

SINGER
410W1 AND 410W100

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 the 241, 400w and 410w Machines:

TYPE A — MANUFACTURING MACHINE OIL, LIGHT GRADE

When a stainless oil is desired, use:

TYPE C — MANUFACTURING MACHINE OIL, STAINLESS, LIGHT 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.

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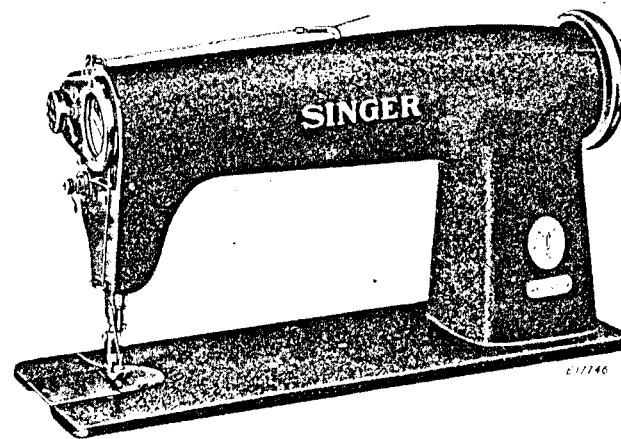
INSTRUCTIONS

FOR USING AND ADJUSTING

SINGER

HIGH SPEED

SEWING MACHINES



410w1 and 410w100

SINGLE THREAD

CHAIN STITCH

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 GENUINE "SINGER" PARTS AND NEEDLES IN "SINGER" MACHINES

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

Genuine 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

DESCRIPTION

"SINGER" 410w1 is a short arm, high speed, single needle, single thread chain stitch machine equipped with a double rotary thread take-up. The drop feed is adjustable for stitches from 4 to 30 per inch. The needle bar stroke is $1-9/64$ inches and the maximum presser bar lift is $5/16$ inch. The machine is used for basting and stitching light and medium weight fabrics.

"SINGER" 410w100 is a long arm, high speed, single needle, single thread chain stitch machine equipped with a double rotary thread take-up. The drop feed is adjustable for stitches from 4 to 30 per inch. The needle bar stroke is $1-13/64$ inches and the maximum presser bar lift is $5/16$ inch. The machine is used for basting and stitching medium and medium heavy weight fabrics.

SPEED

The maximum speed recommended for these machines is 6000 R. P. M. 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. The balance wheel turns over from the operator.

SETTING UP

The drip pan should be attached with its right end even with the right end of the cut-out and low enough in the cut-out to avoid interference with the knee lifter rod A, Fig. 2. Fig. 2 shows the correct location of the knee lifter. The knee lifter bracket should be assembled so that the lifter rod A does not strike the drip pan. The screw slots in the bracket provide the necessary adjustment. The stop stud B, Fig. 2 should be set to stop the action of the knee lifter as soon as the presser foot is raised enough to trip the hand lifter.

CAUTION: Do not start a machine, not even to test the speed, until it has been thoroughly oiled as instructed on page 4.

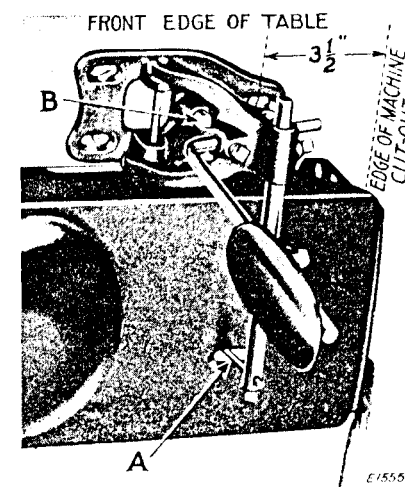


Fig. 2
Position of Knee Lifter Under Table

OILING THE MACHINE

Use "TYPE A" or "TYPE C" Oil, sold only by Singer Sewing Machine Company. (See inside of front cover).

A reservoir in the bed of the machine supplies oil to the bearings and eccentrics on the looper driving shaft (except the rear ball bearing). The other lubrication points are reached by seven oil holes, marked with red.

BEFORE STARTING THE MACHINE, fill the oil reservoir (through the oil gauge hole) to the top mark on the oil gauge **E**, Fig. 3.

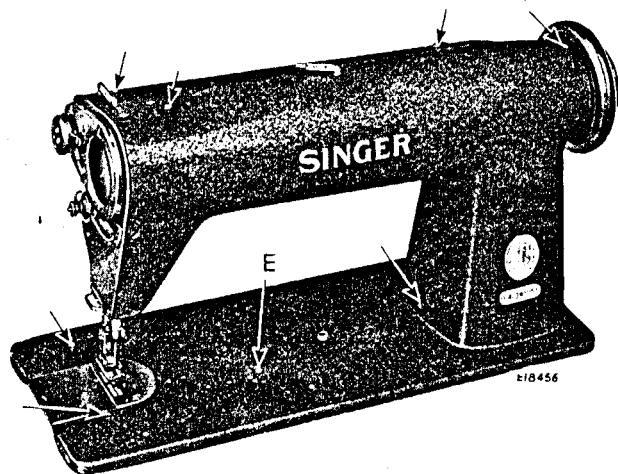


Fig. 3. Showing the Eight Oiling Points on the Machine

While it may not be necessary to add oil to the reservoir every day, the oil level must be checked daily. For short runs, the oil level should be maintained slightly above the lower mark on the oil gauge **E**. For long or continuous runs, the oil level should be maintained at the high mark on the oil gauge. Never allow the oil level to drop below the lower mark on the oil gauge.

ONCE A DAY, turn the balance wheel until the needle is all the way up, and place a few drops of oil in each of the seven oil holes indicated by arrows in Fig. 3.

NEEDLES

Needles for Machine 410w1 are of Class and Variety 135x1. Needles for Machine 410w100 are 135x9. The needles for both machines are made in sizes 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 20, 21, 22, 23, 24, 25 and 26.

The above needles regularly have nickel finish but can be supplied with chromium finish if ordered.

The size of the needle to be used should be determined by the size of the thread, which must pass freely through the eye of the needle. Rough or uneven thread, or thread which passes with difficulty through the eye of the needle, 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:

"50 No. 16, 135x1 Needles."

The best stitching results will be obtained by using the needles furnished by the Singer Sewing Machine Company.

TO SET THE NEEDLE

Turn the balance wheel over from you until the needle bar moves up to its highest point; loosen the screw in the lower end of the needle bar and put the needle up into the bar as far as it will go, with the long groove of the needle toward the left and the eye of the needle directly in line with the arm of the machine, then tighten the screw.

Genuine SINGER Needles should be used in SINGER Machines.
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UPPER THREADING

(See Fig. 5)

As soon as an operator has become accustomed to threading the machine, the thread can be passed from the thread retainer at the top, down to the needle with a single continuous motion.

Turn the balance wheel over from you until the two pins P in the rotary take-up are directly toward the front, as shown in Fig. 4 inset.

Pass the thread from the unwinder through hole 1 in the thread guide and out through the hole 2, thence through the three holes 3, 4 and 5 in the thread retainer. Hold the thread with the right hand near the thread retainer while passing the thread with the left hand, downward into the inner slot 6 (guiding it into the hole 7) and on down in front of the tension discs 8, around between the tension discs into the take-up spring 9 and under the thread pull-off 10 then over through the slot 11, allowing the thread to fall in place over the take-up discs. Now release the thread with the right hand, and pass it down through the guides (12, 13 and 14*), then from left to right through the eye of the needle 15. Leave about three inches of thread with which to commence sewing.

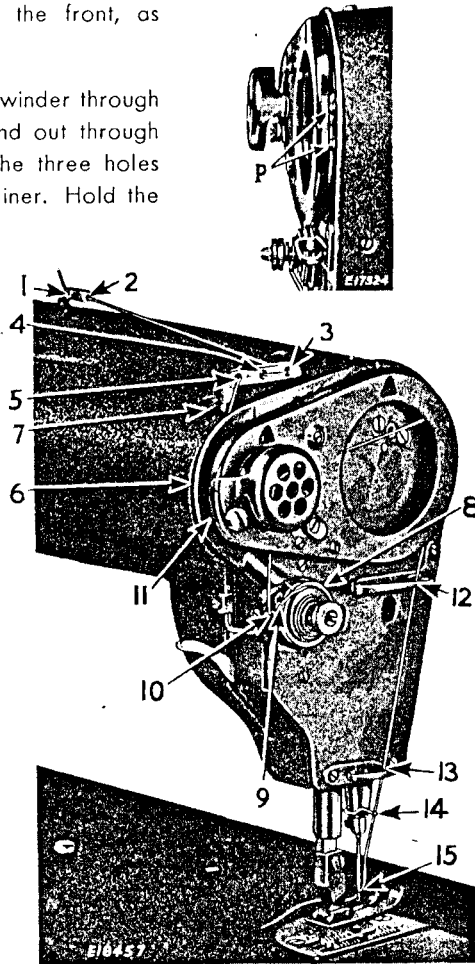


Fig. 4. Threading the Needle

*NOTE: The thread guide 14 should be turned on the needle bar bushing so that the thread leads in a straight line from the guide 13 to the needle eye. The thread retainer 5 should be turned so that the thread leads through the center of hole 7.

TO COMMENCE SEWING

Place the material beneath the presser foot, lower the presser foot and commence to sew, turning the balance wheel over from you.

TO REMOVE THE WORK

Stop the machine with the two pins P, Fig. 4 in the rotary take-up directly toward the front, as in this position the take-up will not unthread the needle when the machine is started. Raise the presser foot, draw the work to the left and cut the thread close to the material.

TO REGULATE THE THREAD TENSION

The tension on the needle thread should be regulated only when the presser foot is down. Having lowered the presser foot, turn the small thumb nut at the front of the tension discs over to the right to increase the tension. To decrease the tension, turn this thumb nut over to the left.

TO REGULATE THE PRESSURE ON THE MATERIAL

The pressure of the presser foot on the material is regulated by the screw **F**, Fig. 5 in the top of the arm. Turn this screw to the right to increase the pressure or to the left to decrease the pressure.

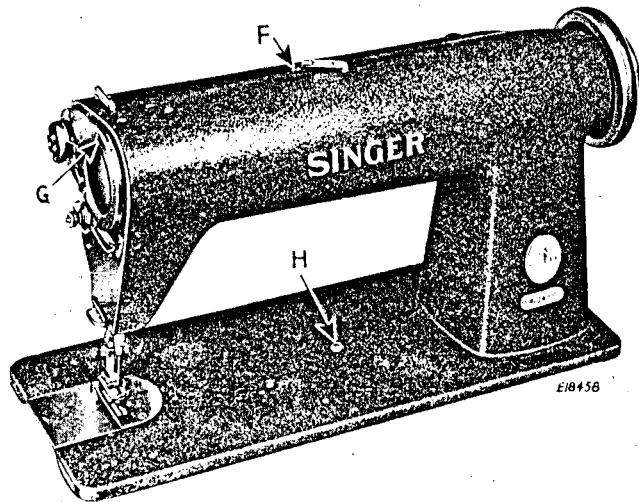


Fig. 5. Stitch Regulator and Indicator

TO REGULATE THE LENGTH OF STITCH

To change the length of stitch, press down the stud **H**, Fig. 5 in the bed of the machine and at the same time turn the balance wheel slowly until the stud enters a notch in the feed driving adjusting disc. Still holding the stud, turn the balance wheel a part of a revolution until the desired letter appears in the hole **G** over the large take-up disc, then release the stud. Do not touch the stud **H** while the machine is running.

The approximate stitch length equivalents of the letters on the take-up discs are as follows:

Letter	Approximate Number of Stitches per Inch	Letter	Approximate Number of Stitches per Inch
A	4	G	14
B	6	H	16
C	7	I	20
D	8½	J	24
E	10	K	30
F	12		

INSTRUCTIONS FOR USE OF THREAD SEVERING DEVICE

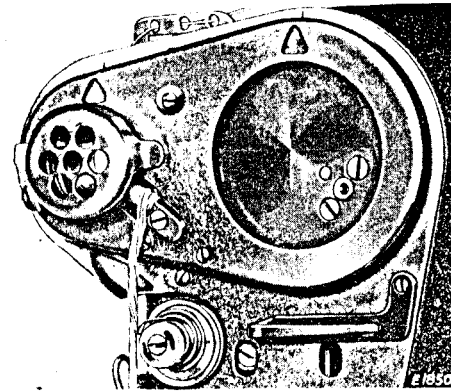


Fig. 6

When thread breaks at operating speeds, loops of thread from small take-up disc may accumulate on Thread Severing Finger, as shown in Fig. 6.

Operator grasps loops of thread and severs them across sharpened edge of Thread Severing Finger, as shown in Fig. 7.

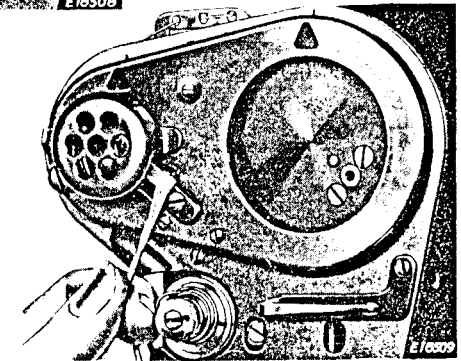


Fig. 7

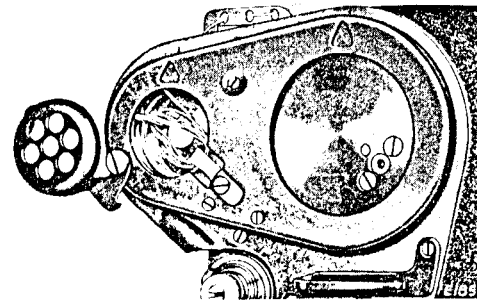


Fig. 8

At low speed, loops of thread may remain over the tapered pin of the small take-up disc. When this occurs, the operator opens the guard, as shown in Fig. 8, removes the loops from the tapered pin and severs them as described above. Usually the machine will clear itself when it is again started.

HINTS FOR PERFECT OPERATION

The balance wheel must always turn away from the operator.

Do not run the machine with the presser foot resting on the feed without cloth under the presser foot.

Do not try to help the machine by pulling the fabric lest you bend the needle. The machine feeds the work without assistance.

The slide over the looper should be kept closed when the machine is in operation.

Do not press the knee lifter lever while the machine is in operation, as this might prevent the work from feeding properly.

Occasionally remove the accumulation of lint from around the looper and from between the feed rows beneath the throat plate.

Never touch the stitch regulator stud when the machine is running.

INSTRUCTIONS

FOR

ADJUSTERS and MECHANICS

TIMING THE MACHINE

The parts are in their proper timing on the various shafts when the locating screws are in the shaft splines provided for them. These locating screws are the first screws appearing when the shafts are revolved in their normal direction of rotation.

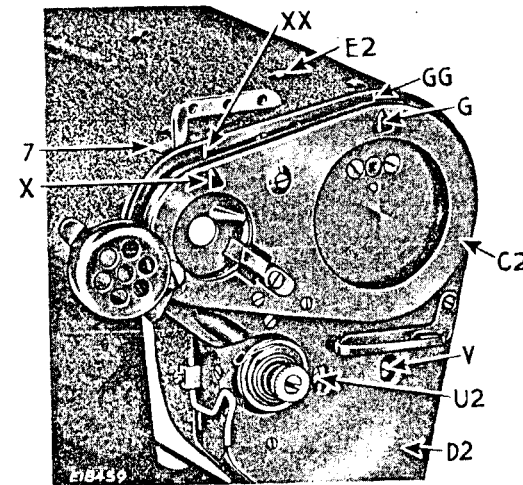


Fig. 9. Showing Timing Marks on Take-up Discs and Face Plate

The arm shaft, auxiliary take-up shaft and looper driving shaft with their component parts are in time with each other when: the arrow G, Fig. 9 on the large take-up disc is in line with mark GG, Fig. 9 on the face plate; the arrow X, Fig. 9 on the small take-up disc is in line with mark XX on the face plate; and the arrow on the collar V1, Fig. 15 is in line with the timing mark W1 on the feed lifting connection. The needle bar and looper are timed as described on pages 16 and 17.

TO ADJUST THE THREAD TAKE-UP SPRING

On Machine 410w1, the horizontal part of the thread pull-off L, Fig. 10 should be set about 1/32 to 1/16 inch below the bottom of the set screw K, Fig. 10 when the presser foot is on the throat plate. The pull-off can be raised or lowered after loosening the set screw J. Do not attempt to adjust the pull-off with the presser bar raised.

On Machine 410w100, the horizontal part of the thread pull-off L, Fig. 10 should be set about 1/4 inch below the bottom of the set screw K, Fig. 10 when the presser foot is on the throat plate.

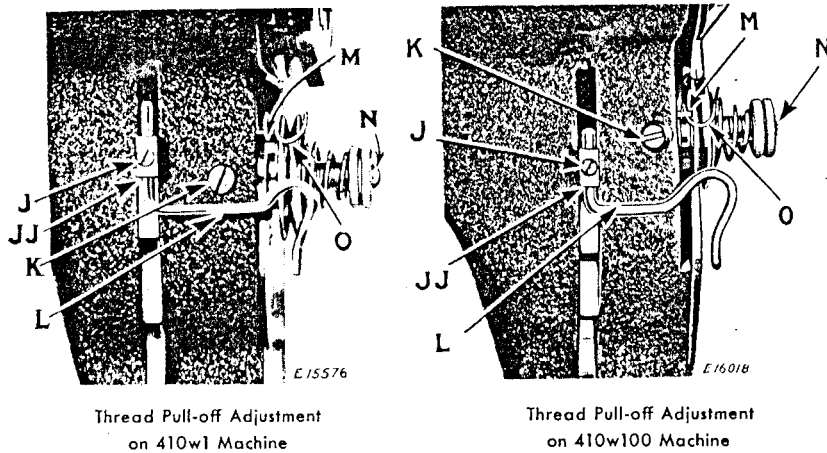


Fig. 10. Take-up Spring and Pull-off Adjustments

The take-up spring should have just enough movement so that it will be through acting and will rest against the upper end of spring regulator M when the eye of the needle is about 1/16 inch above the goods on the downward stroke of the needle. After loosening the set screw K, the tension will turn with the stud N and the spring regulator may be turned to the required position.

The tension on the thread take-up spring O is regulated by turning the tension stud N to the right to increase the tension, or to the left to decrease the tension. The tension on the thread take-up spring should be just sufficient to take up the slack of the needle thread until the eye of the needle reaches the goods in its descent.

The above instructions apply to average operation. Adjustments in both setting and tension may have to be made to suit special conditions.

PRESSER BAR ADJUSTMENTS

The presser bar bushing T, Fig. 11 should be set so that its top is about 1/32 inch below the top of the lifting bracket S when the bracket is all the way down.

The presser bar position guide U should be set about 1/16 inch above the top of the lifting bracket S when the presser foot is down on the throat plate. The spring between the guide U and bracket S cushions the action of the lifting bracket.

To align the presser foot with the needle, loosen screw U2, Figs. 9 and 11 and move presser foot to the desired position.

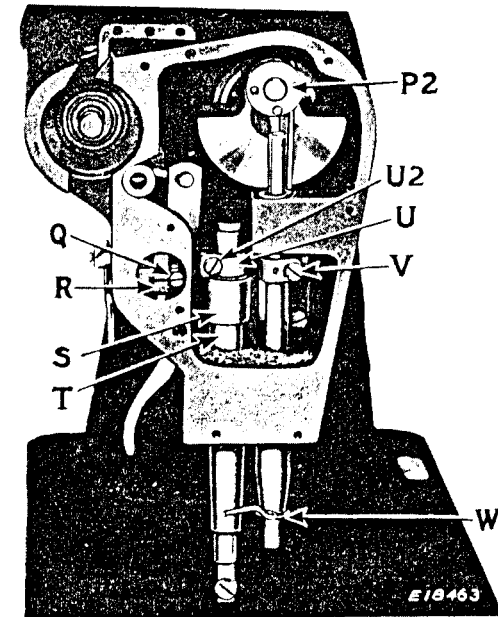


Fig. 11. Face Plate Removed

ADJUSTMENT OF THE TENSION RELEASER

The tension releaser R, Fig. 11 automatically releases the spring pressure on the tension discs when the presser bar is raised. The releaser may be moved up or down to release the tension earlier or later, by loosening the screw Q.

TO SET THE NEEDLE BAR AT THE CORRECT HEIGHT

When the needle bar is at its highest position, the lower timing mark on the needle bar, which is about $\frac{1}{2}$ inch from its lower end, should be just visible at the lower end of the needle bar bushing **W**, Fig. 11. If the needle bar is not correctly set, loosen the screw **V**, Figs. 9 and 11 in the needle bar connecting stud and move the needle bar to the correct position.

TIMING THE LOOPER

First see that the needle bar is set correctly as instructed above. Remove presser foot, slide plate, throat plate and feed dog.

To determine whether the looper is correctly timed, place a new needle in the machine, then turn the balance wheel over from you until the needle bar has started to rise from its lowest position and the upper timing mark **B1**, Fig. 12 is just visible at the lower end of the needle bar bushing at **B1**, Fig. 12. With the needle bar in this position, the point of the looper should be at the center of the needle, as shown at **C1**, in Fig. 12.

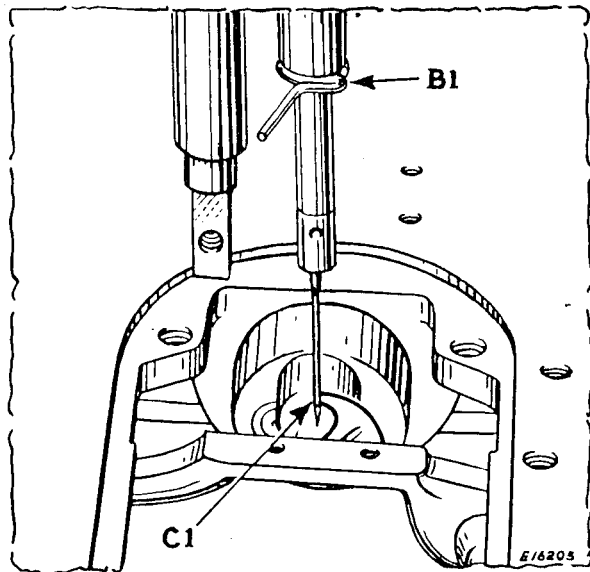


Fig. 12. Timing the Looper

If the looper is not correctly timed, loosen the screw **H1**, Fig. 13 in the looper hub. Turn the looper **G1**, Fig. 13 to bring the point of the looper to the center of the needle while the timing mark on the needle bar is centered with the bottom of the bushing, then tighten the screw **H1**.

The point of the looper should pass the needle as closely as possible without actually touching it. The looper should be placed in the shaft as far as it will go, but if it is necessary to move the looper sidwise, loosen the set screw **J1**, Fig. 13 and with end of a screwdriver placed in the hole at the bottom of the bushing **K1** move the looper assembly to the right or left as required.

TO REMOVE THE LOOPER

Take out the needle, take out the screw **Q2**, Fig. 13 and remove the needle guard **R2**, Fig. 13. Loosen the screw at **H1**, Fig. 13 and turn the balance wheel over from you until the feed bar **F1** is raised to its highest point. The looper **G1** can then be removed.

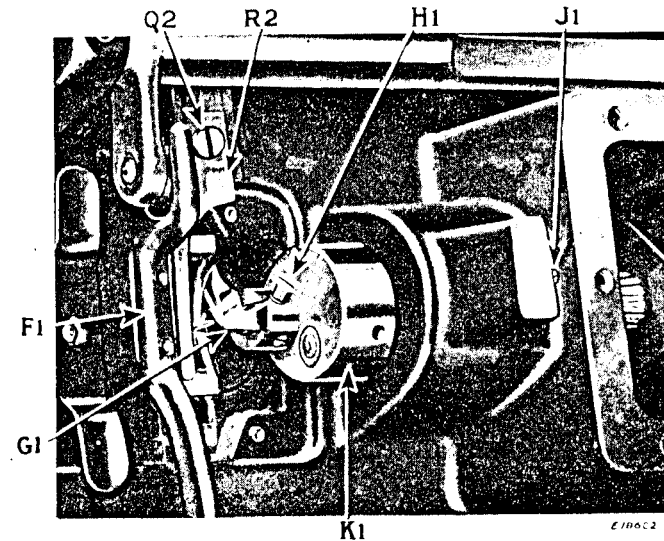


Fig. 13. Removing the Looper

After replacing the looper, replace the needle guard **R2** and the needle guard screw **Q2**, replace the needle and time the looper as instructed on page 16 and above.

TO REMOVE AND REPLACE THE LOOPER DRIVING SHAFT

Slip the belt off the lower pulley Y1, Fig. 14, then loosen the two set screws X1 and remove the pulley from the shaft. Loosen the four set screws U1 and P1 in the feed driving and feed lifting eccentrics, and the two set screws R1 in the driving gear. Do not loosen the screw in the collar V1. Withdraw the shaft with ball bearing from the pulley end, keeping the gears Z1 in mesh to insure perfect operation when reassembled.

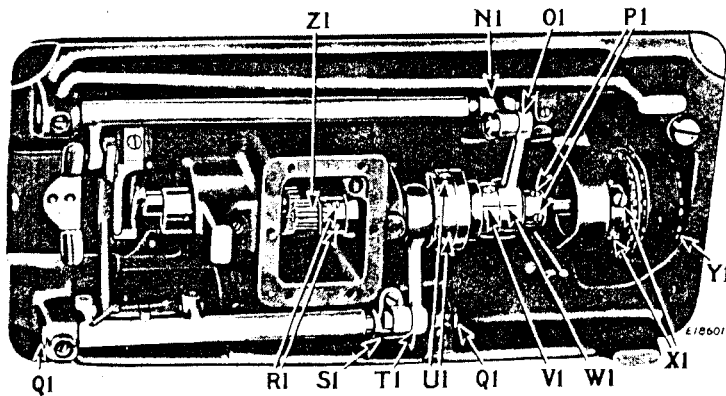


Fig. 14. Underside of Machine

When replacing the shaft, push it in, being sure the feed eccentrics are on the shaft in their proper order, until the snap ring on the ball bearing seats on the casting, then tighten gear screws R1, leaving no end play in the shaft. Before tightening the screws U1, the feed driving eccentric should be pushed to the left so as to leave only a slight amount of side play for the connection T1. Tighten the screws U1, having the first screw (as the shaft is turned away from you) enter the groove in the shaft. Then move the feed lifting eccentric to the left to leave only a small amount of side play for the connection O1 and tighten the screws P1, with the first or upper set screw in the groove in the shaft. Replace pulley Y1 and belt.

If it is found necessary to replace the ball bearing on the looper driving shaft, or to reset or replace the looper driving shaft bushing, note that the ball bearing is correctly positioned when the pulley Y1 is flush with the ball bearing on one side and its hub is flush with the end of the shaft on

the other. With the ball bearing in this position, place the shaft in the machine and fasten the gear Z1 with its left face flush with the face of the idler gear, then set the bushing against the hub of the gear to eliminate end play.

If the feed rock shafts have been disturbed, the small ends of the connections O1 and T1 should be disconnected while setting the eccentrics, and enough side play left for the connections so that their free ends can be moved sidewise about 1/32 to 1/16 inch. See paragraph on feed mechanism before assembling the rock shaft connections.

FEED MECHANISM

If a faster or slower feed timing than the standard setting is desired (see page 13), loosen the pulley screws X1, Fig. 14 and turn the shaft as desired, then tighten the screws. The looper must then be retimed as instructed on pages 16 and 17.

The feed dog is lined up with the slots in the throat plate by moving the bearing centers at Q1, Fig. 14 to right or left. It may be centered lengthwise so it will not strike the ends of the slots when making the longest stitch, by loosening the clamp screw in the feed rock shaft crank S1, Fig. 14.

After removing the feed driving or feed lifting rock shafts, the cranks S1 or N1, Fig. 14 should be adjusted to right or left until they line up perfectly with the free ends of the connections when the latter are exactly midway between their two extreme side play positions. The cone bearings O1 and T1, Fig. 14 should then be adjusted by first turning the cone screws down tight and then backing them off one quarter of a turn, locking them in position with the lock nut. This gives a perceptible amount of play in the connection which is necessary for oil clearance.

SETTING THE FEED DOG AT THE CORRECT HEIGHT

The feed dog may be raised or lowered by loosening the pinch screw in the feed lifting crank N1, Fig. 14. The feed dog is usually set so that it shows a full tooth above the throat plate when at its highest position. See that there is no lint packed between the feed dog and throat plate.

ADJUSTING THE FEED ECCENTRIC

The feed eccentric is provided with a gib L2, Fig. 15 which can be adjusted to take up any loose motion between the feed eccentric and the eccentric body. To adjust the gib, loosen the two locking screws K2, Fig. 15 nearest the gib, then turn in the two adjusting screws J2, Fig. 15

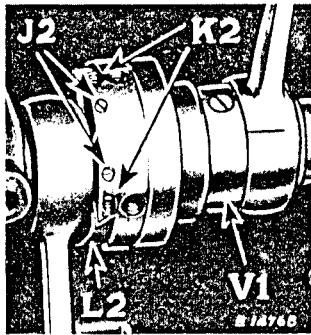


Fig. 15. Feed Eccentric

against the gib until all play is eliminated and the eccentric fits snugly in the slot in the eccentric body. Securely tighten the two locking screws K2. By tightening the adjusting screws J2 firmly, the eccentric will be locked so that the stitch length cannot be changed by unauthorized persons.

A spring held by the collar V1, Fig. 15 presses against the feed driving eccentric adjusting disc to prevent it from moving out of position while the machine is operating. The collar V1 should ordinarily be set flush with the end of the hub of the eccentric body. The set screw in this collar must enter the timing groove in the eccentric body.

TO REPLACE THE ARM SHAFT CONNECTION BELT

Remove the needle to avoid damaging it while the arm and looper shafts are out of time. Work the belt off the lower pulley Y1, Fig. 14.

Take out the two screws at the right end of the balance wheel and remove the cap. Loosen the two screws in the hub and remove the balance wheel and the ball bearing which comes out with the wheel. Lift the belt up and draw it out around the arm shaft through the space normally occupied by the ball bearing.

Replace the belt through the ball bearing hole. After placing the belt over the upper pulley M2, Fig. 16, replace the balance wheel. To remove

all end play from the shaft, lightly tighten the set screws in the balance wheel and, holding the needle bar crank in place, tap the balance wheel into position with the palm of the hand; then tighten screws firmly. Turn the arm shaft until the arrow G, Fig. 9 on the take-up disc is in line with its timing mark GG, Fig. 9, and turn the lower pulley until the timing mark on the collar V1, Fig. 14 is opposite the mark W1, Fig. 14. With the two shafts in this position, lead the belt onto the lower pulley at the point farthest from you and then, while turning the balance wheel over from you, slide the belt over the rest of the width of the lower pulley. Check the timing of the machine before starting to sew (see page 13), and if necessary, loosen the set screws in the lower pulley to bring the upper and lower shafts into exact time.

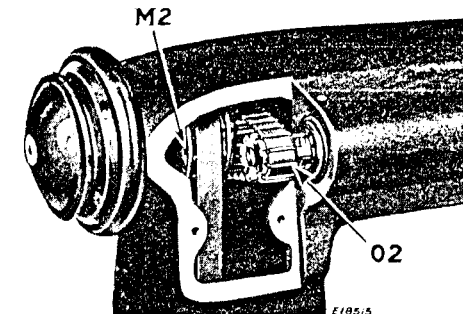


Fig. 16. Rear Arm Cover Removed

TO REMOVE AND REPLACE THE SMALL TAKE-UP SHAFT CONNECTION BELT

Remove the arm shaft connection belt as instructed above, then slip the take-up belt O2, Fig. 16 off the pulleys, being careful not to place too much sidewise strain on the arm shaft while it is unsupported by the rear bearing. When replacing the belt, have the arrows G and X on both take-up discs in line with their respective timing marks GG and XX as shown in Fig. 9. Replace the small belt O2, Fig. 16 on both pulleys, then replace the long belt as instructed above.

TO REMOVE AND REPLACE THE SMALL TAKE-UP SHAFT

The small take-up shaft must be removed from the balance wheel end of the machine. Remove the take-up belt **O2**, Fig. 16 as instructed on page 21. Remove the take-up guard **C2**, Fig. 9 and loosen the set screw, through the hole **7**, Fig. 9 in the top of the arm, which holds the small take-up disc. Remove the shaft with the rear ball bearing and the pulley intact.

The front and rear ball bearings for replacement on the small take-up shaft will be a tight fit. The front bearing should be placed on the shaft before it is assembled on the machine. To get the correct position, force it on the shaft until flush with the hub of the small rotary take-up and after placing the shaft in the machine with the snap ring of the front ball bearing against its seat, force the rear ball bearing on until all end play has been eliminated.

When replacing the belt **O2**, make certain that the set screws in the pulleys are accessible when the take-up discs are at their timing positions.

TO REMOVE THE ARM SHAFT

The arm shaft must be removed from the face plate end of the machine and under no circumstances should an attempt be made to separate the needle bar crank from the shaft, as they are manufactured as a unit for accuracy. Remove the face plate and associated parts. Remove the needle set screw. Loosen the needle bar pinch screw **V**, Fig. 11, remove the needle bar through the top of the arm, and remove the needle bar connecting stud. Remove the needle bar crank stud **P2**, Fig. 11 by loosening the two set screws, reached through hole **E2**, Fig. 9 in the top of the arm. To remove the needle bar connecting link, drop it to its lowest position, draw forward out of the guide block, turn at right angles, then draw upward and outward. (If for any reason the needle bar guide block is disturbed, it must be aligned properly when assembling the machine). Remove the belts as instructed in the preceding paragraphs, loosen the spot screw and set screw in pulley **M2**, Fig. 16 and withdraw the arm shaft and crank from the needle bar end. If it is found necessary to replace the ball bearing, it should be forced onto the shaft until the slip ring side is flush with the needle bar crank.

INSTRUCTIONS ON BALL BEARINGS and NEEDLE BEARINGS

There are five ball bearings and seven needle bearings in this machine that will give long, trouble-free life with reasonable care. Oiling instructions given on page 4 should be followed carefully. Care should be taken to see that no foreign matter gets into these bearings when handling them out of the machine.

The ball bearings on the forward end of the arm shaft, the rear end of the small take-up driving shaft, and the rear end of the looper driving shaft are forced on into their correct position at the factory and should not be removed for replacement. When replacing them, make certain that the shielded side is always out and that they are a tight fit on their respective shafts.

The ball bearing on the balance wheel is also a forced fit. Tools for removing the balance wheel and this bearing from the machine can be procured from the Singer Agencies if needed.

The seven needle bearings should receive the same care as the ball bearings and should not be removed from their respective housings except for replacement. They should be replaced by pressing on the numbered end of the outside shell, as any pressure on the unnumbered end of the shell will distort them and cramp the bearings. After this, care should be taken to see that the needle bearings roll freely in their respective housings.