

SINGER
147-90 AND 147-115

USE ONLY **SINGER*** OILS and LUBRICANTS

*They insure freedom from lubricating trouble and
give longer life to sewing equipment*

The following are the correct lubricants for this machine:

TYPE B — MANUFACTURING MACHINE OIL, HEAVY
GRADE

When a stainless oil is desired, use:

TYPE D — MANUFACTURING MACHINE OIL, STAIN-
LESS, HEAVY GRADE

OTHER **SINGER** LUBRICANTS

TYPE E — STAINLESS THREAD LUBRICANT

For lubricating the needle thread of sewing machines for stitching fabrics or leather where a stainless thread lubricant is required.

TYPE F — MOTOR OIL

For oil lubricated motors and plain bearings in power tables and transmitters.

NOTE: All of the above oils are available in 1 quart, 1 gallon and 5 gallon cans or in 55 gallon drums.

GEAR LUBRICANT

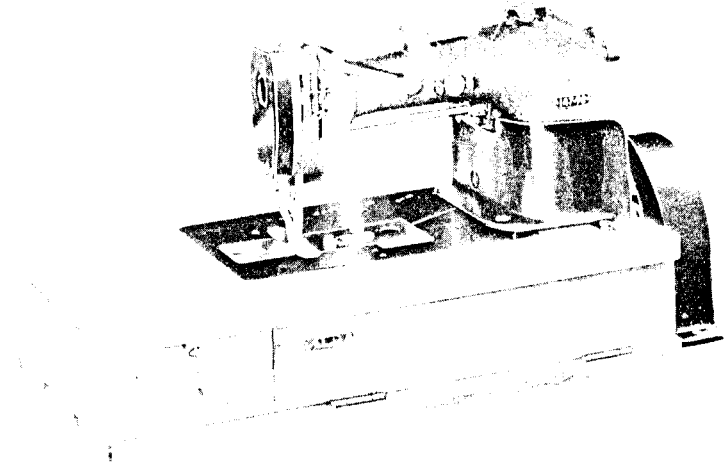
This specially prepared grease is recommended for gear lubrication on manufacturing sewing machines.

BALL BEARING LUBRICANT

This pure grease is specially designed for the lubrication of ball bearings and ball thrust bearings of motors and electric transmitters, ball bearing hangers of power tables, etc. **Furnished in 1 lb. and 4 lb. tins.**

20475

INSTRUCTIONS FOR USING AND ADJUSTING **SINGER*** SEWING MACHINES **147-90 AND 147-115** TWO-THREAD CHAIN STITCH



Special attention is called to the lubricating instructions on pages 4 to 7.

*A TRADE MARK OF

THE SINGER MANUFACTURING COMPANY

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.

THE IMPORTANCE OF USING **SINGER*** PARTS AND NEEDLES IN **SINGER** MACHINES

The successful operation of SINGER machines can only be assured if SINGER parts and needles are used. Supplies are available at all SINGER Shops for the Manufacturing Trade, and mail orders will receive prompt attention.

SINGER Needles should be used
in SINGER Machines.
These Needles and their Containers
are marked with the
Company's Trade Mark "SIMANCO.*" 1

Needles in Containers marked
"FOR SINGER MACHINES"
are NOT **SINGER** made needles. 2

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DESCRIPTION

Machine 147-90 has one needle and one looper, and is designed for cloth or leather; stitching gloves, closing shoes, etc., also for binding light and medium weight fabrics or leather.

It has alternating pressers and a drop feed, the upper and under feeds working independently of each other.

It has an automatic oiling system and is provided with ball bearings for the balanced arm rotary shaft intermediate and rear bearings.

It is regularly equipped with a foot lifter. A knee lifter will be furnished, instead of a foot lifter, when specified on order.

Needle bar stroke is 1-5/16 inches.

The machine is adjustable to produce from 5 to 20 stitches to the inch.

The machine base is 16-1/2 inches long.

The space at right of needles is 8-1/4 inches.

Machine 147-115 is similar to Machine 147-90 except that it has two needles and two loopers, and is designed for stitching general work in fabrics and light and medium weight leather.

It is furnished in gauges from 3/32 to 3/8 inch, in steps of 1/32 inch. Orders must specify the gauge required.

TO SET UP THE MACHINE

Before placing the machine on the metal base, see that the rubber insulating bushings are in place in the four holes in the machine bed, and that the four felt pads are over the studs in the corner of the base. Place the machine on these pads, with the four studs through the rubber bushings.

CAUTION—After setting up, do NOT start the machine until it has been thoroughly oiled, as instructed on pages 4 to 7.

SPEED

The maximum speed recommended for these machines is 3000 stitches per minute, depending upon the materials used and the operations performed. For the first few days run the machine slower than the maximum, until the moving parts become glazed by their action upon each other.

The machine pulley should always turn over from the operator.

TO OIL THE MACHINES

These machines are each equipped with an oiling system which automatically delivers the required quantity of oil to all principal bearings. An agitator on the lower end of the connecting rod contacts the oil in the reservoir at each revolution of the main shaft and lubricates, by splash, various bearings inside the machine arm. Some of this oil is distributed, through pipes and wicks, to the principal bearings outside the machine arm.

See large diagrams on pages 16 and 17, showing distribution of oil.

Use "TYPE B" or "TYPE D" OIL, sold only by Singer Sewing Machine Company. See inside front cover, for description of these oils.

To insure operation of this oiling system, it is essential that the following instructions be observed to the letter. Failure to do this may result in serious damage to the machines.

A machine new from the factory, or one that has been idle for one or more days, must be oiled as instructed below and on pages 5 and 6.

NOTE:—It is not necessary to remove the cloth plate for the first servicing or subsequent oiling of the machines. For this purpose merely remove the right-hand slide plate. The cloth plate and throat plate are removed in Figs. 2 and 3 for clearer illustration only.

ORDER OF LUBRICATION:

1. Lift and turn aside the cover **AA**, Fig. 2, and apply oil to filler **BB**, Fig. 2, until the oil stands at the mark **CC**, Fig. 3, on the gauge. The oil must be maintained at this level. After applying oil to the filler, turn the cover to closed position.

CAUTION—This cover must be kept closed at all times, except when opened for oiling.

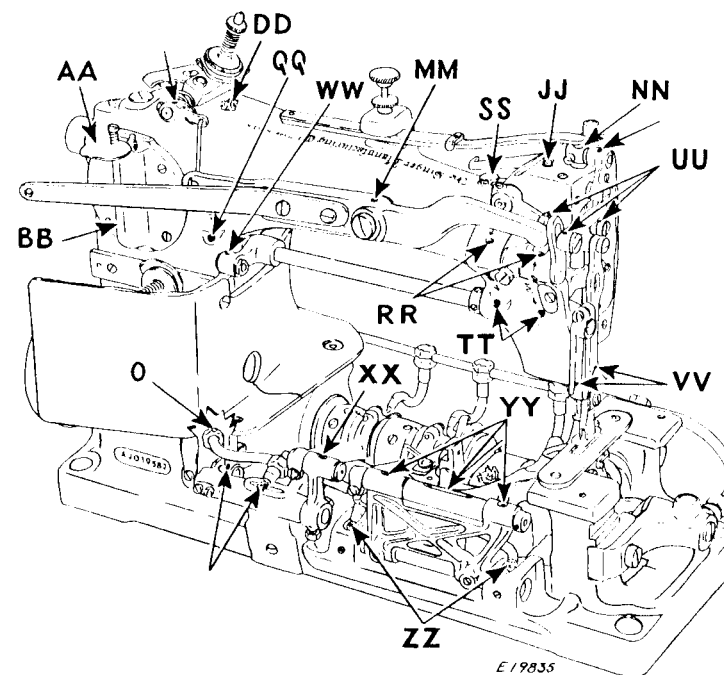


Fig. 2. Priming and Oiling Points at Rear of Machine

2. Saturate the wicks at **DD** and **JJ**, Fig. 2.
3. Apply oil to all oil holes or troughs marked "OIL" and at all other places indicated by unlettered arrows in Figs. 2 and 3.
4. Apply a drop of oil to **MM**, Fig. 2, for the foot lifter lever, and at **NN**, Fig. 2, where the presser bar passes through its bushing.
5. Apply a few drops of oil at the points **QQ**, **RR**, **TT**, **UU**, **VV**, **WW**, **XX**, **YY**, and **ZZ**, Fig. 2.

6. Fill the main oil pipe to overflowing through the oil hole **LL**, **Fig. 3**. This is **important**, as it primes various oil wicks.

7. Saturate the wicks at **EE**, **FF**, **GG** and **HH**, **Fig. 3**.

8. Fill the oil cup **SS**, **Fig. 3**.

9. After a machine has been running at a moderate speed for approximately five minutes, stop it and let it stand idle for a few minutes. Then check the oil in the reservoir and, if necessary, add sufficient oil to bring the oil level to the mark **CC**, **Fig. 3**, on the gauge.

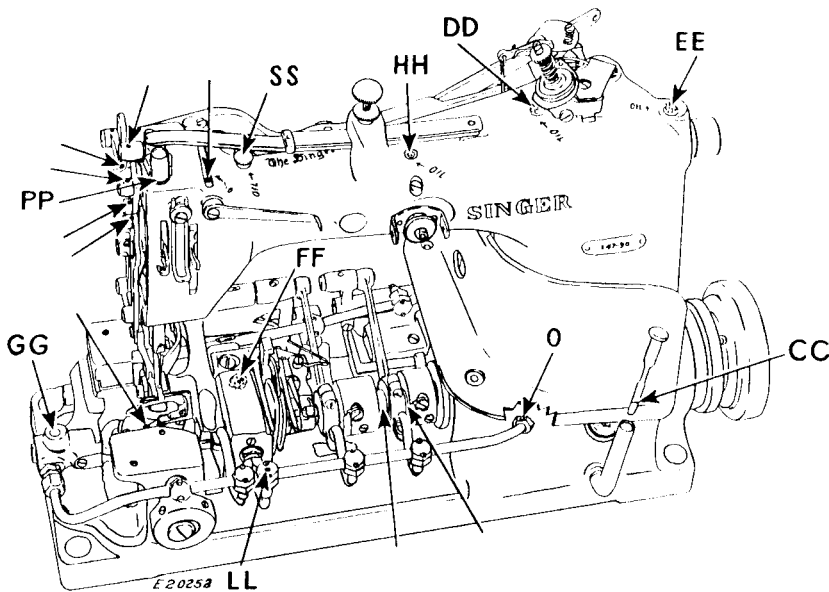


Fig. 3. Priming and Oiling Points at Front of Machine

ORDER OF LUBRICATION: (Machines in daily use).

1. Apply oil to the filler **BB**, **Fig. 2**, as instructed in step 1 on page 5. Never permit the level of the oil to become lower than 1/4 inch below the mark **CC**, **Fig. 3**, when the machine is at rest.

2. Fill the oil cup, **SS**, **Fig. 3**, twice daily.

3. Apply oil twice daily to all oil holes marked "OIL."

The letter "o" marked on oil pipe couplings **O**, **Fig. 2** and **3**, must always be at the top. This is to insure that the oil spoon, attached to the inner end of each coupling, is open side up to receive the oil.

NEEDLES

Needles for these Machines are of Class and Variety 62 X 43 and are made in sizes 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, and 24.

The size of the needle is determined by the size of the thread being used. The thread must pass freely through the needle eye.

The use of rough or uneven thread, or of thread which passes with difficulty through the needle eye, 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 the letter "X."

The following is an example of an intelligible order:

"100 No. 16, 62 X 43 Needles"

Best stitching results will be obtained with needles sold by Singer Sewing Machine Company.

NEEDLE SETTING

When replacing a needle, turn the machine pulley over from you until the needle bar moves to its highest point, then loosen the set screw in the lower end of the needle bar. Place the needle up into the needle bar as far as it will go, with its single continuous groove toward you, then tighten the set screw.

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UPPER THREADING ON MACHINE 147-90

See Fig. 4

Pass the thread from the unwinder through eyelet 1 in the tension thread guide; to the left at the front side of and between the tension discs 2 at the top of the machine, to the left through eyelet 3 in the tension thread guide, down and to the left through the eyelet 4 in the thread

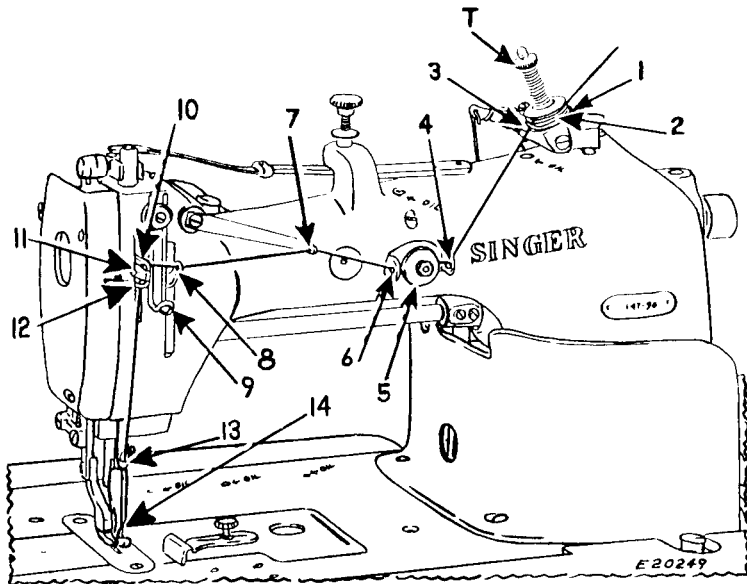


Fig. 4. Threading the Needle, Machine 147-90

nipper bracket, to the left over, and between, the thread nipper 5, to the left through eyelet 6 in the thread nipper bracket, to the left through eyelet 7 in the slack thread regulator, to the left through the eyelet 8 in the thread controller, to the left in front of the auxiliary take-up wire 9, to the left through the eyelet 10 in the thread take-up, down and under the thread take-up plate 11, down and through the hole 12 of the thread take-up, down through the eyelet 13 at the lower end of the needle bar, and down and from front to back (away from the operator) through the eye 14 of the needle.

Draw about two inches of thread through the eye of the needle with which to commence sewing.

UNDER THREADING OF MACHINE 147-90

See Figs. 5 and 6

Pass thread from unwinder through hole A, Fig. 5, in tension bracket, over and between tension discs B, at back of machine, down through hole C in tension bracket, down through thread guide D, that stands up from base of machine. Pass thread through slot E, and into wire guide F, Fig.

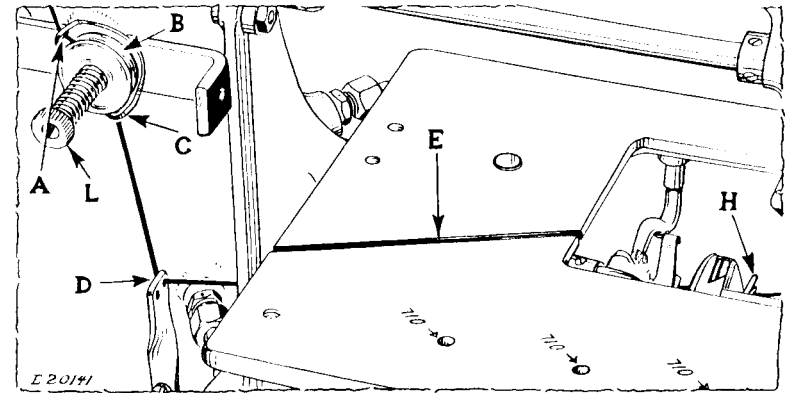


Fig. 5. Threading Looper—Rear View

6, at back end of nipper plate and into slot G in nipper plate. Raise ends of fork, pass thread through slots H, at front ends of fork, then push fork down. Pass thread through hole J, in heel of looper and then, away from operator, through eye K of looper. Draw about two inches of thread through eye of looper with which to commence sewing.

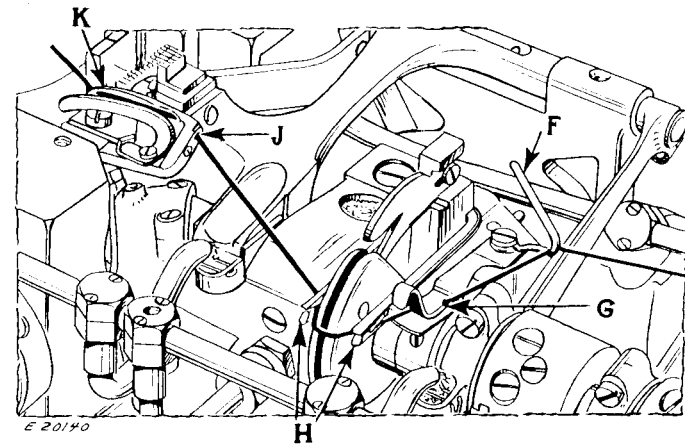


Fig. 6. Threading Looper—Front View

NOTE:—It is not necessary to remove cloth plate or throat plate for looper threading. They are removed, above, for the purpose of illustration, only.

UPPER THREADING OF MACHINE 147-115

See Fig. 7

To thread the right hand needle, the one nearest the upright part of the arm, pass the thread from the unwinder through the hole 1R in the

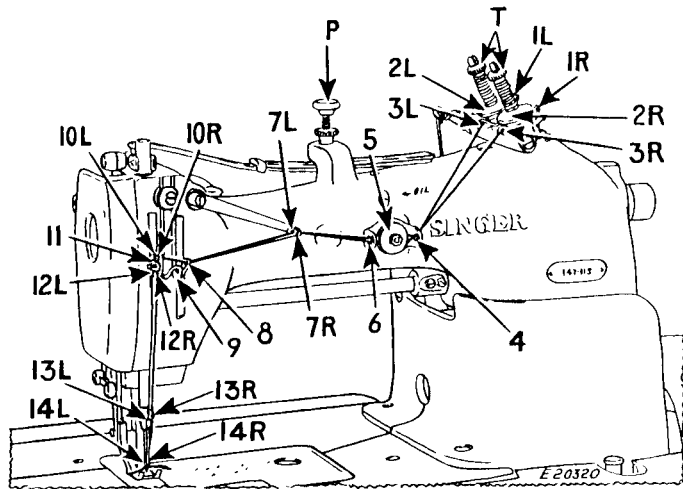


Fig. 7. Upper Threading

front tension bracket and between the front tension discs 2R at the top of the machine, through the hole 3R in the tension bracket, down into the nipper guide 4, over and between the nipper discs 5, into the nipper guide 6, through the front hole 7R in the slack thread take-up, through the eyelet in the needle thread controller 8, across the front of the slack thread controller 9 and through the front eyelet 10R in the take-up lever, down behind the thread retainer spring 11 down through the front notch 12R of the thread guide, down through the right hand thread guide 13R at the lower end of the needle bar and from you through the eye 14R of the right hand needle.

To thread the left hand needle or the one farthest from the upright part of the arm, pass the thread from the unwinder through the hole 1L in the rear tension bracket and between the rear tension discs 2L at the top of the machine, through the hole 3L in the tension bracket, down into the nipper guide 4, under between the nipper discs 5, into the nipper guide 6, through the rear hole 7L in the slack thread take-up, through the eyelet in the needle thread controller 8, across the front of the slack thread controller 9 and through the rear eyelet 10L in the take-up lever, down toward the front between the thread retainer spring 11 and the take-up lever, down through the rear notch 12L of the thread guide, down through the left-hand thread guide 13L at the lower end of the needle bar and from you through the eye 14L of the left hand needle.

Draw about two inches of thread through the eye of each needle with which to commence sewing.

UNDER THREADING ON MACHINE 147-115

See Figs. 8 and 9

To thread the back looper, pass the thread from the unwinder through the hole 1, Fig. 8 in the right hand tension bracket and over between the

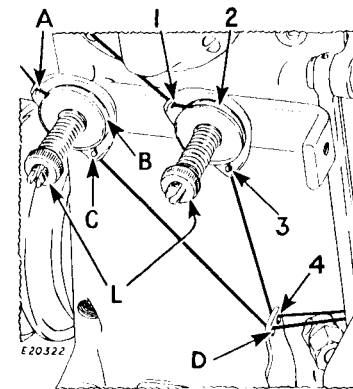


Fig. 8. Under Threading

two inches of thread through the eye of the looper with which to commence sewing.

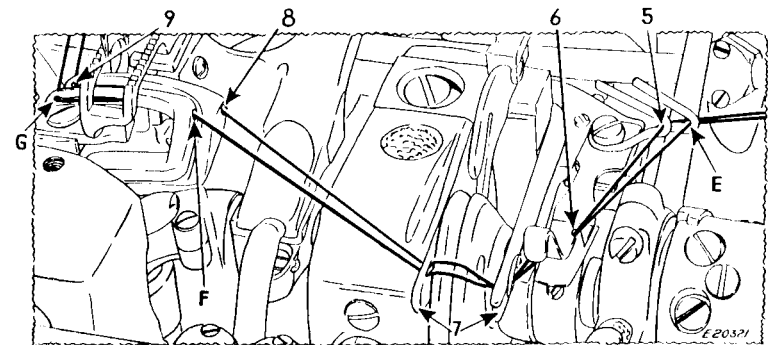


Fig. 9. Under Threading

To thread the front looper or the one nearest you, pass the thread from the unwinder through the hole A, Fig. 8 in the left hand tension bracket, over between the tension discs B, down through the eyelet C, down through the front eyelet D in the thread guide that stands up from the base of the machine. Pass the thread into the wire guide E, Fig. 9 at the back end of the nipper plate and into the slot 6, in the nipper plate.

Raise the ends of the fork and pass the thread through the slots **7** at the ends of the fork. Push the fork down and pass the thread through the hole **F** in the heel of the front looper and from you through the eye **G** of the looper. Draw about two inches of thread through the eye of the looper with which to commence sewing.

TO REGULATE THE TENSIONS

The tension on the needle threads is regulated by means of the thumb nuts **T**, **Figs. 4** and **7**. To increase needle thread tension, turn these thumb nuts to the right, or inward, or for less tension turn these thumb nuts to the left, or outward. Tension should be just enough to set the stitch properly in the goods.

Looper thread tension is regulated by means of the thumb nuts **L**, **Figs. 5** and **8**. For more tension turn these thumb nuts inward, toward the machine, or for less looper thread tension turn these thumb nuts outward, away from the machine. The tension on the looper threads should be very light.

TO REGULATE THE PRESSURE ON THE MATERIAL

The pressure of the presser foot on the material is regulated by means of the wing nut **P**, **Fig. 7** at the top of the machine.

Turn the wing nut **P** downward to increase the pressure, or turn it upward to decrease the pressure.

INSTRUCTIONS FOR ADJUSTERS and MECHANICS

TO SET THE LOOPERS THE CORRECT DISTANCE FROM THE CENTERS OF THE NEEDLES

When the needle bar is at its lowest position, the distance from the center of the needle on Machine 147-90 to the point of the looper (or the distance from the center of the front needle on Machine 147-115 to the point of the front looper) should be $\frac{3}{16}$ inch.

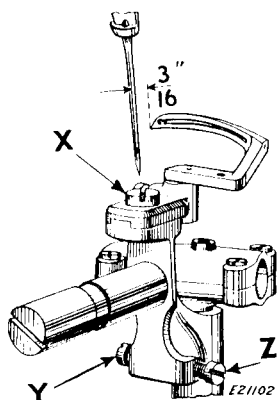


Fig. 10
Looper Setting—Machine 147-90

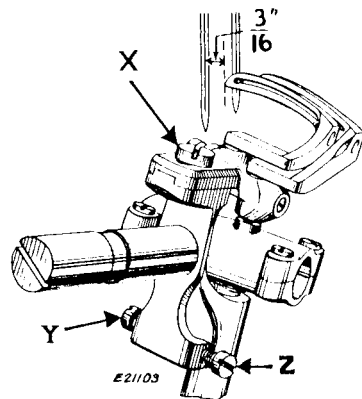


Fig. 11
Looper Setting—Machine 147-115

If the distance is less than $\frac{3}{16}$ inch, loosen the right hand screw Z, Figs. 10 and 11 in the looper bracket and tighten the left hand screw Y, Figs. 10 and 11 in the looper bracket the required amount. If the distance is more than $\frac{3}{16}$ inch, loosen the left hand screw Y and tighten the right hand screw Z the required amount. When the correct distance is obtained, see that the two screws Y and Z are securely tightened.

TO CHANGE THE SIDEWISE POSITION OF THE LOOPERS IN RELATION TO THE NEEDLES

The loopers should be set to come equally close to the needles on their forward and backward and backward strokes. To change the side-wise position of the loopers in relation to the needles, loosen the screw X, Figs. 10 and 11 and move the looper holder, as required, then securely tighten the screw X.

TO SET THE NEEDLE BAR IN CORRECT POSITION

Turn the machine pulley over from you until the points of the loopers, on their forward stroke, reach the centers of the needles.

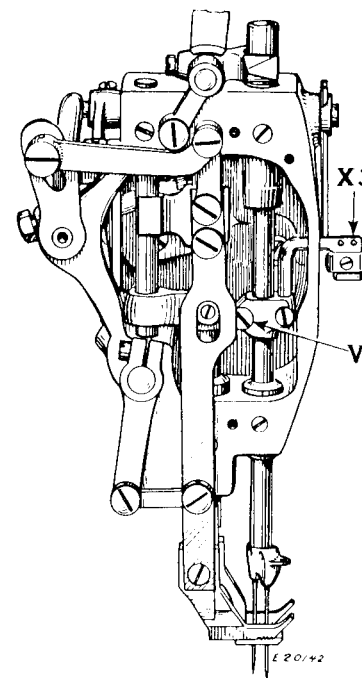


Fig. 12. Needle Bar Adjustment

When the loopers are in this position, the needle eyes should be about $\frac{1}{8}$ inch below the points of the loopers, so that the needle eyes and the eyes of the loopers will be in exact alignment when they pass each other on the loop-taking stroke.

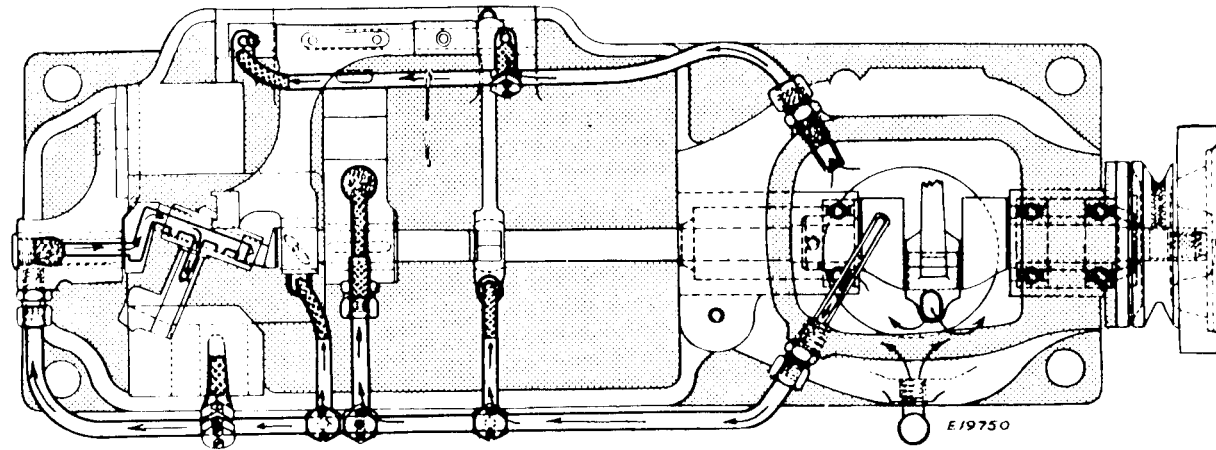
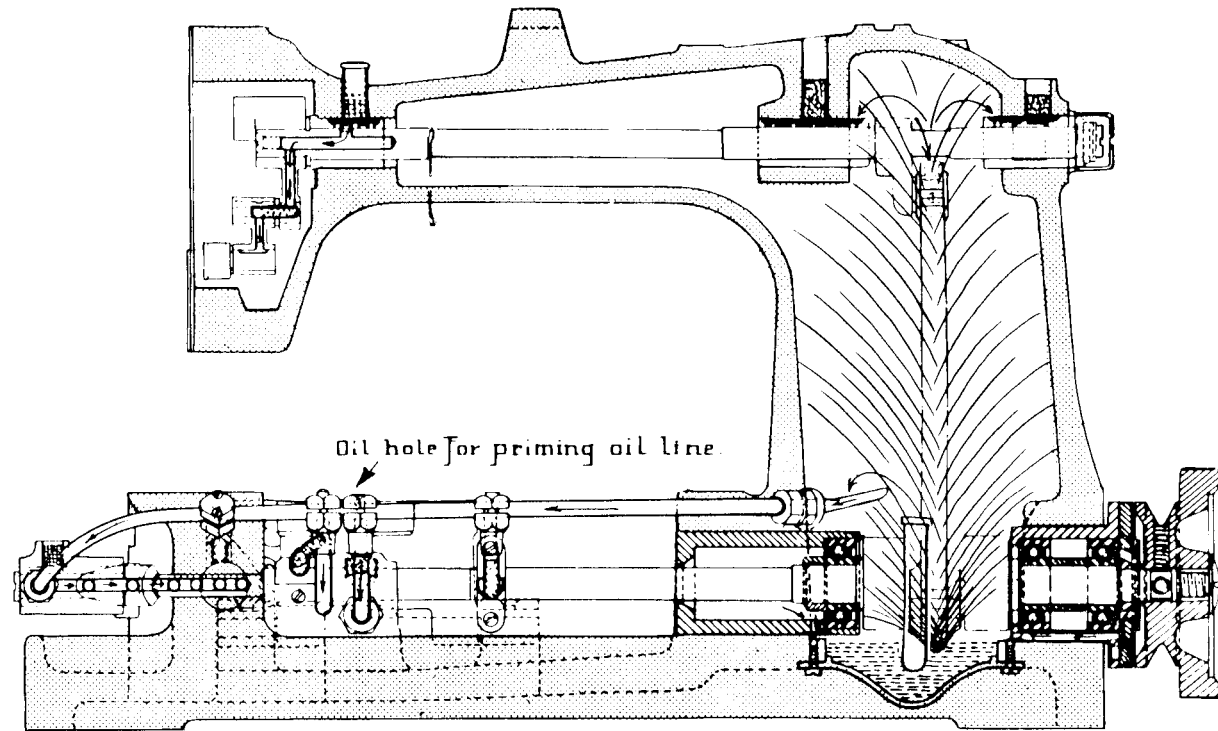
When the needle bar is not set at the correct height, loosen the needle bar clamping screw V, Fig. 12 and move the needle bar up or down, as required. Then securely tighten clamping screw V, making sure that the needles center in their respective notches in the needle hole in the throat plate.

NOTE:—For some threads it may be necessary to vary the height of the needle bar, owing to the differences in finish, twist, elasticity, etc. This applies also where different materials are sewn.

TO SET THE NEEDLE THREAD TAKE-UP

Needle thread take-up X3, Fig. 12 is usually set with the bottom of the take-up flush with the bottom of its holder.

Diagrams
of Machine showing
wicks and bearings
oiled by automatic
splash, also bearings
oiled by gravity
through tubes on
outside of the
machine.



TO CHANGE THE EXTENT OF THE NEEDLE-AVOIDING MOTION OF THE LOOPER

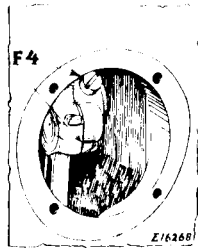


Fig. 13
Rock Shaft Crank

The extent of the sidewise movement of the loopers is regulated by moving the rotary shaft endwise, toward the needles for less sidewise motion, or away from the needles for more sidewise motion.

To adjust, loosen the two screws **F4**, Fig. 13 in the rock shaft crank; also loosen the set screw in the hub of the under thread rotary take-up **T3**, Fig. 14, and loosen the three screws **G4**, Fig. 14 and the three screws **H4**, Fig. 14 in the under feed eccentric **U2**, Fig. 14 and in the upper feed eccentric **W2**, Fig. 14 respectively.

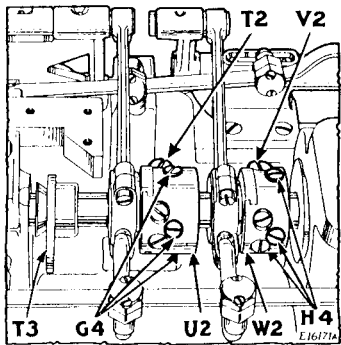


Fig. 14. Feed Eccentric

Remove the machine pulley cap screw and loosen the two screws in the belt groove of the machine pulley, then take off the machine pulley.

Loosen ball bearing case screw **K4**, Fig. 15. To move the rotary shaft toward the needles, turn the three position screws **J4**, Fig. 15 uniformly inward, and tap the ball bearing case **L4**, Fig. 15 until the required extent of sidewise motion is obtained, then tighten screw **K4**. To move the rotary shaft away from the needles, turn the three screws **J4** uniformly outward, then tighten screw **K4**. Replace the machine pulley and turn the screws in the belt groove lightly into the grooves in the shaft. Tighten the cap screw and then tighten the two screws in the belt groove of the machine pulley. Turn the machine pulley a few times by hand to permit the rock shaft and feed eccentrics to align themselves. Then securely tighten screws **F4**, Fig. 13 against their flats and time the feed, as instructed on page 19. Then time the looper thread take-up, as instructed on page 24.

NOTE:—When the proximity of the ball bearing case **L4** to the seat **M4**, Fig. 15, on the arm does not permit the loopers to be moved sufficiently close to the needles (as may be the case when needles of Size 11 or smaller are used), remove arm rotary shaft, as described on page 31 and place washer 131899 on shaft between crank and ball bearing case. Then replace arm rotary shaft, as described on pages 31 and 32.

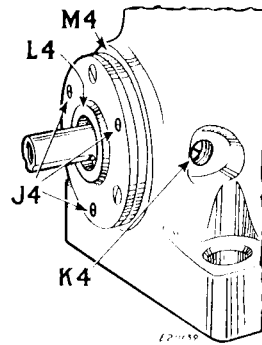


Fig. 15. Rotary Shaft

TO TIME THE UNDER FEED

For correct timing of the under feed the first two of the three set screws **G4**, Fig. 14 must be tightened against the two flats on the rotary shaft. The first of these three screws is the one nearest the stitch regulator screw **T2**, Fig. 14, the second being the one which follows the first when the machine pulley is turned over from the operator. After these two screws have been tightened against their flats, tighten the third screw against the shaft.

TO TIME THE UPPER FEED

Loosen the three set screws **H4**, Fig. 14 in the feed eccentric **W2**, Fig. 14, and turn the eccentric **W2** until the feeding foot moves in unison with the under feed, then securely tighten the first two of the three screws **H4** against their flats on the shaft. The first of these screws is the one nearest the stitch regulator screw **V2**, Fig. 14, the second being the one which follows the first when the machine pulley is turned over from the operator. After these two screws have been tightened against their flats, tighten the third screw against the shaft.

TO ADJUST THE NEEDLE THREAD TENSION RELEASER

The needle thread tension releaser must release the tension on the needle thread when the presser foot is raised.

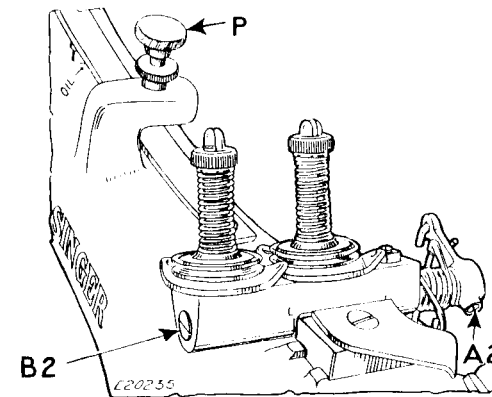


Fig. 16. Adjustment of Tension Releaser

In case the tension releaser does not properly release the thread, loosen set screw **A2**, Fig. 16 and turn the shaft **B2** over to the left until correct adjustment is obtained, then securely tighten the set screw **A2**.

TO ADJUST THE SLACK THREAD REGULATOR

The slack thread regulator **D3**, Fig. 17, on the front of the machine, should be set so that when the loopers are shedding the needle loops on their backward stroke, the thread will not snap from the looper points nor be drawn through the tension discs. To set the slack thread regulator,

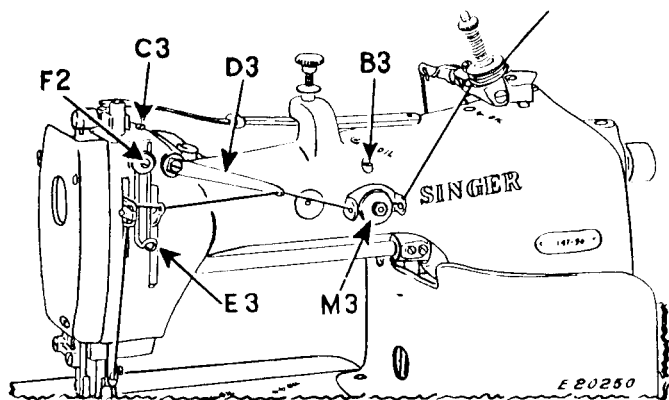


Fig. 17. Needle Thread Adjustment

it is best to start with the regulator in a low position and then continue raising it until the needles back out of the needle loops with as little tension on the thread as possible. To make this adjustment, loosen the clamping screw **C3**, Fig. 17 and raise or lower the slack thread regulator, as required, then securely tighten the clamping screw **C3**.

TO ADJUST THE AUXILIARY THREAD TAKE-UP

The auxiliary thread take-up **E3**, Fig. 17 at the front of the machine, should be set to take up the slack of the needle threads after the loopers have shed the needle loops and as the needle bar finishes its downward stroke and the stitch is set. To change the position of the auxiliary thread take-up, loosen the screw **F2**, Fig. 17 and raise or lower it, as required, then tighten the screw **F2**.

NOTE:—For some threads it will be necessary to set the auxiliary thread take-up at a height different from that required by others, owing to the differences in finish, twist, elasticity, etc.

TO ADJUST THE AUTOMATIC THREAD NIPPER

The automatic thread nipper **M3**, Fig. 17, at the front of the machine, makes it possible to set the stitch tightly without using a heavy tension on the needle threads.

The nipper discs open wide enough to permit the threads to pass freely through the discs, and should close and nip the threads immediately after the loopers have cast off the needle loops on the downward stroke of the needle bar.

To adjust, loosen set screw **B3**, Fig. 17 and move the nipper body inward, away from you, for a wider opening of the discs, or outward for a smaller opening. Then tighten set screw **B3**.

TO CHANGE THE LENGTH OF THE STITCH

While the upper and under feeds should, in general, be set to act synchronously, this setting is subject to some slight variation depending upon the nature of the work being sewn.

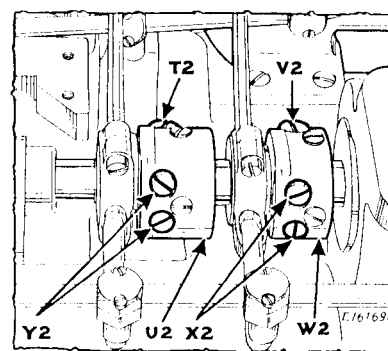


Fig. 18. Showing Upper and Under Feed Regulating Eccentrics

To change the stitch length, first loosen the two clamping screws **Y2**, Fig. 18 in the under feed eccentric **U2**, Fig. 18. To increase the length of stitch, turn the regulating screw **T2**, Fig. 18 over to the left or outward; or to shorten the stitch turn the screw **T2** to the right, or inward. Securely tighten the two clamping screws **Y2**.

Then loosen the two clamping screws **X2**, Fig. 18 in the upper feed eccentric **W2**, Fig. 18 and, to increase the stitch length, turn the regulating screw **V2**, Fig. 18 over to the left, or outward; or to shorten the length of stitch turn the screw **V2** to the right, or inward, keeping in mind that the feeding foot (upper feed) and the feed dog (under feed) should, in general, be given the same amount of feeding action. Then securely tighten the two clamping screws **X2**.

NOTE:—If the machine is equipped with a movable needle guard, this guard must be set, as instructed on page 22, whenever the stitch length is changed.

TO SET THE MOVABLE NEEDLE GUARD

The function of the needle guard D2, Fig. 19 is to prevent the needles from springing into the path of the loopers when the loopers are on their forward stroke. If the machine is equipped with a movable needle guard, the guard must be reset each time the stitch length is changed.

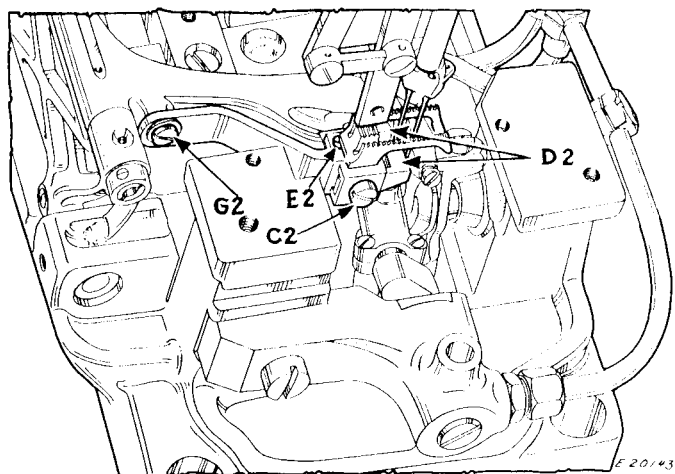


Fig. 19. Movable Needle Guard

Use **caution** when setting the movable needle guard, as it is attached to the feed bar and should be set only when the feed is all the way forward and the needles are on their upstroke.

To set the movable needle guard, loosen screw C2, Fig. 19 and move the needle guard D2 toward or away from the needles so that the guard is as close as possible to the needles without actually touching them.

Press the feed dog down upon the stop screw E2, Fig. 19, then tighten the screw C2.

TO SET THE STATIONARY NEEDLE GUARD

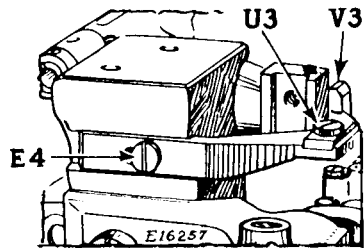


Fig. 20. Needle Guard

The function of the needle guard V3, Fig. 20 is to prevent the needles from springing into the path of the loopers when the loopers are on their forward stroke.

The needle bar should be set as close as possible to the needles, but not touch them.

To set the needle bar in correct position, loosen set screw E4, Fig. 20 and move the guard toward or away from the needles, as may be required. Then securely tighten set screw E4. The needle bar can also be adjusted to right or left, to clear the feed dog, after loosening screw U3, Fig. 20.

TO SET THE FEED DOG AT THE CORRECT HEIGHT

When the feed dog is at its highest position, practically the full depth of the teeth should project through the slots in the throat plate. The height of the feed dog is determined by the stop screw E2, Fig. 19 which, with the feed dog removed, may be turned up or down as required.

Note that the feed dog should always rest upon the stop screw E2.

TO LEVEL OR TILT THE FEED DOG

The feed dog may be leveled, or tilted to any position after loosening feed dog screw C2, Fig. 19 and screw G2, Fig. 19.

When the feed dog is in the desired position, press it down so that it rests on the stop screw E2, then securely tighten screw C2 and screw G2.

TO ADJUST THE ALTERNATING PRESSER FEET

The amount of lift of the alternating presser feet should be regulated according to the thickness of the material being sewn. The feet should lift sufficiently high to clear the material.

To increase the lift of the presser feet, loosen the screw C4, Fig. 21 and move it upward in the slot. To decrease the lift in the feet, move the screw C4 downward in the slot. When the required setting is obtained, securely tighten the screw C4.

The lift of the alternating pressers is equalized by loosening the screw Z3, Fig. 21 and moving the bracket L3, Fig. 21 up or down on the presser bar, as required, after which the screw Z3 should be securely tightened.

The feeding foot should be adjusted in relation to the drop feed, so that it does not come into contact with the lifting presser. The feeding foot can be adjusted to the required position, after loosening the screw K3, Fig. 21. When the feeding foot is correctly adjusted, securely tighten the screw K3.

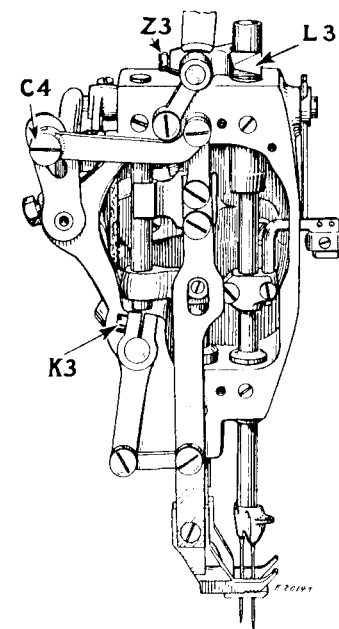


Fig. 21. Presser Feet Adjustments

TO TIME THE LOOPER THREAD TAKE-UP

See Fig. 22

The looper thread take-up **W** should be timed so that when the needles are at their highest point and the loopers are just commencing their backward stroke, or loop shedding motion, the flat, straight, part of the take-up **W** just commences to touch the threads between the two eyelets in the thread take-up staple **S**.

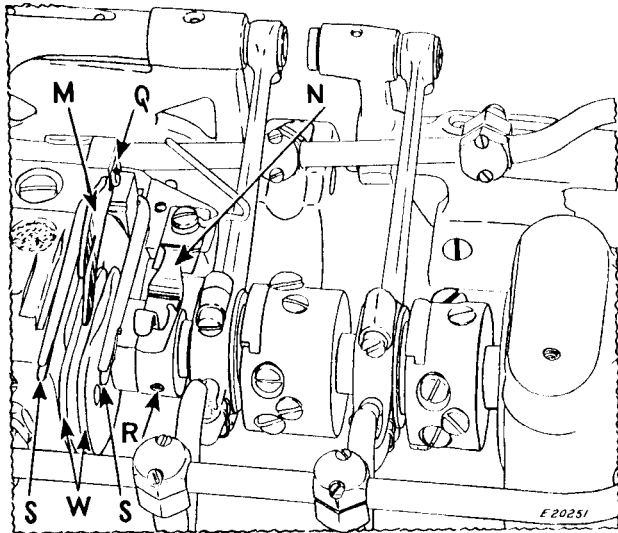


Fig. 22. Timing the Looper Take-Up

As the needles move downward, the take-up **W** should just take up the slack threads from the loopers, keeping the threads taut from the eyes of the loopers to the last stitch formed.

To time the looper thread take-up, loosen the screw which holds it in position on the rotary shaft. The looper thread take-up **W** should take the slackness out of the threads when the loopers are on their backward stroke.

CAUTION—If the looper thread take-up **W** is timed too early it will strain the looper threads causing them to break or to form a puckered stitch.

TO ADJUST THE LOOPER THREAD TAKE-UP STRIPPER

See Fig. 22

The purpose of the looper thread take-up stripper **M** is to cast the threads from the take-up **W**, after the needles have entered the triangles formed by the looper blades, looper threads and needle loops, and to hold them in this position on the take-up until the point of the looper has

entered the needle loops on its loop taking motion. At this point, the stripper should release the threads and allow them to move easily with the loopers.

To adjust, loosen the screw **Q**, at the right of the stripper and move the stripper **M** forward or backward, as required, then tighten screw **Q**.

TO TIME THE LOOPER THREAD NIPPER

See Fig. 22

The function of the looper thread nipper **N** is to prevent the take-up **W** from pulling on the thread supply instead of taking up the slack from the loopers.

The nipper cam should be timed to close the nipper **N** just before the flat portion of the take-up **W** reaches the thread between the take-up eyelets **S**, and before the take-up commences its action. The nipper cam can be correctly timed after loosening the set screw **R**, which holds it in position on the rotary shaft.

It is advisable to observe closely how the needles, on their downward stroke, pass the loops which are on the loopers. The needles should pass to the left of the loops and in the triangles.

TO CENTRALIZE THE FEED DOG IN THE THROAT PLATE SLOTS

See Fig. 23

The feed dog should be centered in the throat plate slots so that it moves equi-distant from both ends of the slots, during the feeding movement.

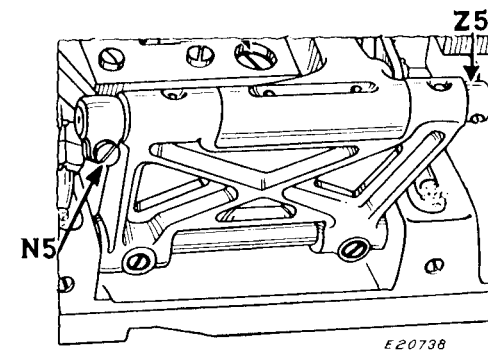


Fig. 23. Centralizing the Feed Dog

To adjust, loosen clamp screw **N5** and rotate the hinge pin **Z5**, as required, then securely tighten clamp screw **N5**.

TO ALIGN THE FEED DOG IN THE THROAT PLATE SLOTS

Loosen the three screws **G4**, Fig. 24, in the under feed eccentric **U2**, Fig. 24. Also loosen the two screws **A3**, Fig. 25, in the feed rocking frame bushings. Then tap the inside edge of the feed frame lug at **Z2**, Fig. 25, to move the feed to the left, or tap it at **Y2**, Fig. 25, to move it to the right.

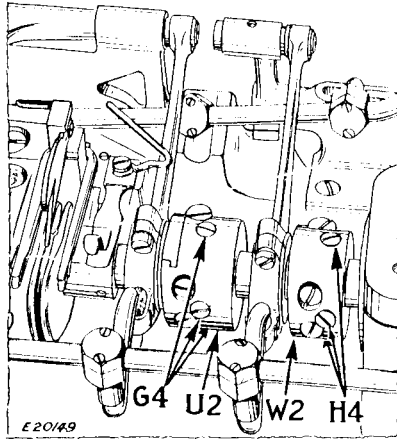


Fig. 24. Aligning the Feed Dog

Take out excessive end play by tapping the opposite bushing toward the feed frame, but use caution when making this setting, as there should be slight end play between the bushings. Then tighten the two screws **A3**.

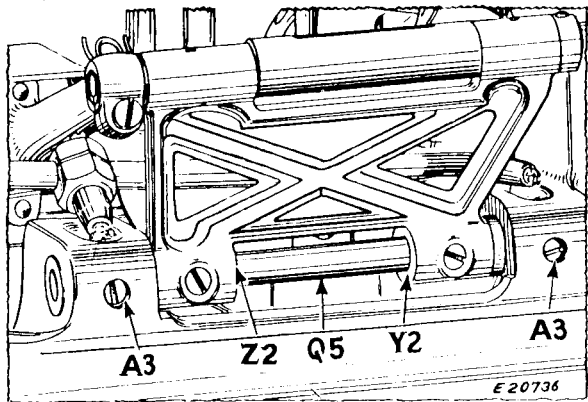


Fig. 25. Feed Rocking Frame

Turn machine pulley by hand a few times to allow the feed eccentric to align itself. Tighten the three set screws **G4** as instructed under "TO TIME THE UNDER FEED" on page 19.

TO REMOVE THE UNDER FEED MECHANISM

See Fig. 26

With the needle bar at its highest position, remove the presser foot and the feeding foot. Remove the throat plate, thread guide and cloth plate. Loosen clamping screw **N5** and, from the needle bar end of the machine, withdraw eccentric hinge pin **Z5** from the feed rocking frame.

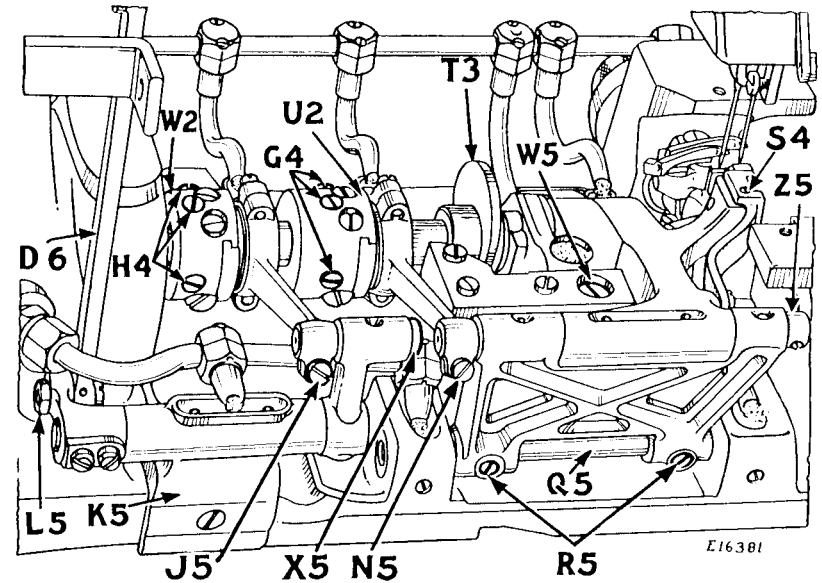


Fig. 26. Removing Under Feed Mechanism

Remove the feed bar with the feed dog attached. The feed rocking frame can then be removed, if desired, by loosening the two set screws **R5** and withdrawing the feed rocking frame hinge pin **Q5**.

TO REMOVE THE UPPER FEED REGULATOR ASSEMBLY

See Fig. 26

Take out the stud **L5**, loosen clamping screw **J5**, and disconnect the upper feed connecting rod crank. Then remove the three screws which fasten the upper feed regulator bracket **K5**, to the base of the machine, and remove the bracket.

TO REMOVE THE LOOPER MECHANISM

See Fig. 27

Remove the throat plate, cloth plate, and feed dog. Take out screw X4 and remove the looper holder together with the looper. Take out screw E4 and remove the needle guard holder. Remove the four screws W4 in the looper shaft connection and remove the cap. Remove the cap screw Y4, then insert a screwdriver into the hole and unscrew shaft Z4 from the looper carrier, and remove looper assembly.

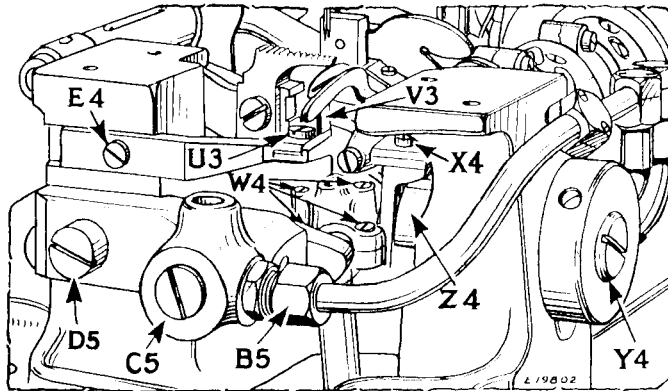


Fig. 27. Removal of Looper Mechanism

TO REMOVE THE LOOPER SHAFT

To remove the looper shaft A5, Fig. 29, loosen clamping screw N5, Fig. 28, and from the needle bar end of the machine, withdraw feed bar eccentric hinge pin Z5, Fig. 28 and remove the feed bar.

Unscrew oil coupling B5, Fig. 27, take out screw D5, Fig. 27, and remove the bracket C5, Fig. 27, then turn the balance wheel until the looper shaft screw F5, Fig. 29, is at the top.

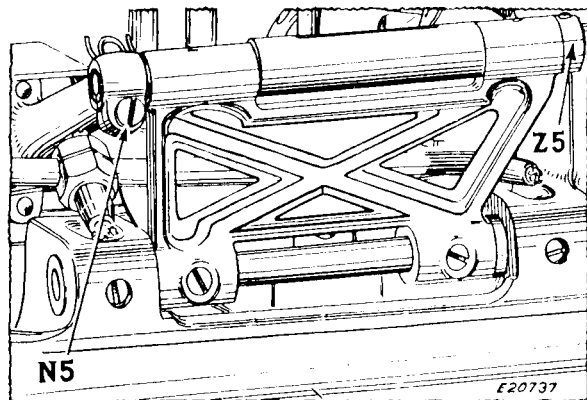


Fig. 28. Feed Bar Eccentric Hinge Pin

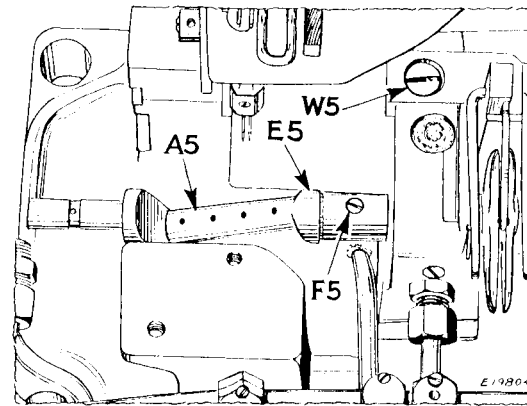


Fig. 29. Removal of Looper Shaft

Take out screw F5 and remove the looper shaft from the rotary shaft by tapping against the flange E5, Fig. 29 of the feed eccentric, with a piece of brass.

CAUTION:—Do not spring this shaft while removing or replacing it, as this may cause it to bind and heat, when the bracket C5, Fig. 27, is replaced.

TO REMOVE THE ARM ROCK SHAFT

Remove the face plate and needles, then unscrew the needle clamp from the needle bar. Loosen the set screw W3, Fig. 30, and remove thread take-up X3, Fig. 30. Loosen screw V, Fig. 30 and remove needle bar from the top of the machine.

Loosen screw A4, Fig. 30, and take out the presser bar guide B4 and presser bar lifting bracket F3, Fig. 30. Remove screws C4 and J3, Fig. 30 and take off the alternating presser mechanism. Remove the needle bar connecting link and the foot lifting lever. Take out screw Q4, Fig. 30, and remove the presser foot lifting link H3, Fig. 30, then loosen screw S3, Fig. 30, remove upper feed regulator G3, Fig. 30 and regulator connection R3, Fig. 30.

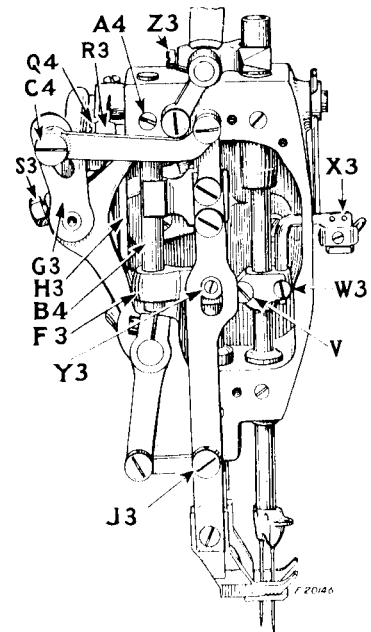


Fig. 30. Removing the Needle Bar and Presser Bar

Remove cap **P3**, Fig. 31, and screw and washer **O3**, Fig. 31, at the rear end of the rock shaft. Remove round cover plate at rear side of machine, carefully saving the gasket. Loosen the two screws **F4**, Fig. 31 in the rock shaft crank and, with the connecting rod at the midway position, withdraw the rock shaft from the needle bar end of the machine. Remove the automatic thread nipper.

TO REPLACE THE ARM ROCK SHAFT

When replacing the arm rock shaft, have the connecting rod at the midway position. Replace screw and washer **O3**, Fig. 31, in the end of the shaft and turn the machine pulley a few turns by hand to allow rock shaft crank to align itself before tightening the two screws **F4**, Fig. 31, on their flats.

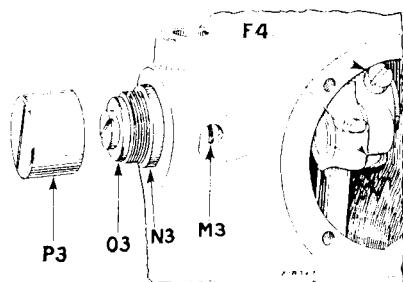


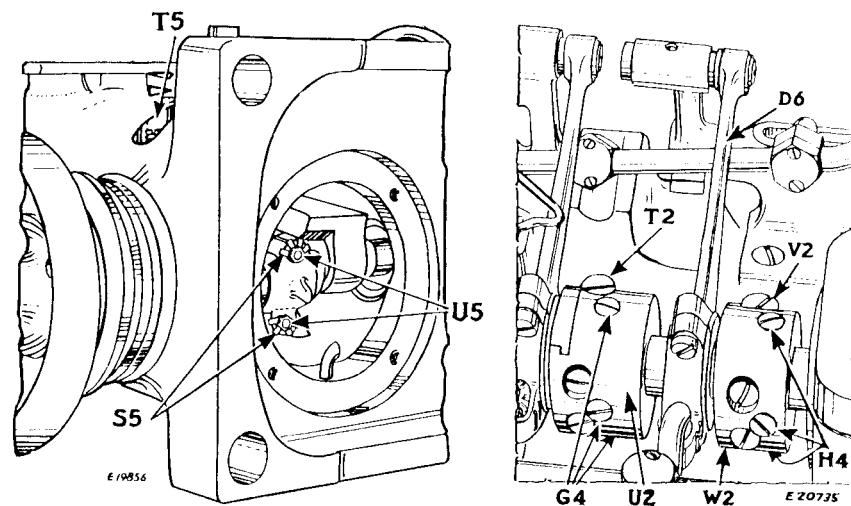
Fig. 31. Removing Arm Rock Shaft

The end play in the rock shaft is regulated by loosening set screw **M3**, Fig. 31, and moving the bushing **N3**, Fig. 31, endwise.

NOTE:—Permit a little end play in the rock shaft, when cold, to allow for expansion which occurs when the machine is warmed up.

TO REMOVE THE ARM ROTARY SHAFT

Remove presser foot and feeding foot. Remove throat plate. Remove the looper mechanism, as instructed on page 28. Take out screw **W5**, Fig. 26, page 27, and remove the stripper plate bracket together with the stripper plate. Remove under and upper feed mechanism, as instructed on page 27. Disconnect the upper end of the upper-feed rock shaft pitman **D6**, Fig. 33. Remove oil sump at under side of machine bed, being careful not to injure the gasket. Through this opening (see Fig. 32), take out the two hexagon nuts **U5**, Fig. 32, together with the lock washers **S5**, Fig. 32, and remove connecting rod cap.



Figs. 32 and 33. Removing Arm Shaft

Loosen the three set screws **H4**, Fig. 33, in the upper-feed eccentric **W2**, Fig. 33. Loosen the three set screws **G4**, Fig. 33, in the under-feed eccentric **U2**, Fig. 33. Loosen set screw in hub of looper thread take-up **T3**, Fig. 26. Loosen ball bearing case screw **T5**, Fig. 32, and remove arm rotary shaft together with ball bearing case. Tap against the machine pulley to assist in the removal of the shaft.

TO REPLACE THE ARM ROTARY SHAFT

After inserting arm rotary shaft and its ball bearing case into the machine pulley end of the machine, tighten the three set screws **G4**, Fig. 33, in the under feed eccentric. Also tighten the three set screws **H4**, Fig. 33, in the upper feed eccentric. These settings should be made in the manner described on page 19 for timing the feed.

CAUTION:—Have the flat on the ball bearing case where the ball bearing case screw **T5**, Fig. 30 will be tightened against it.

In replacing the connecting rod cap, first have the two cap screws in place, then apply the lock washers **S5**, then the hexagon nuts **U5**. Do **NOT** tighten these nuts too tightly, as this may cause binding of the shaft. When the nuts **U5** have been properly tightened, bend up the lugs of the washers **S5**.

When replacing the sump at the under side of the machine bed, see that the gasket is in good condition and that it is properly seated to prevent leakage of oil, before tightening the four fastening screws.

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