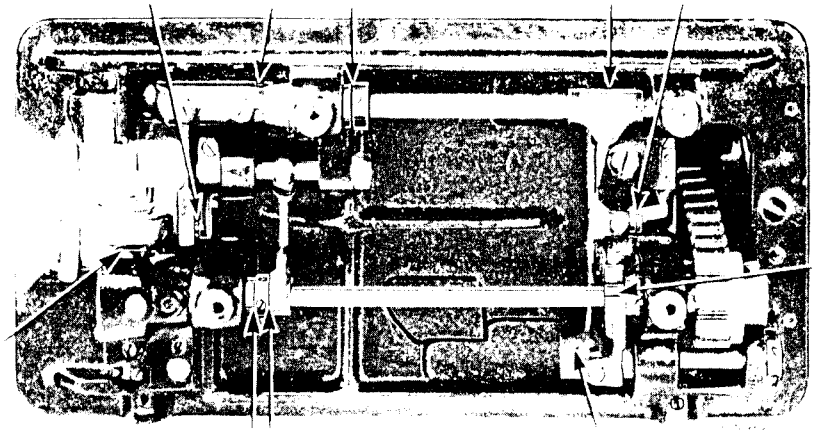


Fig. 119. Oiling Points in Base of Machine

Turn the machine back on its hinges and oil the places shown by unlettered arrows in **Fig. 119.**

CAUTION: DO NOT LUBRICATE arm shaft connection belt. See instructions on page 44.

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