

OPERATING INSTRUCTIONS

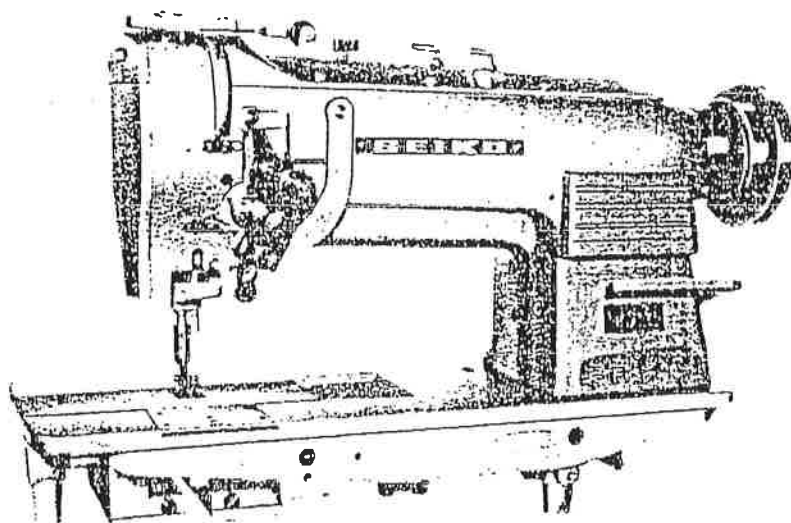


SEIKO

MODELS

LSW-27BLK LSW-28BLK

LTW-27B, -27BK, -27BM



SEIKO SEWING MACHINE CO., LTD.

Specifications (LSW-□)

Variety	28BLK	
Number of needle	Two needle	
Max. sewing speed	2,400(s.p.m.)	
Max. stitch length	1/4" (6.5 mm)	
Clearance under presser foot	by knee	33/64" (13 mm)
	by hand	21/64" (8.5 mm)
Needle bar stroke	1-9/32" (32.6 mm)	
Needle(standard)	DPx17 (#22) , 135x17 (#140)	
Thread	#8 (standard)	
Hook	Large vertical axis hook (2.0 times)	
Amount of lift of walking foot	1/8"-15/64" standard 5/32" (3 - 6 mm) (standard 4 mm)	
Thread take up lever	Slide type	
Lubrication	Semi-automatic lubrication	
Bed size	20-25/64"x 7" (518 x 177 mm)	
Working space	10-5/32"x 4-21/64" (258 x 110 mm)	
Motor	Clutch motor	
Net weight(Head only)	35Kg	

NOTE

- (1) Speed depends on threads, materials and type of operation
 (2) Specifications subject to change without notice

Needle gauge list

Variety	Needle gauge size
28BLK	1/8"(3.2 mm), 3/16"(4.8 mm), 1/4"(6.4 mm), 5/16"(7.9mm), 3/8"(9.5mm), 7/16"(11.1mm) 1/2"(12.7mm), 9/16"(14.3mm), 5/8"(15.9mm), 3/4"(19.1mm), 7/8"(22.2mm), 1"(25.4mm) standard : 1/4"(6.4 mm)

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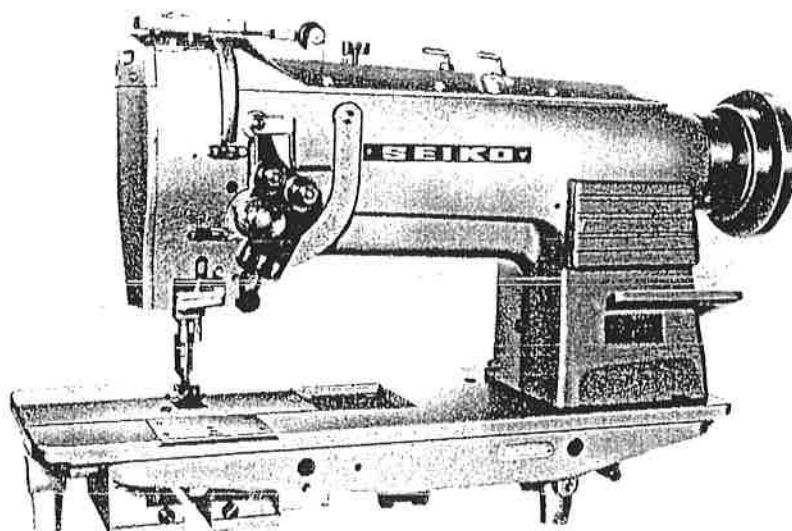
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SPECIAL INSTRUCTIONS FOR MODEL LTW-27BM20



LSW-27BLK

SETTING UP THE MACHINE

Before setting up the machine on the table, attach the relative parts to the table.

- | | | |
|--------------------|---------------------|-----------------|
| 1. Hinge | 2. Motor | 3. Oil pan |
| 4. Oil bottle | 5. Knee lifter | 6. Stand |
| 7. Treadle | 8. Machine rest pin | 9. Cotton stand |
| 10. Cushion rubber | 11. Head of machine | 12. V belt |
| 13. Bobbin winder | | |

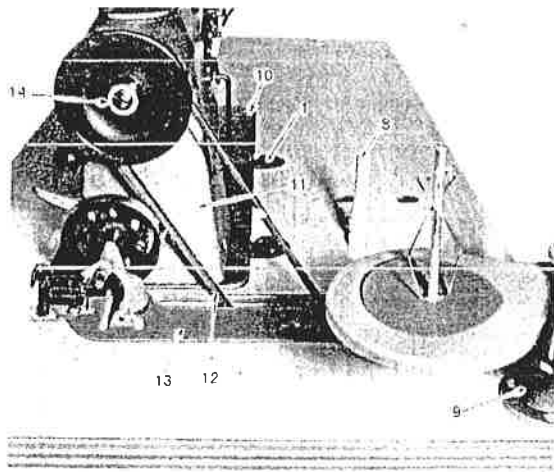


Fig. 1

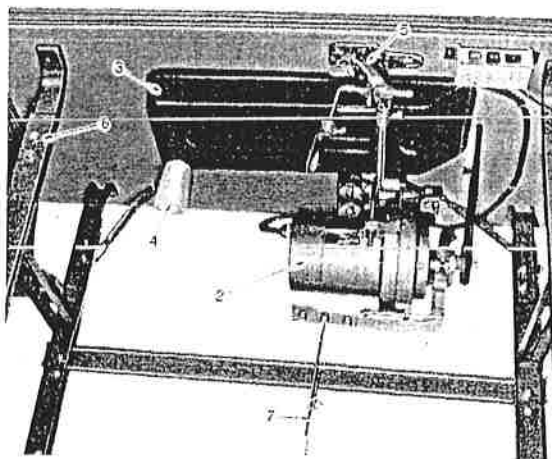


Fig. 1

OILING

Do not operate the machine, even if for testing, unless it has been properly oiled.

(1) To fill the oil reservoir on top of the machine, pour oil through the oil filler hole (A. Fig. 2) until the oil level reaches to the upper reference line in the oil window (B. Fig. 2).

Oiling is automatically made by the vibration of the machine while sewing operation through oiling wicks in the machine, and oil flow stops automatically when the operation of the machine ends.

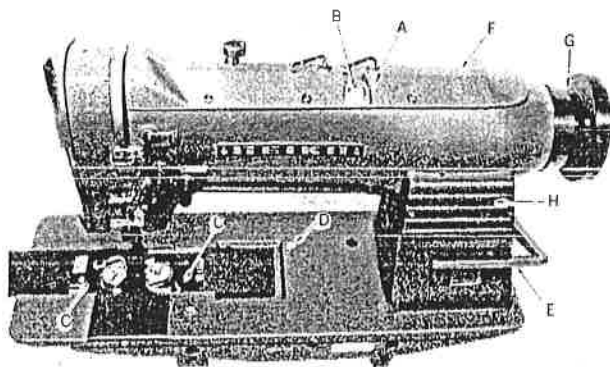


Fig. 2

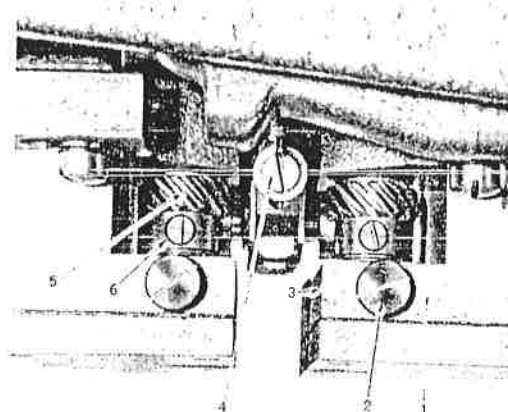


Fig. 3

(2) The hook mechanism should receive careful attention when lubricating the machine.

Push open the slide-plates in the bed and pull out the oil gauges (C. Fig. 2).

Fill oil in the reservoirs for the rotating hook mechanism up to the level marked on each oil gauge.

Care must be taken that oil flow stops when oil level falls to the bottom.

(3) Oiling adjustment to the hook mechanism.

The maximum oil flow is made when the reference line on the oil adjusting knob (2) is in a line with the point (1), and it stops when the reference line is upright.

To adjust this, loosen the pinch screw (3) and turn the oil adjusting knob, tighten the pinch screw.

OIL ADJUSTER

Oiling to inside of arm top cover is automatically made by the vibration of the machine while sewing operation.

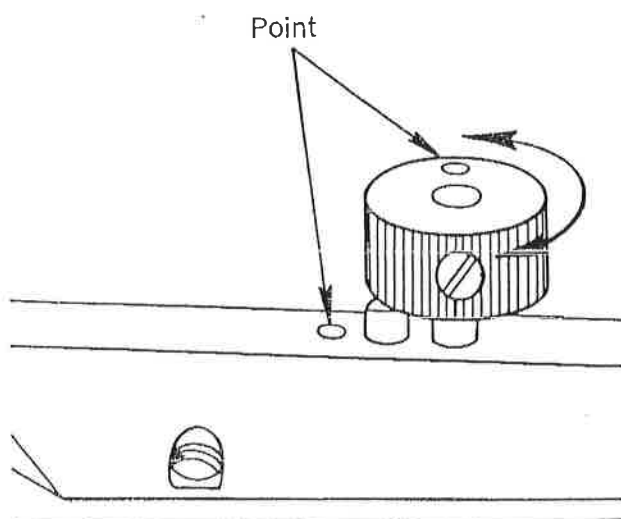
Stop oiling temporarily by the following method at your option in case of long sewing operation.

When point of the dial enters into point of arm bed cover after turning the dial, the dial goes down and oiling stops completely.

NEEDLE

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.

To insert the needle, turn the machine pulley over toward you until the needle bar (1) moves up to its highest point, loosen the needle set screw (2) and put the needle up into the needle bar as far as it will go, with the long groove of the needle toward the inside direction and tighten the needle set screw securely.



OIL ADJUSTER

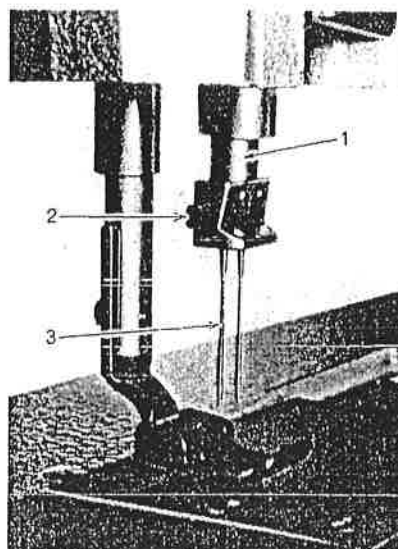


Fig. 4

THREAD

Cotton, synthetic or silk thread can be used according to your purpose.

Normally left twist thread is used, but right twist thread is recommended in the left-hand needle for perfect stitching.

INSERTING AND REMOVING BOBBINS

Raise the needle bar to its highest point and push open the slide plates (1). Pull up the latches (2) of the bobbin cases and lift the bobbins (3) out of the bobbin cases.

To insert a full bobbin in the bobbin case, hold it between thumb and index finger of your hand. Place the bobbin on the center post of the bobbin case and push down the latch (2). Be sure that the thread draws out from the bobbin from left to right.

Pull the thread into the slot (4) and between the bobbin case opener (5) and the projection (6) and under the tension spring (7). Draw out about 5 mm of the thread on the needle plate and close the slide plate leaving a sufficient space for passage of the thread.

WINDING BOBBINS AND ITS ADJUSTMENT

Push a bobbin on the bobbin winder spindle (1) as far as it will go. Pass the thread from the thread stand downward through the eye in the tension bracket, then between and around the back of the tension disc, bring the thread forward toward the bobbin and wind from below in clockwise direction several times around the bobbin.

Push the bobbin winder lever (3) downward until the wheel (2) contacts the drive belt and then start the machine.

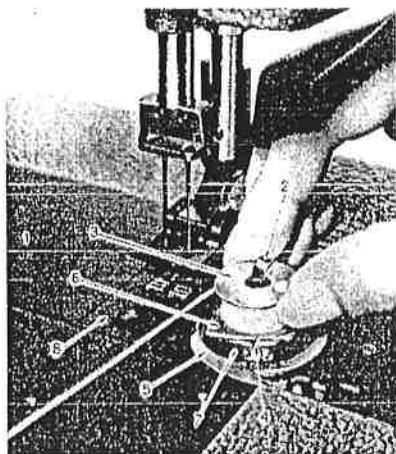


Fig. 5

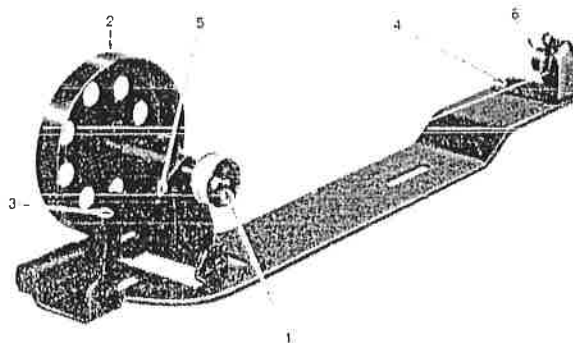


Fig. 6

After the bobbin is filled with thread, release will cause wheel to disengage from the belt and winding will stop. Cut the thread and remove the bobbin from the spindle.

Adjustment screw (5) can be turned in or out to increase or decrease the amount of thread wound on the bobbin.

When fine thread is wound on bobbins, use light tension, it is regulated by turning the knurled nut (6) on the tension bracket at the rear of the bobbin winder.

Bobbin can be wound while the machine is sewing.

If the thread does not wind evenly on the bobbin, loosen the screw (4) in the tension bracket and move the bracket to right or left as may be required, then tighten the screw.

THREADING THE MACHINE

Raise the needle bar to its highest point.

From the thread stand, lead the thread to the thread guide (1), (A) on top of the machine, down to the upper guide hole of the thread guide (2), (B) from right to left. Pass the thread in weaving fashion through the other two holes in (2), (B) and from right to left over and between the tension discs (3), (C). Now pull the thread downward from right to left beneath and around thread controller (4), (D), continue to pull the thread upward through the fork in the thread controller and against the pressure of the check spring (5), (E) and through the thread guide (6), (F) pull the thread upward through the eye in the take-up lever (7), (G) down through the thread guide (6), (F) again and then through the thread guide (8), (H) and (9), (I) down through the hole (10), (J) in the needle holder and from inside to outside through the eye (11), (K) of the needle.

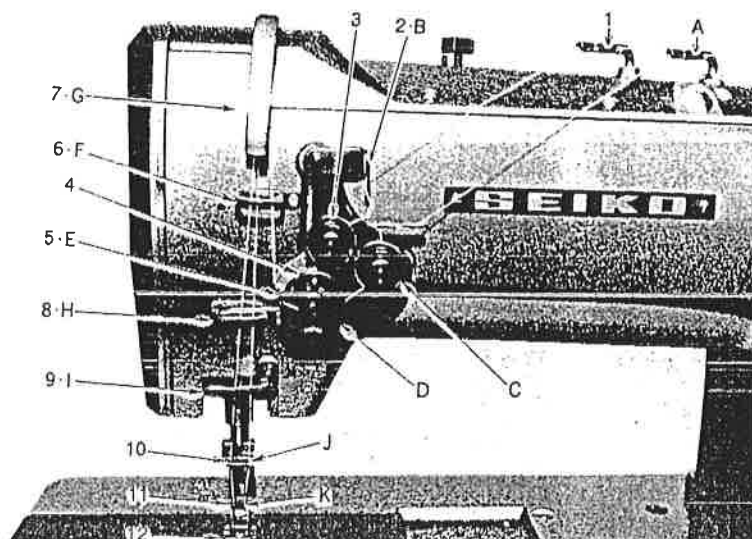


Fig. 7

REGULATING THE THREAD TENSIONS

For ordinary stitching, the tension of the upper and lower threads should be equal so as to lock both threads in the center of the fabric. If the tension on either thread is stronger than on the other, imperfect stitching will be the result.

If the tension on the upper thread is greater than that on the lower thread, it will be straight along the upper surface of the fabric.

If the tension on the lower thread is greater than that on the upper thread, the lower thread will lie straight along the underside of the fabric.

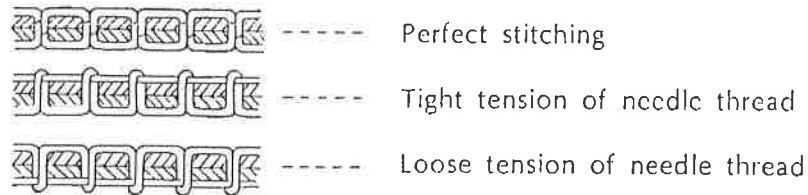


Fig. 8

A. TENSION OF THE UPPER THREAD

To adjust the tension of the upper (needle) thread, turn the serrated nut (1) to the right for increasing tension. If you desire to decrease it, turn the nut to the left.

B. TENSION OF THE BOBBIN THREAD

It is regulated by means of the tension screw (1).

To increase the tension, turn the screw to the right, and to decrease it, turn the screw to the left by a screw driver.

ADJUSTMENT OF THE PRESSER FOOT PRESSURE

The pressure of the presser foot is regulated by the adjusting screw (1).

To increase the pressure, turn the screw to the right and to decrease it to the left by a screw driver.

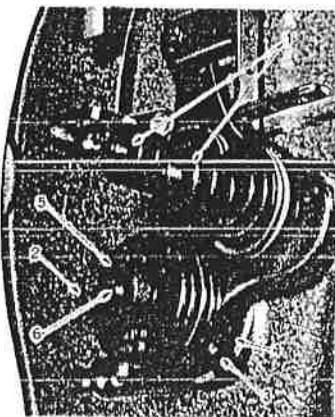


Fig. 9

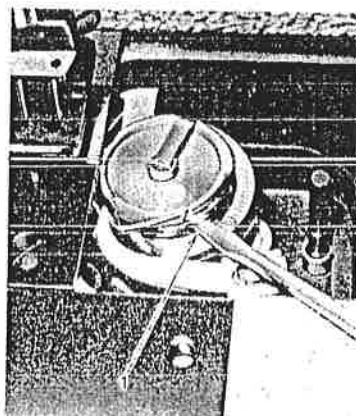


Fig. 10

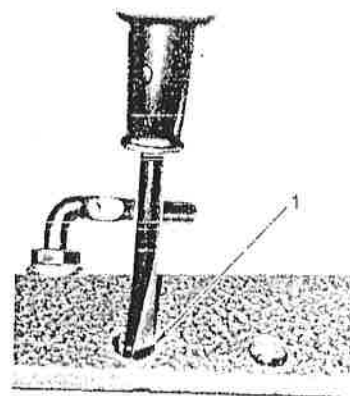


Fig. 11

ADJUSTING THE STITCH LENGTH

The stitch length is changed by pressing down the button (D, Fig. 2) in the bed plate of the machine and by simultaneously turning the handwheel slowly toward you.

In due course, the plunger will enter into a notch in the feeding mechanism. Hold the plunger down and continue to turn the handwheel, either forward or rearward, until the marking with the desired number of stitches on the handwheel coincides with the reference mark on the arm. Then release the plunger.

Numerals on pulley show number of stitch per inch	Stitch length (m/m)
5	5
6	4.2
7	3.6
8	3.2
9	2.8
10	2.5
12	2.1
16	1.6
20	1.2
24	1

REVERSE STITCH

To do tacking for the purpose of locking the ends of seams, rapidly depress and release the lever (E, Fig. 2).

When reversing feed of the machine, keep the lever (E) depressed as long as required. For all other forward stitching, the lever remains in up position.

REPLACEMENT OF THE TIMING BELT

1. INSERTING THE BELT

Turn the balance wheel toward you until the take-up lever reaches to its highest point.

Turn the lower shaft (1) until the arrow mark on the lower shaft bearing collar (2) meets with another arrow mark on the timing plate (3).

Insert a new timing belt into the belt pulley at this position.

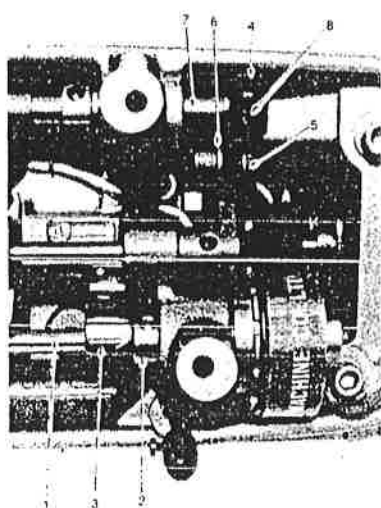


Fig. 12

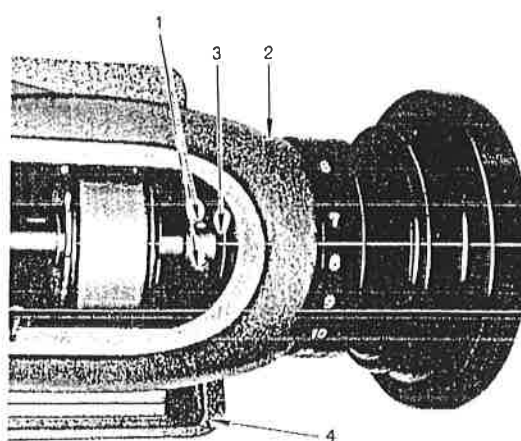


Fig. 13

2. REMOVING THE TIMING BELT

Remove the arm top cover (F, Fig. 2) and remove the timing belt from the belt pulley, loosen the collar set screws (1, Fig. 13).

Loosen the two set screws (G, Fig. 2) for the handwheel and remove the handwheel adjusting screw (14, Fig. 1). draw out the handwheel from the arm shaft.

Loosen the arm shaft rear bushing set screw (2, Fig. 13), pull out the rear bushing (3, Fig. 13) from the arm hole.

In case of the machine with reverse stitch mechanism, draw out the reverse lever (E, Fig. 2) with its shaft.

Removing or inserting the timing belt is made through the hole drawn out the rear bushing.

After inserting the belt correctly, replace the rear bushing, screws, the arm top cover, etc. to their original places. Finally, adjust the timing marks mentioned in the item No. 1.

ADJUSTING THE HEIGHT OF THE FEED DOG

The maximum height of the feed dog (1) from the surface of the needle plate (2) is normally 1 mm.

To adjust this height, tilt the machine, turn the handwheel so as to raise the feed dog to its highest point.

Loosen the set screw (4, Fig. 3) and raise or lower the feed dog as may be required.

Securely tighten the set screw.

ADJUSTING THE TIMING OF THE NEEDLE PLATE, NEEDLE & FEEDER

1. THE POSITION OF THE FEEDER AGAINST THE NEEDLE PLATE

Adjust the feed motion to the maximum and loosen the screw (4, Fig. 12). Set the position of the feeder so that both clearances A and B (Fig. 15) are equal before starting feed motion and after finishing the feed. Securely tighten the screw.

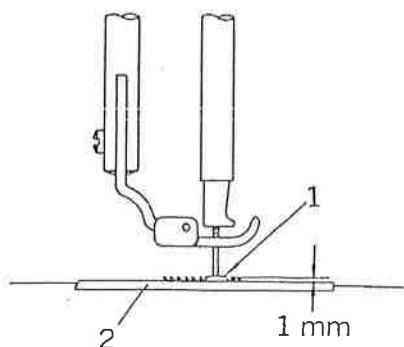


Fig. 14

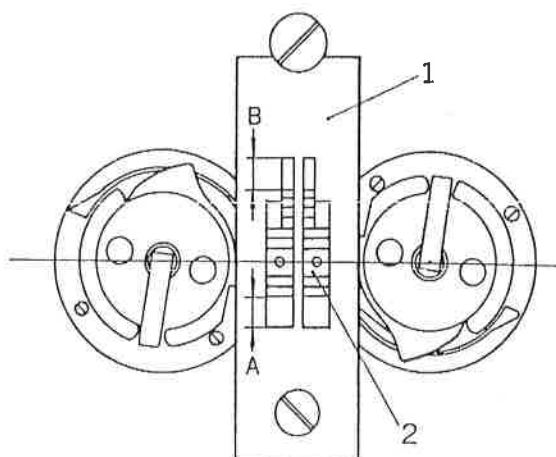


Fig. 15

2. THE POSITION OF THE NEEDLE AND NEEDLE HOLE OF THE FEEDER

To adjust this, turn the handwheel to raise the needle bar to its highest point and put correct needles.

Turning the hand wheel to lower slowly the needle bar, check whether the needle descends to the center of the needle hole of the feeder or not.

If the needle does not enter into the center of the hole, remove the side plate (H, Fig. 2) and loosen the screw (1, Fig. 16) through the window of the arm.

Holding the bottom of the needle bar rock frame (1, Fig. 17), move it as may be required to get the correct position to the center of the needle hole of the feeder.

Then, tighten the screw and replace the side plate.

ADJUSTING THE HEIGHT OF THE NEEDLE BAR

1. When the needle bar is at its highest point, normally the measurement between the surface of the needle plate and the upper end of the needle eye is 22.2 mm.

To adjust this, loosen the screw (2, Fig. 17) and move the setting position of the needle bar and the needle bar connecting stud (3, Fig. 17) to get the correct position. After this, tighten the set screw.

2. There is another method for this adjustment by setting the needle bar to its lowest point.

The normal position, in this case, is 4.1 mm approximately from the hook point to the upper end of the needle eye.

NOTE: These measurements are approximate standard, accordingly, following final adjustments are recommended.

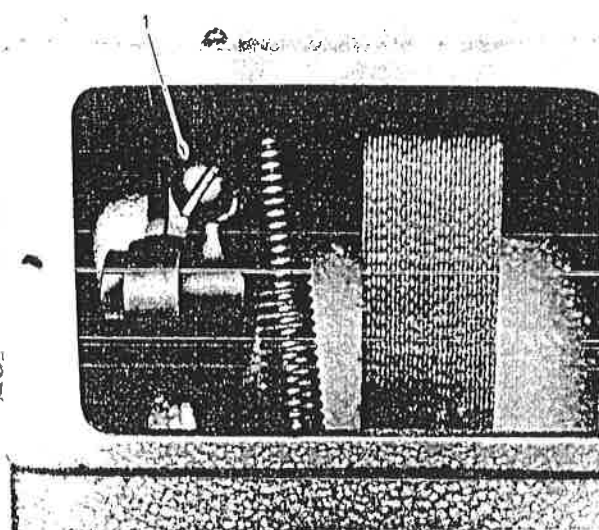


Fig. 16

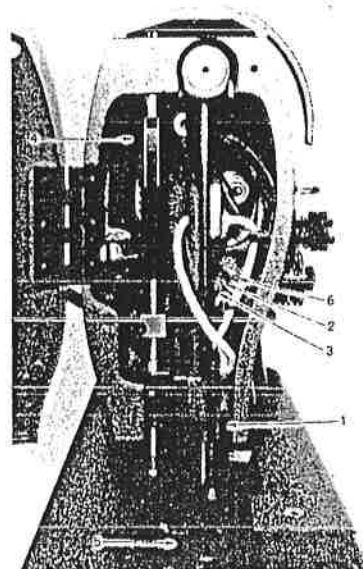


Fig. 17

TIMING BETWEEN THE HOOK AND NEEDLE

After setting the needle bar height as stated 1. or 2., confirm as under. Set the stitch length to 0, turn the balance wheel to lower the needle bar to its lowest point turn the wheel toward you, and when the needle raises 2.1 mm from the lowest point of its travel, normally the hook point is at the center of the needle, and the measurement between the hook point and the upper end of the needle eye should be 2 mm, further the clearance between the hook point and the needle hollow should be 0.05 to 0.2 mm.

If they are not measured as above, adjustments are made as follows:

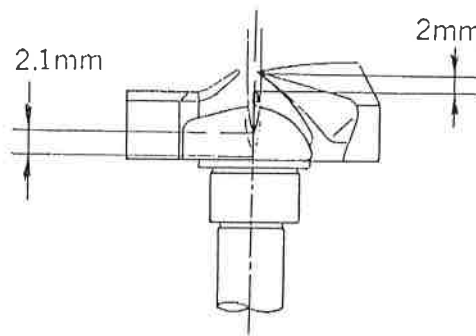


Fig. 18

TIMING ADJUSTMENT

Loosen the two set screws (1, Fig. 19A), set the position of the large gear (2, Fig. 19A) to the center of the small gear (5, Fig. 3) and tighten the two set screws securely.

Loosen the screw (6, Fig. 3) on the small gear, move the hook and set the proper timing. Then, tighten the screws securely.

For model LSW-27BLK

Loosen the two set screws (1)—Fig. 19A—, move the large drive gear (2) to right or left and set the proper timing. Then, tighten the screws securely.

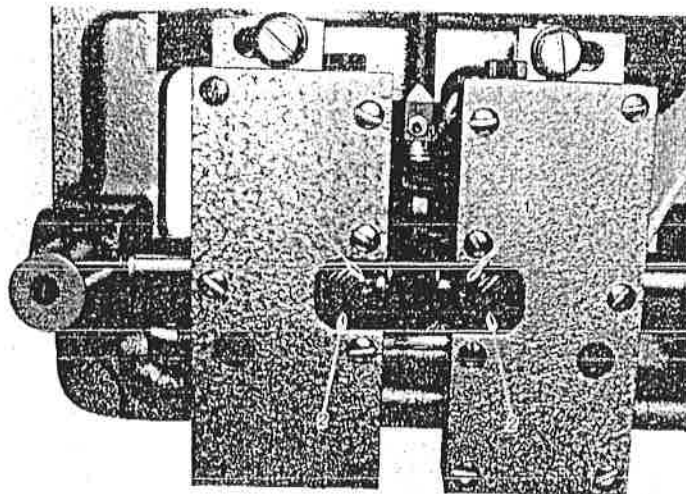


Fig. 19A

For model LTW-27BK

Loosen the three set screws (1)—Fig. 19B—, move the hook and set the proper timing. Then, tighten the screws securely.

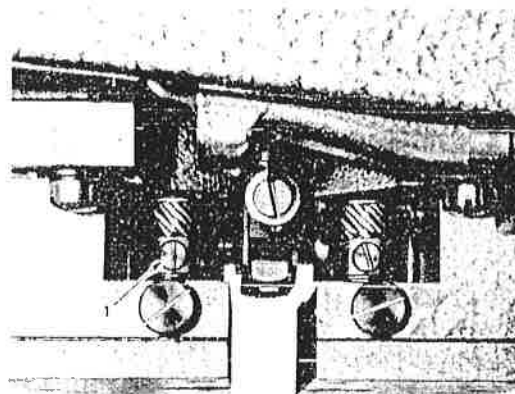


Fig. 19B

ADJUSTING THE CLEARANCE

Loosen the set screw (3, Fig. 3) and (4), move the hook saddle (5) to the right or left to get the correct clearance and tighten the screw. Be sure to use perfect needles.

RELATIVE POSITION BETWEEN BOBBIN CASE AND OPENER

Loosen the screw (1), turn the balance wheel until the opener (2) is located at the extreme right hand position of its travel.

In this position, adjust it so that the clearance between the inside edge of the opener and the tab on the bobbin case holder is about 0.2 mm.

After the adjustment, tighten the screw securely.

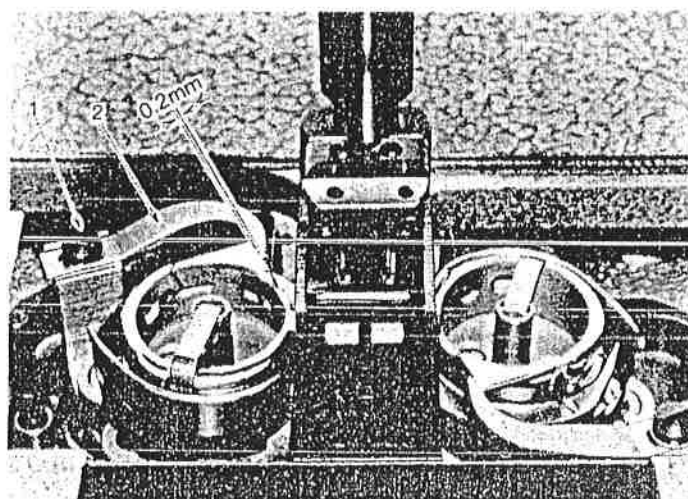


Fig. 20

ADJUSTING THE HEIGHT OF THE PRESSER FOOT

Loosen sufficiently the adjusting screw (1, Fig. 11), raise the presser bar lifter and loosen the screw (4, Fig. 17).

Move the presser foot up or down as may be required, and tighten the screws securely.

FINE ADJUSTMENT OF THE NEEDLE FEED

Ordinarily, the feed motion of the lower feed synchronizes with that of the needle feed.

If, when the motion does not synchronize, or increasing or decreasing that of the needle feed according to the sewing conditions, the following adjustments are offered.

Loosen the nut (5, Fig. 12) and bring (6, Fig. 12) close to the feed driving rock shaft (7, Fig. 12) for more feed momentum or keep away from for less momentum. Tighten the nut firmly.

CHANGING THE NEEDLE GAUGE

Remove the needle, presser foot, needle clamp, needle plate and feed dog in this order. The needle clamp is a screwed type that is removed with a pair of pliers.

Put the desired needle clamp in place by screwing it tight into the needle bar.

Loosen the needle bar connecting stud screw (2, Fig. 17) and turn the needle bar to correct the direction of the needle clamp.

Set the correct timing between the hook and the needle.

Put the feeder, needle plate and presser foot in this order securely.

SPECIAL INSTRUCTIONS FOR MODEL LTW-27BK AND LSW-27BLK

Models LTW-27BK and LSW-27BLK are specially designed as two-needle angular seam sewing machines. Model LTW-27BK employs standard size bobbins, while model LSW-27BLK uses large-capacity bobbins. Both models are equipped with devices to prevent the presence of lower thread loops when sewing seams with acute (less than 90°) angles.

NEEDLE BAR STOP MECHANISM

Pushing the needle bar change over lever (1)—Fig. 21—to either position “L” or “R” will selectively suspend the reciprocating movement of either one of the two individual needle bars.

Basically, there are two functions to this mechanism, one which causes the needle bars to operate and stop, and the other which switches from one needle bar to the other.

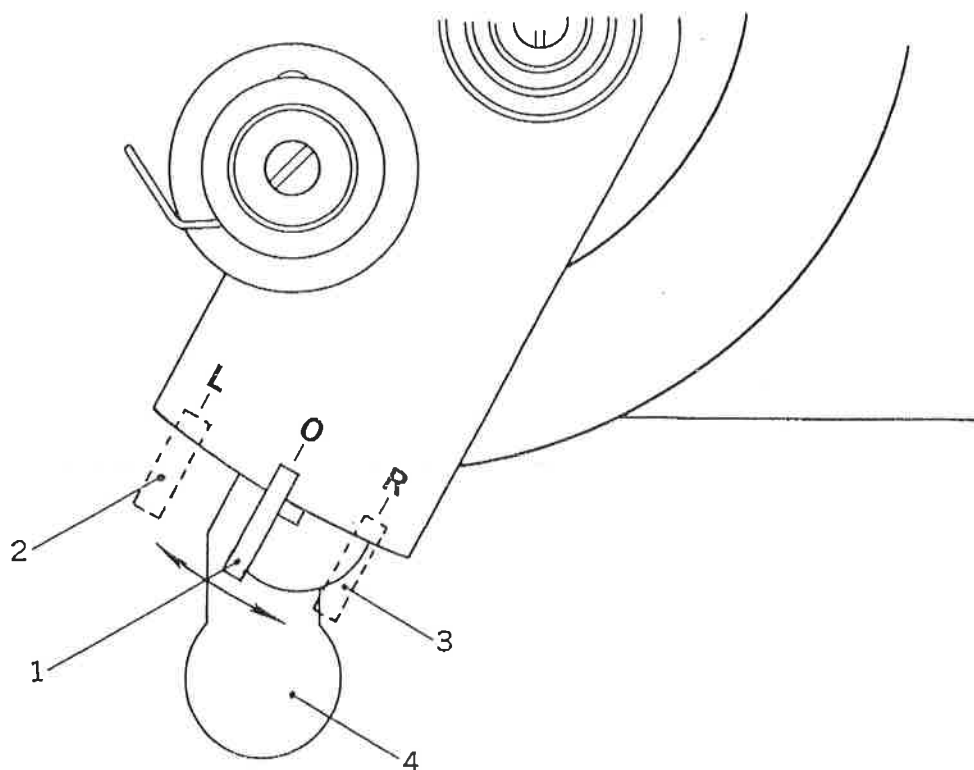


Fig. 21

A) NEEDLE BAR STOPPING AND OPERATING MECHANISM

The two needle bars individually and jointly, with the components assembled to their insides, cooperate with the needle bar connecting stud (Fig. 22) to accomplish the stopping and the operation.

The positioning of the needle bar at their upper ends relative to the needle bar connecting stud is done by means of split stop rings (2) which are inserted into grooves (1) near the top ends of the needle bars, as well as with the set screws of the needle bar position guides.

At their opposite ends the needle bars are locked to the needle bar connecting stud by means of three special high-strength steel balls expanded by a mechanism inside the needle bars beyond the diameters of the bars. Consequently, when positioned as described above and as pictured on Fig. 22, the needle bars move up and down with the needle bar connecting stud and are, what may best be described as "operational".

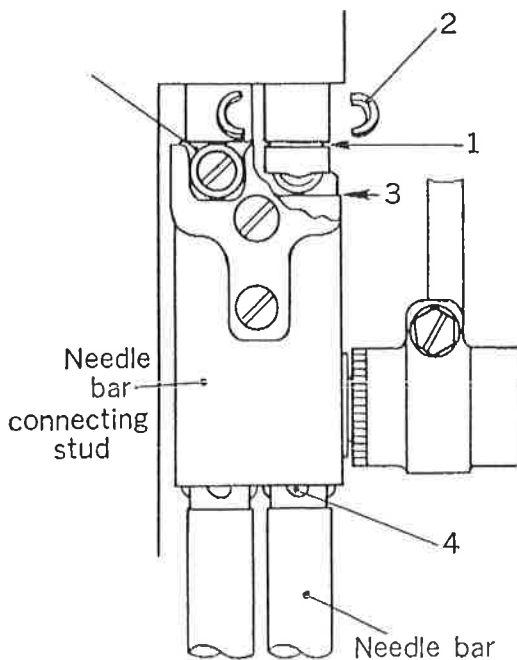


Fig. 22

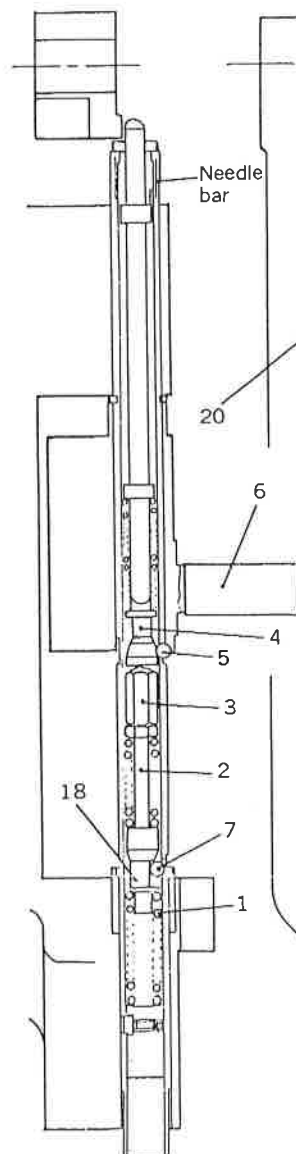


Fig. 23A

Operating mode

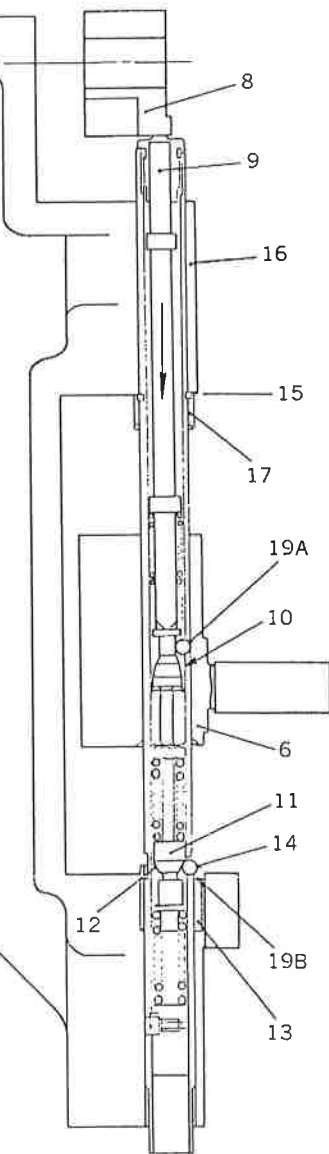


Fig. 23B

Non-operating mode

The mechanism disposed within the needle bar is detailed on Fig. 23A which shows a needle bar in the operational state, while Fig. 23B shows a needle bar in stopped position. The force of spring (1) pushes plunger (2) and adjusting nut (3) against cone (4) which in turn forces three steel balls (5) outwardly beyond the diameter of the needle bar and against the countersink at the bottom end of the needle bar connecting stud (6). At the same time triangular prism (18) is allowing three steel balls (7) to recede below the diameter of the needle bar. Consequently, the movement of the needle bar connecting stud will cause the needle bar to reciprocate.

When stopping a needle bar by moving the change over lever (1) (Fig. 21) into either the "L" or "R" positions, the mechanism locates needle bar selector block (8)—Fig. 23B—directly above the respective rod end (9). This rod end of the reciprocating needle bar now contacts the selector block causing the rod to move downward inside the needle bar causing cams (10 and 11) to likewise move downward. This allows upper balls (19A) to recede below the diameter of the needle bar while at the same time forcing lower balls (19B) outwardly beyond the diameter of the needle bars. Lower balls (19B) are now forced against the tapered mouth (14) of the needle bar bushing (13) and will stop the downward movement of the needle bar. While needle bar position guide (15) contacts the bottom of the upper end of the needle bar rock frame, thereby locking the needle bar tightly into place. At the same time the retracted upper balls (19A) do no longer lock the needle bar against the underside of the needle bar connecting stud (6) and so allow the latter to glide along the needle bar.

PREVENTION OF NEEDLE BAR ROTATION

Needle bar position guide (1) in conjunction with the bifurcated needle bar position bracket (3), attached to needle bar connecting stud (2)—Fig. 24—in conjunction with needle bar position guide plate (4) keep the needle bar from rotating. In the operating mode, bracket (3) serves this purpose, while when a needle bar is stopped the channels embossed into the guide plate (4) prevent rotation.

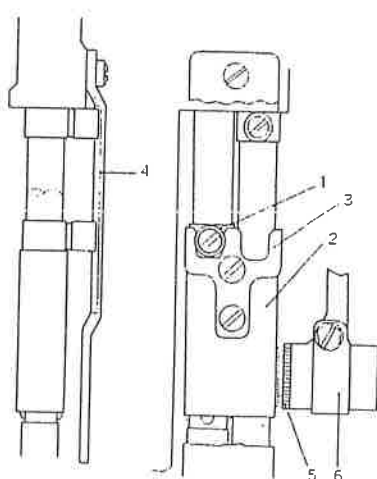


Fig. 24

VERTICAL ADJUSTMENT OF NEEDLE BAR POSITION

The exact vertical position of the needle bars is important for their trouble-free engagement and disengagement, respectively, since their positions are fixed within the needle bar rock frame (20)—Fig. 23. For the purpose of making the required fine adjustment of the needle bar position, and eccentric bushing (5)—Fig. 24—is provided in needle bar connecting link (6).

B) NEEDLE BAR RELEASE MECHANISM

When the needle bar change over lever (1)—Fig. 21—is set to either “L” or “R” position, the rod end (9) of the selected needle bar, when same is in its highest position, will contact the underside of selector block (8) causing said needle bar to become disengaged from its driving mechanism.

OPERATION OF THE NEEDLE BAR CHANGE OVER FRAME

Shifting the needle bar change over lever—Fig. 21—to “R” will cause the needle bar change over frame to move in direction of the arrow (Fig. 25).

The needle bar change over frame connection, when the needle bar lowers and was disengaged, is fixed to their normal position as Fig. 25B. At the same time, the needle bar stops when same reached in its next highest position.

When disengaging the needle bar stop pushing the lever release (4)—Fig. 21—, the needle bar change over frame and the needle bar change over frame connection return to their first position. Thereby, the slide block for needle stop separates from the needle bar stopping stud and returns to their first position.

Then, the needle bar connecting stud incorporates with the needle bar in its highest position and becomes normal twin needle operation.

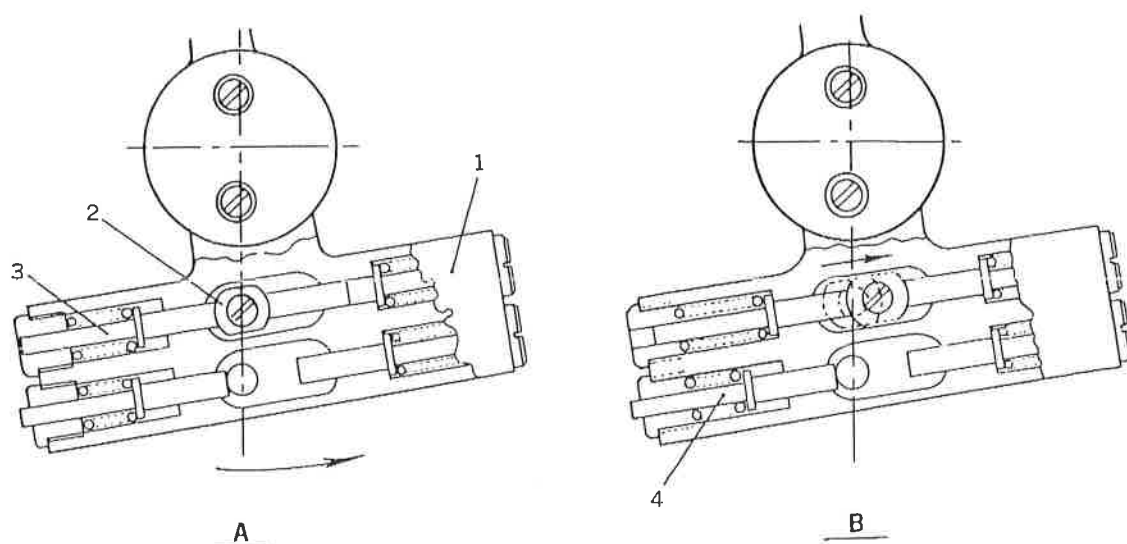


Fig. 25

the lower thread can be noticed at the underside of the work. This is caused by the transport of the material around the sewn corner, while the one raised needle bar is at rest.

The rotary hooks of models LTW-27BK and LSW-27BLK are equipped with devices which prevent the looping of the lower thread by withdrawing by means of springs any excess of thread.

Fig. 27A shows the method of threading of the bobbin case of model LSW-27BLK. Fig. 27B shows the position of thread take-up spring (1) ready to pick up any excess of thread for the prevention of loops. Also note that the dotted outline of the thread take-up spring (1A) which shows same in a rest position prior to pulling back excess thread. As can be seen from this figure, spring (1) travels a distance to where its eye coincides with the thread guide hole in retainer (2).

When in this position, further demand for bobbin thread is then pulled out from under bobbin case tension spring (3). The function and effectiveness of spring (1) is such that slack thread loop containing as much as 20 mm (25/32") of thread can be absorbed.

THREAD CONTROLLER SPRINGS

There are two separate and individual thread controller springs—one for each of the two upper (needle) threads—installed in the machines.

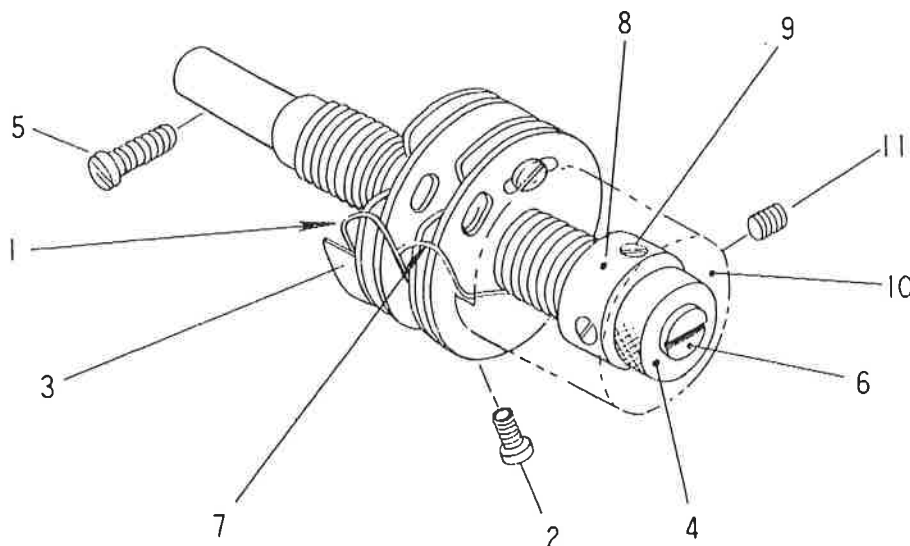


Fig. 28

When sewing angular seams with either one of the two needle bars stopped, upper thread is not drawn out at an equal rate for both needle bars. Consequently, two thread controller springs are required to cope with this condition. These springs can be adjusted individually.

A) Adjusting the rear thread controller spring

Loosen set screw (2), turn thread controller spring stop (3) to the right for more action; for less action turn stop (3) to the left and tighten set screw (2).

B) Adjusting the front thread controller spring

Loosen set screw (11) and turn spring stop (10) to the left to increase the action of thread take-up spring (7) and to the right to reduce the action of this spring. After the desired setting of the spring has been established, tighten set screw (11).

C) Adjusting take-up spring tension

- I. Slightly loosen nut (4) and also set screw (5).
- II. To adjust the tension of the rear thread take-up spring (1) place a screw driver into the slot of the take-up spring slot (6) and turn to the left to tighten the spring tension and to the right to loosen same. After the desired tension has been determined, tighten set screw (5).
- III. To adjust the tension of the front thread take-up spring (7), loosen two set screws (9) in collar (8) turning same to the left to tighten and to the right to loosen it. Upon determining the desired tension of this spring, tighten set screws (9) and also nut (4).

ADJUSTING THE HEIGHT OF THE NEEDLE CLAMPS

- I. Set stitch length to shortest stitch.
- II. Turn handwheel until needle bar has descended to the lowest point of its travel.

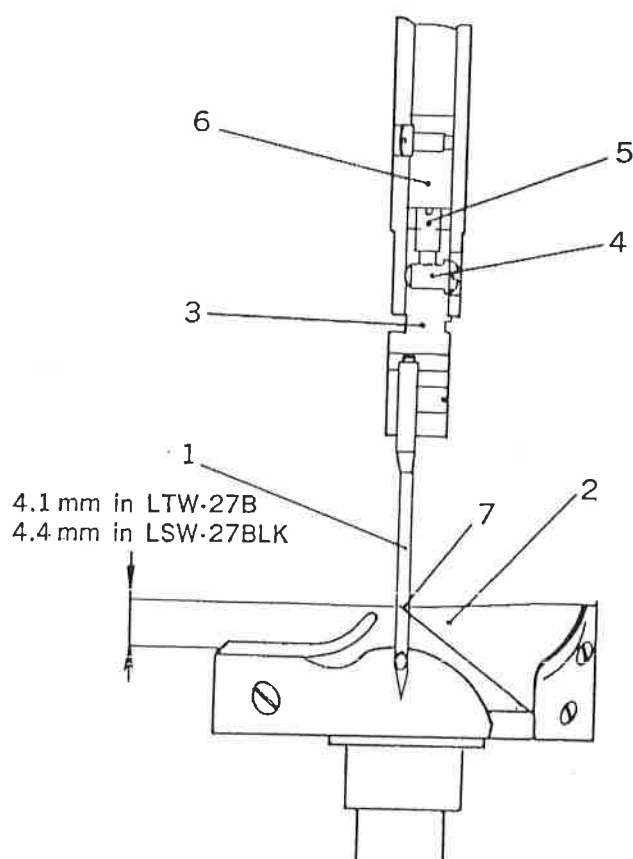


Fig. 29

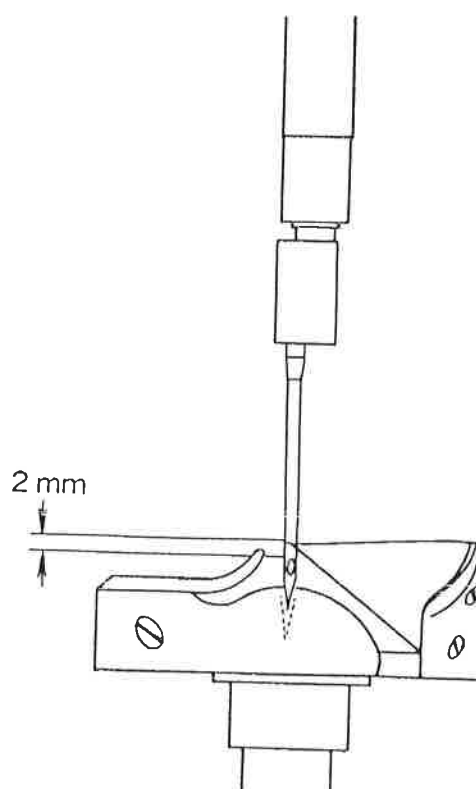


Fig. 30

- III. Turn hook only so that hook point comes to the needle as (7)—Fig. 29.
- IV. To correctly adjust the position of the needles (1) relative to hook points (2), remove the needle clamps (3) from their respective needle bars by removing needle clamp set screw (4). Upon removing the needle clamps, needle clamp adjusting screw (5) become accessible. Turn adjusting screw (5) either in or out to obtain the 4.4 mm (11/64") in LSW-27BLK (4.1 mm (5/32") in LTW-27BK) distance between the eye of the needle when at its lowest position and the hook point (Fig. 29) after the needle clamps with needles have been replaced on the needle bars.

Be sure that needle clamp adjusting screw (5) contacts the bottom of needle bar plug (6) and tighten needle clamp set screws (4).

- V. Turn handwheel toward you allowing needles to rise. When the rotating hook point crosses the centerline of the rising needle, it should be 2 mm (5/64") above the upper end of the eye of the needle. Adjust if necessary. (Fig. 30)

TIMING ADJUSTMENT OF THE LOWER STEEL BALL

Turning the handwheel, confirm whether the needle bar motion is not smooth due to projection of the lower steel ball (2)—Fig. 31—out of the outside diameter of the needle bar (3).

Normally, when the lever is changed over and the needle stop stud (1) is pushed, those parts in the needle bar begin to operate at the same time and the needle bar stops at its highest point.

Confirm in this position whether there is not a excess play on the needle bar in vertical direction.

This adjustment is made by the steel ball guide (4) and its nut (5), and the standard dimension is 30.5 mm

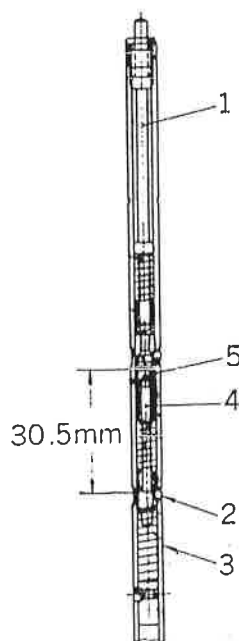


Fig. 31

SPECIAL INSTRUCTIONS FOR MODEL LTW-27BM

ASSEMBLING THE KNIFE CHANGE OVER PEDAL

1. Connect the knife change over lever (1, Fig. 32), the pedal (1, Fig. 33) and the chain (2, Fig. 33).

The proper position of the pedal is about at an angle of 20° .

2. Attach the knife releasing rod bracket (3, Fig. 33) on the underside of the table so that the hole (3, Fig. 32) of the lever (2, Fig. 32) and the hole (5, Fig. 33) of the releasing rod (4, Fig. 33) assembled to the releasing rod bracket (3, Fig. 33) are on a vertical line.

Assemble the releasing rod to be parallel with the knee lifter connecting rod (6, Fig. 33).

At the same time, adjust the length of the chain so that the releasing rod is parallel with the underside surface of the table.

3. Set the pedal extension rod (9, Fig. 33) with the screw (8, Fig. 33) to the pedal and attach the pedal extension rod (10, Fig. 33) to the releasing rod at a little to the left from the center of it. Care must be taken so that the pedal extension rod can move slightly.

4. Adjust so that there is no slack on the chain attached to the front of the pedal, and connect the two pedal extension rods with the adjusting screw (11, Fig. 33).

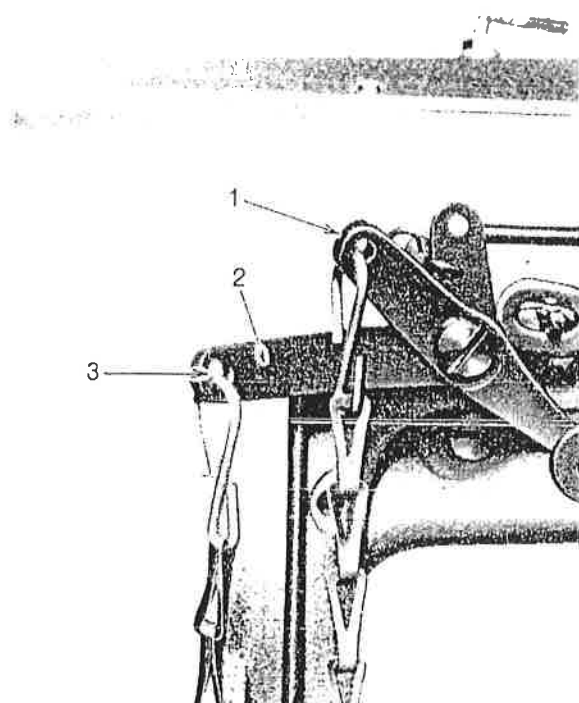


Fig. 32

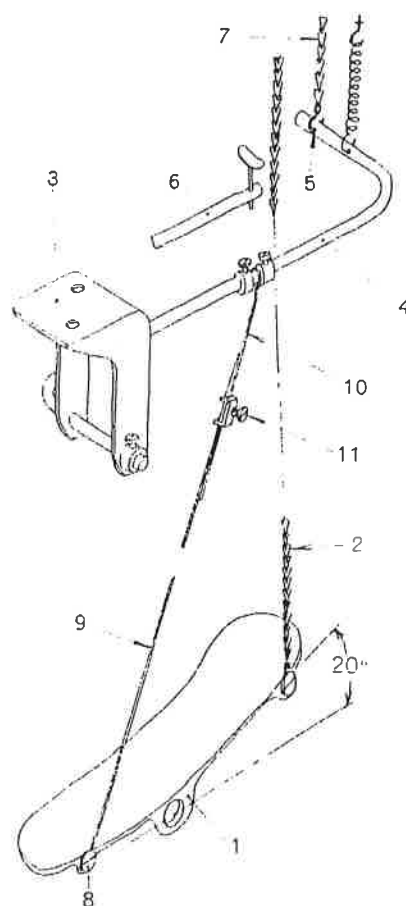


Fig. 33

KNIFE CHANGE OVER OPERATION

The operation and stopping of the knife are made by pedaling.

To operate the knife, pedal the treadle toward A direction (Fig. 34), and to stop it toward B direction.

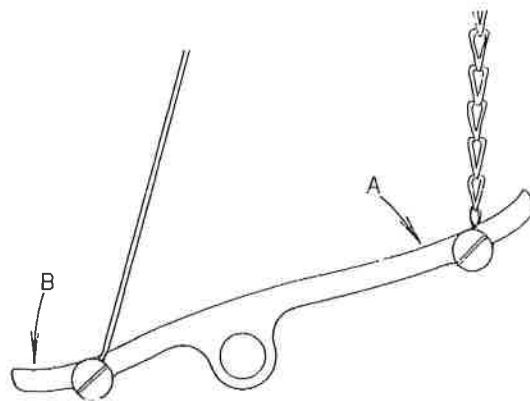


Fig. 34

REPLACEMENT OF THE KNIFE

1. To remove the knife, loosen the two screws (1) and pull down the knife (2) to remove it.
2. To replace a new knife, turn the handwheel until the knife lowers to its lowest position. Then, put the knife like the figure # 35, but adjust them so that the clearance between the surface of the needle plate (3) and the edge of the knife (2) is 1 mm as the illustration on the figure.

Securely tighten the two screws.

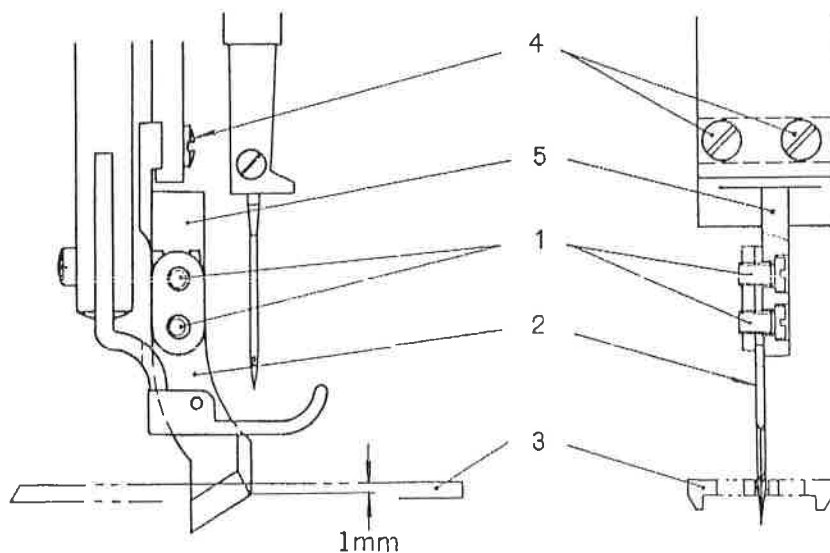


Fig. 35

ADJUSTING THE KNIFE POSITION (right and left directions)

Loosen the two screws (4, Fig. 35), adjust the knife holder (5, Fig. 35) to the right or left so that the knife lowers to the center of the groove of the needle plate.

ADJUSTING THE KNIFE CHANGE OVER POSITION

(up or down direction)

1. When fitting the knife oscillating crank, adjust the oscillating shaft (2, Fig. 36) so that the right end of the shaft comes out about 1 mm from the oscillating crank (1, Fig. 36), also, adjust the crank to actuate up or down at an equal distance starting from the horizontal line (A, Fig. 37).

Then tighten the screw (3, Fig. 36).

2. When fitting the stop collar, adjust the clearance between the end of the pin (1, Fig. 37) and the groove on the part (2, Fig. 37) is 0.5 mm, and in this position, set the stop collar (4, Fig. 36) closely to the oscillating shaft (2, Fig. 36), then tighten the collar set screw (5, Fig. 36).

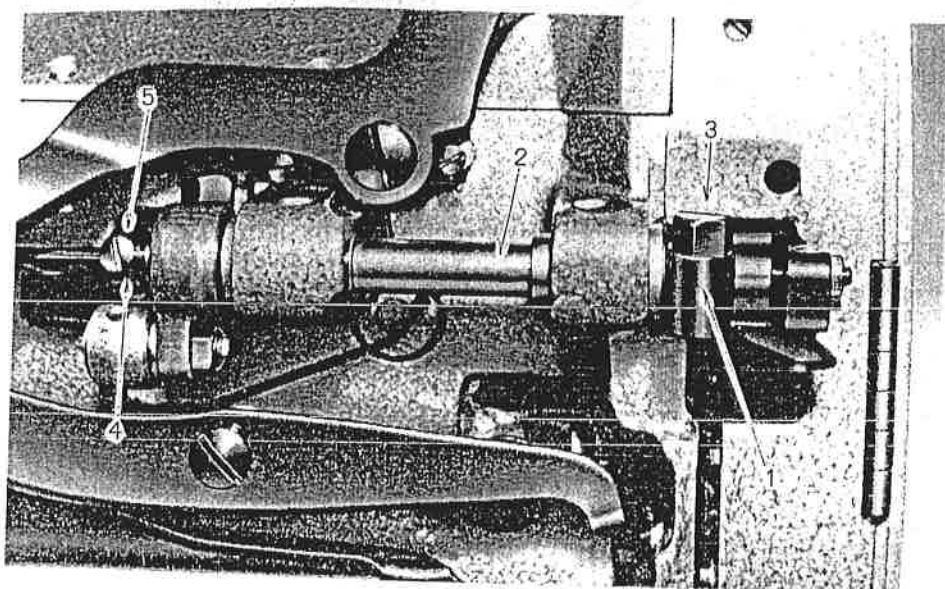


Fig. 36

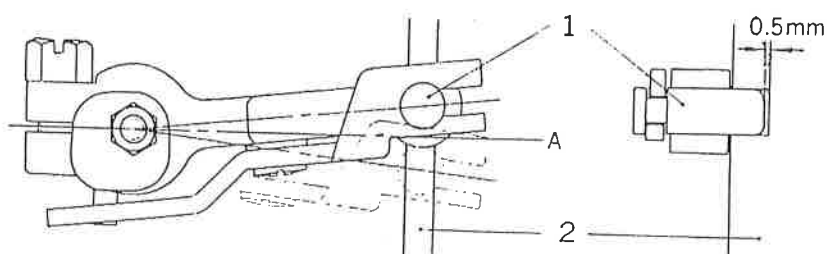


Fig. 37

TIMMING BETWEEN THE NEEDLE AND KNIFE

Normally, when the needle is at its lowest point, the knife should be at its highest point or vice versa.

This is due to the reason that the knife does not operate while the material is fed, and it cuts the material after the feeding motion.

To time this, loosen the two set screws (1), adjust the rotating position of the cam (2) faster or slower as may be required.

Then, tighten the cam set screws.

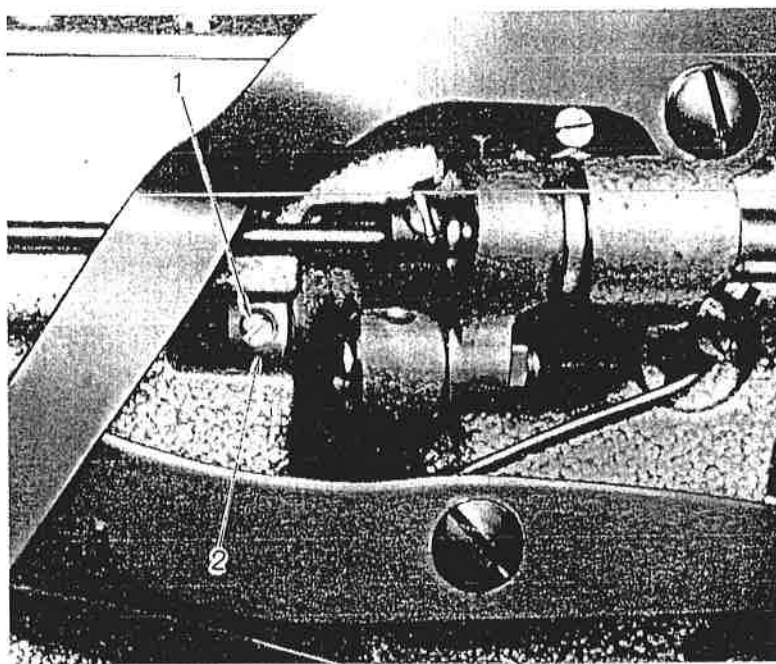


Fig. 38



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